付録1. 使用プログラム

[L13型]

そのまま記載している。

MAIN
Sub. DISCUS
Sub. TEST

[L2T型]

MAINはその時だが，DISCUSは $\alpha=+0.2$ の場合である。TEACHもそのままで，TESTはL13型と同じであるが，変数は設定に狭わわがならない。

MAIN
Sub. TEACH
Sub. DISCUS

[L1T型]

MAINはL2T型に同じ．TEACHはL2T型のを $\beta=1$ とする。DISCUSはその時。TESTはL13型に同じ。

sub. DISCUS

[L3T型]

MAINはL2T型に同じ。TEACHはL2型のを．$\beta=0$ とする。DISCUSはその時。TESTはL13型に同じ

sub. DISCUS

[L1A型]

L1T型から[先生]にあたる部分削除して乱数入力部分付加するが，やり方は．L1T型と類似なので省略した。

[Delphi]

そのまま記載している

MAIN
sub. THINK

《注意》

これらのプログラムでは，Q，Sベクトル，M行列の元は，10倍して整数型を用いているので，実際には，小数第三位以下切捨てで演算している。

$$A1 = \begin{pmatrix} 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 \end{pmatrix}$$

$$A1' = \begin{pmatrix} 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 \\ 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 \end{pmatrix}$$

$$a1'' = \begin{pmatrix}
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 \\
1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00
\end{pmatrix}$$

$$a1''' = \begin{pmatrix}
0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 1.00 \\
1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 1.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00
\end{pmatrix}$$

$$a2 = \begin{pmatrix}
0.10 & 0.00 & 0.00 & 0.50 & 0.40 & 0.30 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.10 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.30 & 0.40 & 0.40 \\
0.00 & 0.00 & 0.20 & 0.00 & 0.00 & 0.20 & 0.50 & 0.20 & 0.00 & 0.00 \\
0.40 & 0.00 & 0.00 & 0.10 & 0.20 & 0.10 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.30 & 0.00 & 0.00 & 0.30 & 0.10 & 0.10 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.20 & 0.00 & 0.20 & 0.10 & 0.30 & 0.10 & 0.20 & 0.10 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.40 & 0.00 & 0.00 & 0.10 & 0.10 & 0.10 & 0.00 & 0.00 \\
0.00 & 0.20 & 0.20 & 0.00 & 0.00 & 0.10 & 0.20 & 0.10 & 0.30 & 0.10 \\
0.00 & 0.30 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.10 & 0.10 & 0.40 \\
0.00 & 0.40 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.10 & 0.20 & 0.10
\end{pmatrix}$$

$$a3 = \begin{pmatrix}
0.00 & 0.43 & 0.00 & 0.00 & 0.00 & 0.11 & 0.03 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.17 & 0.00 & 0.00 & 0.00 & 0.03 & 0.02 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.09 & 0.00 & 0.00 & 0.15 & 0.20 & 0.00 & 0.29 & 0.00 \\
0.00 & 0.42 & 0.00 & 0.00 & 0.65 & 0.00 & 0.00 & 0.00 & 0.33 & 0.52 \\
0.06 & 0.03 & 0.33 & 0.00 & 0.00 & 0.17 & 0.39 & 0.44 & 0.08 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.26 & 0.14 & 0.30 & 0.00 & 0.14 & 0.31 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.13 & 0.04 & 0.00 & 0.00 & 0.39 & 0.00 & 0.00 \\
0.20 & 0.00 & 0.33 & 0.00 & 0.00 & 0.00 & 0.32 & 0.00 & 0.00 & 0.48 \\
0.34 & 0.00 & 0.00 & 0.35 & 0.00 & 0.27 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.39 & 0.12 & 0.09 & 0.00 & 0.17 & 0.00 & 0.03 & 0.00 & 0.00 & 0.00
\end{pmatrix}$$

$$a4 = \begin{pmatrix}
0.00 & 0.01 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.30 & 0.30 & 0.00 \\
0.00 & 0.01 & 0.04 & 0.16 & 0.01 & 0.48 & 0.36 & 0.00 & 0.00 & 0.17 \\
0.49 & 0.00 & 0.04 & 0.00 & 0.00 & 0.26 & 0.00 & 0.00 & 0.00 & 0.56 \\
0.00 & 0.51 & 0.15 & 0.00 & 0.00 & 0.09 & 0.35 & 0.08 & 0.26 & 0.00 \\
0.00 & 0.00 & 0.31 & 0.00 & 0.00 & 0.10 & 0.10 & 0.00 & 0.26 & 0.00 \\
0.16 & 0.48 & 0.00 & 0.01 & 0.48 & 0.01 & 0.00 & 0.31 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.33 & 0.65 & 0.04 & 0.00 & 0.11 & 0.02 & 0.02 & 0.14 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.08 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.02 & 0.16 & 0.14 \\
0.35 & 0.00 & 0.13 & 0.18 & 0.48 & 0.06 & 0.00 & 0.26 & 0.00 & 0.00
\end{pmatrix}$$

$$a5 = \begin{pmatrix}
0.50 & 0.00 & 0.15 & 0.00 & 0.11 & 0.00 & 0.03 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.50 & 0.00 & 0.19 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.50 & 0.00 & 0.17 & 0.00 & 0.00 & 0.09 & 0.23 & 0.00 \\
0.00 & 0.09 & 0.00 & 0.50 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.27 \\
0.07 & 0.00 & 0.00 & 0.00 & 0.50 & 0.07 & 0.19 & 0.41 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.50 & 0.00 & 0.00 & 0.00 & 0.23 \\
0.19 & 0.00 & 0.35 & 0.00 & 0.07 & 0.32 & 0.50 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.25 & 0.00 & 0.31 & 0.00 & 0.00 & 0.00 & 0.50 & 0.02 & 0.00 \\
0.24 & 0.00 & 0.00 & 0.00 & 0.11 & 0.01 & 0.27 & 0.00 & 0.50 & 0.00 \\
0.00 & 0.16 & 0.00 & 0.00 & 0.00 & 0.11 & 0.01 & 0.00 & 0.25 & 0.50
\end{pmatrix}$$

2

$$a6 = \begin{pmatrix}
0.00 & 0.00 & 0.00 & 0.05 & 0.35 & 0.35 & 0.00 & 0.33 & 0.00 & 0.13 \\
0.00 & 0.00 & 0.00 & 0.29 & 0.00 & 0.25 & 0.03 & 0.00 & 0.32 & 0.23 \\
0.00 & 0.00 & 0.00 & 0.53 & 0.07 & 0.00 & 0.00 & 0.00 & 0.00 & 0.27 \\
0.00 & 0.40 & 0.17 & 0.13 & 0.00 & 0.13 & 0.00 & 0.49 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.18 & 0.00 & 0.00 & 0.00 & 0.00 & 0.23 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.11 & 0.14 & 0.05 & 0.00 & 0.39 & 0.14 \\
0.00 & 0.17 & 0.60 & 0.00 & 0.00 & 0.13 & 0.00 & 0.00 & 0.29 & 0.00 \\
0.54 & 0.43 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.25 & 0.00 & 0.23 & 0.00 & 0.00 & 0.00 & 0.00 & 0.18 & 0.00 & 0.00 \\
0.21 & 0.00 & 0.00 & 0.00 & 0.29 & 0.00 & 0.92 & 0.00 & 0.00 & 0.00
\end{pmatrix}$$

$$a6' = \begin{pmatrix}
0.00 & 0.00 & 0.00 & 0.05 & 0.00 & 0.33 & 0.35 & 0.35 & 0.00 & 0.13 \\
0.00 & 0.00 & 0.00 & 0.29 & 0.03 & 0.00 & 0.00 & 0.25 & 0.32 & 0.23 \\
0.00 & 0.00 & 0.00 & 0.53 & 0.00 & 0.00 & 0.07 & 0.00 & 0.00 & 0.27 \\
0.00 & 0.40 & 0.17 & 0.13 & 0.00 & 0.49 & 0.00 & 0.13 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.18 & 0.00 & 0.00 & 0.23 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.05 & 0.00 & 0.11 & 0.14 & 0.39 & 0.14 \\
0.00 & 0.17 & 0.60 & 0.00 & 0.00 & 0.00 & 0.00 & 0.13 & 0.29 & 0.00 \\
0.54 & 0.43 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.25 & 0.00 & 0.23 & 0.00 & 0.00 & 0.18 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.21 & 0.00 & 0.00 & 0.00 & 0.92 & 0.00 & 0.29 & 0.00 & 0.00 & 0.00
\end{pmatrix}$$

$$a7 = \begin{pmatrix}
0.00 & 0.10 & 0.20 & 0.00 & 0.10 & 0.00 & 0.00 & 0.00 & 0.10 & 0.00 \\
0.30 & 0.00 & 0.10 & 0.20 & 0.00 & 0.10 & 0.10 & 0.10 & 0.10 & 0.10 \\
0.10 & 0.10 & 0.10 & 0.00 & 0.00 & 0.10 & 0.20 & 0.30 & 0.20 & 0.10 \\
0.20 & 0.00 & 0.00 & 0.10 & 0.10 & 0.00 & 0.10 & 0.10 & 0.10 & 0.00 \\
0.10 & 0.30 & 0.10 & 0.10 & 0.00 & 0.10 & 0.10 & 0.20 & 0.00 & 0.30 \\
0.10 & 0.10 & 0.10 & 0.10 & 0.00 & 0.11 & 0.10 & 0.10 & 0.30 & 0.00 \\
0.00 & 0.10 & 0.00 & 0.10 & 0.30 & 0.20 & 0.00 & 0.10 & 0.00 & 0.10 \\
0.10 & 0.20 & 0.00 & 0.10 & 0.20 & 0.10 & 0.10 & 0.00 & 0.10 & 0.10 \\
0.00 & 0.10 & 0.10 & 0.00 & 0.10 & 0.30 & 0.30 & 0.10 & 0.00 & 0.20 \\
0.10 & 0.00 & 0.30 & 0.30 & 0.10 & 0.10 & 0.00 & 0.00 & 0.10 & 0.10
\end{pmatrix}$$

$$b1 = \begin{pmatrix}
0.10 & 0.17 & 0.32 & 0.07 & 0.02 & 0.03 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.09 & 0.01 & 0.23 & 0.13 & 0.01 & 0.03 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.52 & 0.60 & 0.01 & 0.23 & 0.06 & 0.05 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.14 & 0.09 & 0.35 & 0.05 & 0.29 & 0.04 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.06 & 0.05 & 0.03 & 0.39 & 0.03 & 0.55 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.04 & 0.03 & 0.01 & 0.07 & 0.15 & 0.06 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.30 & 0.12 & 0.99 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.06 & 0.01 & 0.00 & 0.99 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.01 & 0.02 & 0.00 & 0.00 & 0.99 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.01 & 0.03 & 0.00 & 0.00 & 0.00 & 0.99
\end{pmatrix}$$

$$b2 = \begin{pmatrix}
0.99 & 0.00 & 0.00 & 0.00 & 0.02 & 0.03 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.99 & 0.00 & 0.00 & 0.01 & 0.03 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.99 & 0.00 & 0.06 & 0.05 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.99 & 0.29 & 0.04 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.03 & 0.55 & 0.23 & 0.05 & 0.03 & 0.03 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.15 & 0.06 & 0.05 & 0.01 & 0.03 & 0.02 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.30 & 0.12 & 0.04 & 0.28 & 0.11 & 0.14 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.06 & 0.01 & 0.33 & 0.02 & 0.53 & 0.58 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.01 & 0.02 & 0.15 & 0.21 & 0.08 & 0.11 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.01 & 0.03 & 0.17 & 0.37 & 0.17 & 0.08
\end{pmatrix}$$

$$b3 = \begin{pmatrix}
0.13 & 0.17 & 0.31 & 0.10 & 0.08 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.09 & 0.04 & 0.24 & 0.15 & 0.02 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.52 & 0.59 & 0.01 & 0.23 & 0.21 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.14 & 0.09 & 0.35 & 0.06 & 0.59 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.07 & 0.06 & 0.04 & 0.40 & 0.04 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.99 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.99 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.99 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.99 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.99
\end{pmatrix}$$

$$b4 = \begin{pmatrix}
0.99 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.99 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.99 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.99 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.99 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.11 & 0.11 & 0.02 & 0.04 & 0.03 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.67 & 0.67 & 0.27 & 0.10 & 0.14 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.04 & 0.04 & 0.03 & 0.55 & 0.59 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.05 & 0.05 & 0.21 & 0.11 & 0.12 \\
0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.07 & 0.07 & 0.41 & 0.15 & 0.08
\end{pmatrix}$$

$$m7 = \begin{pmatrix}
0.07 & 0.05 & 0.20 & 0.08 & 0.08 & 0.09 & 0.05 & 0.04 & 0.02 & 0.06 \\
0.14 & 0.08 & 0.24 & 0.13 & 0.08 & 0.09 & 0.04 & 0.02 & 0.04 & 0.04 \\
0.14 & 0.45 & 0.01 & 0.14 & 0.13 & 0.04 & 0.04 & 0.02 & 0.08 & 0.06 \\
0.01 & 0.19 & 0.25 & 0.01 & 0.07 & 0.15 & 0.11 & 0.04 & 0.10 & 0.06 \\
0.10 & 0.01 & 0.08 & 0.10 & 0.11 & 0.03 & 0.17 & 0.01 & 0.11 & 0.12 \\
0.18 & 0.06 & 0.02 & 0.21 & 0.16 & 0.05 & 0.12 & 0.05 & 0.01 & 0.08 \\
0.14 & 0.01 & 0.02 & 0.09 & 0.14 & 0.26 & 0.02 & 0.26 & 0.08 & 0.03 \\
0.13 & 0.01 & 0.06 & 0.11 & 0.01 & 0.19 & 0.26 & 0.06 & 0.40 & 0.37 \\
0.03 & 0.06 & 0.04 & 0.03 & 0.06 & 0.05 & 0.10 & 0.20 & 0.03 & 0.07 \\
0.01 & 0.03 & 0.02 & 0.05 & 0.11 & 0.01 & 0.04 & 0.25 & 0.08 & 0.05
\end{pmatrix}$$

$$m8 = \begin{pmatrix}
0.08 & 0.10 & 0.18 & 0.13 & 0.01 & 0.05 & 0.02 & 0.00 & 0.08 & 0.08 \\
0.16 & 0.09 & 0.12 & 0.15 & 0.03 & 0.10 & 0.04 & 0.06 & 0.07 & 0.01 \\
0.31 & 0.43 & 0.11 & 0.24 & 0.04 & 0.19 & 0.06 & 0.05 & 0.02 & 0.06 \\
0.13 & 0.01 & 0.25 & 0.01 & 0.23 & 0.02 & 0.06 & 0.13 & 0.10 & 0.03 \\
0.07 & 0.03 & 0.05 & 0.23 & 0.05 & 0.14 & 0.26 & 0.05 & 0.06 & 0.00 \\
0.06 & 0.09 & 0.08 & 0.06 & 0.23 & 0.01 & 0.07 & 0.10 & 0.05 & 0.03 \\
0.06 & 0.06 & 0.11 & 0.02 & 0.25 & 0.20 & 0.07 & 0.10 & 0.02 & 0.12 \\
0.01 & 0.03 & 0.05 & 0.05 & 0.05 & 0.16 & 0.16 & 0.06 & 0.44 & 0.27 \\
0.01 & 0.04 & 0.01 & 0.00 & 0.05 & 0.06 & 0.11 & 0.22 & 0.06 & 0.27 \\
0.05 & 0.06 & 0.00 & 0.06 & 0.01 & 0.01 & 0.10 & 0.17 & 0.04 & 0.06
\end{pmatrix}$$

$$2P1 = \begin{bmatrix} 0.09 & 0.14 & 0.30 & 0.03 & 0.02 & 0.03 & 0.02 & 0.01 & 0.01 & 0.01 \\ 0.08 & 0.01 & 0.22 & 0.11 & 0.01 & 0.03 & 0.03 & 0.00 & 0.00 & 0.01 \\ 0.51 & 0.59 & 0.00 & 0.21 & 0.06 & 0.05 & 0.04 & 0.01 & 0.02 & 0.02 \\ 0.13 & 0.08 & 0.34 & 0.04 & 0.29 & 0.04 & 0.07 & 0.01 & 0.05 & 0.03 \\ 0.06 & 0.05 & 0.03 & 0.39 & 0.03 & 0.55 & 0.23 & 0.05 & 0.03 & 0.03 \\ 0.04 & 0.03 & 0.01 & 0.07 & 0.15 & 0.06 & 0.05 & 0.01 & 0.03 & 0.02 \\ 0.01 & 0.03 & 0.02 & 0.04 & 0.30 & 0.12 & 0.02 & 0.27 & 0.10 & 0.13 \\ 0.01 & 0.00 & 0.01 & 0.02 & 0.06 & 0.01 & 0.30 & 0.02 & 0.53 & 0.57 \\ 0.01 & 0.01 & 0.01 & 0.02 & 0.01 & 0.02 & 0.11 & 0.20 & 0.06 & 0.09 \\ 0.01 & 0.01 & 0.01 & 0.01 & 0.01 & 0.03 & 0.10 & 0.36 & 0.12 & 0.05 \end{bmatrix}$$

$$2P2 = \begin{bmatrix} 0.07 & 0.10 & 0.17 & 0.08 & 0.03 & 0.02 & 0.00 & 0.01 & 0.00 & 0.01 \\ 0.19 & 0.05 & 0.21 & 0.11 & 0.01 & 0.02 & 0.02 & 0.01 & 0.01 & 0.01 \\ 0.41 & 0.60 & 0.01 & 0.21 & 0.04 & 0.01 & 0.03 & 0.02 & 0.01 & 0.01 \\ 0.14 & 0.09 & 0.42 & 0.02 & 0.18 & 0.11 & 0.07 & 0.04 & 0.02 & 0.04 \\ 0.03 & 0.03 & 0.06 & 0.42 & 0.03 & 0.60 & 0.37 & 0.09 & 0.02 & 0.06 \\ 0.06 & 0.02 & 0.02 & 0.06 & 0.32 & 0.05 & 0.03 & 0.04 & 0.04 & 0.01 \\ 0.02 & 0.04 & 0.05 & 0.02 & 0.22 & 0.04 & 0.04 & 0.38 & 0.09 & 0.12 \\ 0.01 & 0.01 & 0.01 & 0.01 & 0.08 & 0.03 & 0.33 & 0.03 & 0.57 & 0.63 \\ 0.01 & 0.00 & 0.01 & 0.00 & 0.02 & 0.02 & 0.03 & 0.17 & 0.03 & 0.04 \\ 0.01 & 0.01 & 0.00 & 0.00 & 0.01 & 0.03 & 0.03 & 0.17 & 0.18 & 0.01 \end{bmatrix}$$

$$2P3 = \begin{bmatrix} 0.07 & 0.07 & 0.29 & 0.07 & 0.04 & 0.01 & 0.02 & 0.01 & 0.01 & 0.02 \\ 0.05 & 0.04 & 0.35 & 0.06 & 0.02 & 0.02 & 0.03 & 0.00 & 0.01 & 0.02 \\ 0.69 & 0.57 & 0.02 & 0.37 & 0.06 & 0.06 & 0.01 & 0.01 & 0.01 & 0.01 \\ 0.07 & 0.16 & 0.13 & 0.01 & 0.12 & 0.05 & 0.11 & 0.02 & 0.01 & 0.04 \\ 0.02 & 0.03 & 0.09 & 0.19 & 0.03 & 0.60 & 0.41 & 0.04 & 0.04 & 0.05 \\ 0.01 & 0.02 & 0.02 & 0.10 & 0.36 & 0.03 & 0.05 & 0.02 & 0.02 & 0.04 \\ 0.03 & 0.04 & 0.03 & 0.12 & 0.22 & 0.12 & 0.03 & 0.32 & 0.14 & 0.21 \\ 0.01 & 0.01 & 0.01 & 0.01 & 0.06 & 0.04 & 0.13 & 0.02 & 0.65 & 0.34 \\ 0.00 & 0.00 & 0.00 & 0.02 & 0.03 & 0.01 & 0.07 & 0.20 & 0.02 & 0.16 \\ 0.00 & 0.00 & 0.01 & 0.01 & 0.02 & 0.01 & 0.09 & 0.30 & 0.05 & 0.06 \end{bmatrix}$$

$$2P4 = \begin{bmatrix} 0.06 & 0.20 & 0.29 & 0.07 & 0.02 & 0.02 & 0.01 & 0.01 & 0.02 & 0.01 \\ 0.08 & 0.05 & 0.13 & 0.04 & 0.04 & 0.03 & 0.01 & 0.00 & 0.01 & 0.02 \\ 0.54 & 0.37 & 0.03 & 0.17 & 0.04 & 0.04 & 0.01 & 0.01 & 0.02 & 0.02 \\ 0.12 & 0.19 & 0.33 & 0.06 & 0.20 & 0.10 & 0.03 & 0.01 & 0.01 & 0.06 \\ 0.06 & 0.04 & 0.08 & 0.29 & 0.03 & 0.46 & 0.13 & 0.05 & 0.10 & 0.10 \\ 0.02 & 0.02 & 0.04 & 0.13 & 0.16 & 0.06 & 0.10 & 0.02 & 0.03 & 0.04 \\ 0.03 & 0.03 & 0.02 & 0.13 & 0.38 & 0.12 & 0.05 & 0.20 & 0.10 & 0.11 \\ 0.02 & 0.03 & 0.03 & 0.03 & 0.05 & 0.06 & 0.48 & 0.02 & 0.39 & 0.39 \\ 0.01 & 0.01 & 0.00 & 0.01 & 0.02 & 0.03 & 0.06 & 0.31 & 0.05 & 0.09 \\ 0.01 & 0.01 & 0.01 & 0.01 & 0.02 & 0.04 & 0.06 & 0.33 & 0.23 & 0.11 \end{bmatrix}$$

$$2P5 = \begin{bmatrix} 0.02 & 0.10 & 0.21 & 0.12 & 0.01 & 0.02 & 0.01 & 0.00 & 0.00 & 0.01 \\ 0.12 & 0.05 & 0.27 & 0.10 & 0.04 & 0.02 & 0.01 & 0.01 & 0.00 & 0.02 \\ 0.57 & 0.36 & 0.01 & 0.17 & 0.10 & 0.05 & 0.04 & 0.01 & 0.01 & 0.01 \\ 0.09 & 0.23 & 0.31 & 0.02 & 0.11 & 0.14 & 0.04 & 0.01 & 0.04 & 0.02 \\ 0.04 & 0.05 & 0.09 & 0.35 & 0.03 & 0.43 & 0.15 & 0.03 & 0.11 & 0.08 \\ 0.05 & 0.03 & 0.02 & 0.07 & 0.37 & 0.08 & 0.08 & 0.04 & 0.02 & 0.02 \\ 0.01 & 0.05 & 0.02 & 0.07 & 0.20 & 0.14 & 0.04 & 0.25 & 0.24 & 0.07 \\ 0.02 & 0.05 & 0.00 & 0.03 & 0.07 & 0.03 & 0.42 & 0.01 & 0.39 & 0.39 \\ 0.02 & 0.01 & 0.01 & 0.01 & 0.01 & 0.02 & 0.07 & 0.34 & 0.05 & 0.24 \\ 0.01 & 0.01 & 0.00 & 0.01 & 0.03 & 0.02 & 0.10 & 0.23 & 0.08 & 0.10 \end{bmatrix}$$

$$zm1 = \begin{pmatrix} 0.05 & 0.01 & 0.20 & 0.02 & 0.06 & 0.00 & 0.03 & 0.02 & 0.00 & 0.02 \\ 0.00 & 0.05 & 0.26 & 0.00 & 0.09 & 0.03 & 0.00 & 0.02 & 0.00 & 0.00 \\ 0.64 & 0.57 & 0.00 & 0.20 & 0.01 & 0.03 & 0.03 & 0.02 & 0.00 & 0.00 \\ 0.02 & 0.24 & 0.36 & 0.05 & 0.24 & 0.00 & 0.21 & 0.00 & 0.00 & 0.00 \\ 0.13 & 0.04 & 0.00 & 0.64 & 0.00 & 0.76 & 0.13 & 0.04 & 0.07 & 0.00 \\ 0.00 & 0.01 & 0.07 & 0.01 & 0.37 & 0.06 & 0.13 & 0.01 & 0.00 & 0.04 \\ 0.05 & 0.02 & 0.02 & 0.00 & 0.08 & 0.00 & 0.13 & 0.39 & 0.15 & 0.00 \\ 0.00 & 0.00 & 0.03 & 0.00 & 0.03 & 0.04 & 0.01 & 0.10 & 0.69 & 0.21 \\ 0.05 & 0.01 & 0.03 & 0.05 & 0.00 & 0.03 & 0.22 & 0.10 & 0.00 & 0.48 \\ 0.02 & 0.01 & 0.00 & 0.00 & 0.06 & 0.02 & 0.05 & 0.24 & 0.05 & 0.21 \end{pmatrix}$$

$$zm2 = \begin{pmatrix} 0.00 & 0.18 & 0.25 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.01 & 0.03 \\ 0.36 & 0.01 & 0.44 & 0.06 & 0.00 & 0.05 & 0.00 & 0.05 & 0.00 & 0.01 \\ 0.37 & 0.38 & 0.00 & 0.62 & 0.02 & 0.09 & 0.00 & 0.06 & 0.00 & 0.00 \\ 0.03 & 0.23 & 0.13 & 0.00 & 0.27 & 0.36 & 0.05 & 0.13 & 0.08 & 0.02 \\ 0.00 & 0.15 & 0.11 & 0.18 & 0.00 & 0.16 & 0.42 & 0.00 & 0.01 & 0.03 \\ 0.06 & 0.01 & 0.00 & 0.03 & 0.16 & 0.05 & 0.06 & 0.11 & 0.13 & 0.12 \\ 0.08 & 0.00 & 0.04 & 0.03 & 0.47 & 0.13 & 0.02 & 0.55 & 0.59 & 0.02 \\ 0.01 & 0.00 & 0.00 & 0.04 & 0.04 & 0.00 & 0.40 & 0.00 & 0.11 & 0.65 \\ 0.03 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.05 & 0.03 & 0.06 \\ 0.01 & 0.01 & 0.00 & 0.00 & 0.00 & 0.13 & 0.00 & 0.00 & 0.00 & 0.02 \end{pmatrix}$$

$$zm3 = \begin{pmatrix} 0.04 & 0.33 & 0.49 & 0.03 & 0.00 & 0.00 & 0.05 & 0.00 & 0.00 & 0.00 \\ 0.08 & 0.11 & 0.21 & 0.02 & 0.00 & 0.04 & 0.00 & 0.01 & 0.00 & 0.00 \\ 0.08 & 0.08 & 0.06 & 0.20 & 0.00 & 0.09 & 0.11 & 0.04 & 0.00 & 0.00 \\ 0.09 & 0.25 & 0.00 & 0.00 & 0.67 & 0.00 & 0.00 & 0.03 & 0.11 & 0.02 \\ 0.29 & 0.14 & 0.11 & 0.24 & 0.07 & 0.70 & 0.00 & 0.02 & 0.13 & 0.02 \\ 0.02 & 0.01 & 0.00 & 0.01 & 0.00 & 0.07 & 0.49 & 0.00 & 0.01 & 0.05 \\ 0.09 & 0.01 & 0.00 & 0.26 & 0.20 & 0.02 & 0.01 & 0.71 & 0.06 & 0.11 \\ 0.03 & 0.02 & 0.05 & 0.13 & 0.00 & 0.03 & 0.01 & 0.07 & 0.63 & 0.57 \\ 0.12 & 0.00 & 0.00 & 0.07 & 0.00 & 0.02 & 0.04 & 0.00 & 0.00 & 0.14 \\ 0.10 & 0.00 & 0.03 & 0.00 & 0.02 & 0.00 & 0.25 & 0.08 & 0.03 & 0.04 \end{pmatrix}$$

$$zm4 = \begin{pmatrix} 0.15 & 0.00 & 0.55 & 0.25 & 0.00 & 0.03 & 0.03 & 0.01 & 0.01 & 0.01 \\ 0.15 & 0.11 & 0.00 & 0.26 & 0.02 & 0.05 & 0.01 & 0.00 & 0.01 & 0.06 \\ 0.20 & 0.64 & 0.09 & 0.05 & 0.06 & 0.02 & 0.02 & 0.01 & 0.00 & 0.06 \\ 0.17 & 0.08 & 0.17 & 0.05 & 0.07 & 0.07 & 0.03 & 0.04 & 0.00 & 0.00 \\ 0.16 & 0.00 & 0.00 & 0.14 & 0.04 & 0.51 & 0.42 & 0.01 & 0.09 & 0.06 \\ 0.06 & 0.05 & 0.02 & 0.16 & 0.40 & 0.07 & 0.03 & 0.00 & 0.00 & 0.00 \\ 0.07 & 0.06 & 0.09 & 0.01 & 0.30 & 0.20 & 0.00 & 0.19 & 0.03 & 0.40 \\ 0.00 & 0.00 & 0.00 & 0.02 & 0.02 & 0.01 & 0.37 & 0.04 & 0.54 & 0.01 \\ 0.00 & 0.01 & 0.01 & 0.00 & 0.04 & 0.00 & 0.05 & 0.46 & 0.10 & 0.14 \\ 0.00 & 0.00 & 0.03 & 0.01 & 0.00 & 0.01 & 0.00 & 0.20 & 0.19 & 0.22 \end{pmatrix}$$

$$zm5 = \begin{pmatrix} 0.00 & 0.01 & 0.11 & 0.01 & 0.04 & 0.00 & 0.00 & 0.01 & 0.00 & 0.09 \\ 0.21 & 0.02 & 0.73 & 0.20 & 0.00 & 0.00 & 0.00 & 0.00 & 0.02 & 0.00 \\ 0.36 & 0.14 & 0.08 & 0.00 & 0.07 & 0.30 & 0.01 & 0.01 & 0.05 & 0.12 \\ 0.32 & 0.69 & 0.05 & 0.05 & 0.15 & 0.21 & 0.02 & 0.01 & 0.00 & 0.05 \\ 0.03 & 0.03 & 0.00 & 0.48 & 0.02 & 0.00 & 0.10 & 0.14 & 0.00 & 0.03 \\ 0.00 & 0.01 & 0.00 & 0.11 & 0.00 & 0.00 & 0.18 & 0.00 & 0.00 & 0.01 \\ 0.01 & 0.01 & 0.00 & 0.08 & 0.56 & 0.32 & 0.01 & 0.11 & 0.01 & 0.05 \\ 0.01 & 0.00 & 0.00 & 0.00 & 0.08 & 0.12 & 0.42 & 0.04 & 0.74 & 0.53 \\ 0.00 & 0.01 & 0.00 & 0.01 & 0.00 & 0.01 & 0.02 & 0.03 & 0.13 & 0.08 \\ 0.01 & 0.02 & 0.00 & 0.03 & 0.03 & 0.00 & 0.19 & 0.62 & 0.01 & 0.00 \end{pmatrix}$$

$$zm6 = \begin{pmatrix} 0.24 & 0.10 & 0.55 & 0.06 & 0.00 & 0.05 & 0.05 & 0.00 & 0.02 & 0.02 \\ 0.16 & 0.00 & 0.06 & 0.06 & 0.00 & 0.01 & 0.04 & 0.01 & 0.01 & 0.01 \\ 0.00 & 0.49 & 0.03 & 0.34 & 0.06 & 0.02 & 0.09 & 0.00 & 0.00 & 0.00 \\ 0.08 & 0.11 & 0.02 & 0.06 & 0.63 & 0.06 & 0.00 & 0.02 & 0.03 & 0.00 \\ 0.27 & 0.13 & 0.25 & 0.34 & 0.00 & 0.01 & 0.57 & 0.12 & 0.16 & 0.05 \\ 0.04 & 0.05 & 0.00 & 0.07 & 0.16 & 0.03 & 0.00 & 0.03 & 0.00 & 0.00 \\ 0.08 & 0.03 & 0.06 & 0.00 & 0.00 & 0.67 & 0.03 & 0.24 & 0.10 & 0.20 \\ 0.04 & 0.01 & 0.00 & 0.02 & 0.01 & 0.02 & 0.11 & 0.02 & 0.43 & 0.62 \\ 0.02 & 0.01 & 0.01 & 0.00 & 0.05 & 0.02 & 0.02 & 0.02 & 0.09 & 0.01 \\ 0.03 & 0.02 & 0.00 & 0.01 & 0.05 & 0.06 & 0.04 & 0.50 & 0.12 & 0.06 \end{pmatrix}$$

$$zm7 = \begin{pmatrix} 0.04 & 0.01 & 0.22 & 0.05 & 0.05 & 0.05 & 0.02 & 0.00 & 0.00 & 0.02 \\ 0.15 & 0.02 & 0.33 & 0.13 & 0.06 & 0.05 & 0.01 & 0.00 & 0.01 & 0.01 \\ 0.15 & 0.78 & 0.00 & 0.15 & 0.14 & 0.01 & 0.01 & 0.00 & 0.03 & 0.01 \\ 0.00 & 0.13 & 0.35 & 0.00 & 0.04 & 0.14 & 0.08 & 0.01 & 0.05 & 0.02 \\ 0.08 & 0.00 & 0.04 & 0.08 & 0.10 & 0.00 & 0.20 & 0.00 & 0.06 & 0.08 \\ 0.25 & 0.01 & 0.00 & 0.34 & 0.24 & 0.01 & 0.10 & 0.01 & 0.00 & 0.04 \\ 0.14 & 0.00 & 0.00 & 0.07 & 0.17 & 0.43 & 0.00 & 0.36 & 0.03 & 0.00 \\ 0.14 & 0.00 & 0.02 & 0.10 & 0.00 & 0.23 & 0.45 & 0.02 & 0.76 & 0.74 \\ 0.01 & 0.01 & 0.01 & 0.01 & 0.03 & 0.02 & 0.07 & 0.21 & 0.00 & 0.02 \\ 0.00 & 0.00 & 0.00 & 0.02 & 0.11 & 0.00 & 0.01 & 0.35 & 0.03 & 0.01 \end{pmatrix}$$

$$zm8 = \begin{pmatrix} 0.03 & 0.04 & 0.21 & 0.11 & 0.00 & 0.02 & 0.00 & 0.00 & 0.03 & 0.03 \\ 0.16 & 0.04 & 0.09 & 0.13 & 0.00 & 0.07 & 0.01 & 0.02 & 0.02 & 0.00 \\ 0.57 & 0.81 & 0.08 & 0.36 & 0.00 & 0.24 & 0.03 & 0.02 & 0.00 & 0.02 \\ 0.10 & 0.00 & 0.43 & 0.00 & 0.29 & 0.00 & 0.02 & 0.13 & 0.04 & 0.00 \\ 0.03 & 0.00 & 0.01 & 0.31 & 0.01 & 0.14 & 0.48 & 0.02 & 0.01 & 0.00 \\ 0.02 & 0.03 & 0.04 & 0.02 & 0.29 & 0.00 & 0.03 & 0.08 & 0.01 & 0.00 \\ 0.02 & 0.02 & 0.08 & 0.00 & 0.34 & 0.28 & 0.04 & 0.08 & 0.00 & 0.08 \\ 0.00 & 0.00 & 0.01 & 0.01 & 0.01 & 0.18 & 0.18 & 0.02 & 0.83 & 0.41 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.01 & 0.03 & 0.09 & 0.36 & 0.02 & 0.39 \\ 0.01 & 0.02 & 0.00 & 0.02 & 0.00 & 0.00 & 0.07 & 0.23 & 0.00 & 0.02 \end{pmatrix}$$

$$zm9 = \begin{pmatrix} 0.00 & 0.05 & 0.03 & 0.05 & 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.06 \\ 0.01 & 0.06 & 0.30 & 0.13 & 0.01 & 0.03 & 0.00 & 0.11 & 0.01 & 0.02 \\ 0.69 & 0.70 & 0.07 & 0.18 & 0.13 & 0.00 & 0.02 & 0.00 & 0.00 & 0.01 \\ 0.20 & 0.10 & 0.35 & 0.05 & 0.34 & 0.05 & 0.00 & 0.00 & 0.00 & 0.07 \\ 0.00 & 0.00 & 0.02 & 0.04 & 0.04 & 0.79 & 0.51 & 0.02 & 0.00 & 0.16 \\ 0.01 & 0.01 & 0.08 & 0.31 & 0.01 & 0.03 & 0.02 & 0.09 & 0.03 & 0.05 \\ 0.03 & 0.02 & 0.01 & 0.00 & 0.38 & 0.00 & 0.05 & 0.00 & 0.18 & 0.05 \\ 0.01 & 0.00 & 0.06 & 0.12 & 0.00 & 0.03 & 0.19 & 0.02 & 0.73 & 0.02 \\ 0.01 & 0.01 & 0.04 & 0.03 & 0.00 & 0.01 & 0.06 & 0.67 & 0.00 & 0.31 \\ 0.01 & 0.00 & 0.00 & 0.04 & 0.05 & 0.01 & 0.10 & 0.05 & 0.02 & 0.21 \end{pmatrix}$$

$$zm10 = \begin{pmatrix} 0.02 & 0.08 & 0.02 & 0.16 & 0.00 & 0.06 & 0.02 & 0.01 & 0.03 & 0.02 \\ 0.25 & 0.01 & 0.05 & 0.01 & 0.00 & 0.02 & 0.00 & 0.02 & 0.03 & 0.01 \\ 0.50 & 0.69 & 0.00 & 0.72 & 0.08 & 0.09 & 0.09 & 0.00 & 0.00 & 0.01 \\ 0.01 & 0.11 & 0.58 & 0.01 & 0.48 & 0.11 & 0.11 & 0.09 & 0.08 & 0.04 \\ 0.11 & 0.00 & 0.07 & 0.03 & 0.01 & 0.01 & 0.02 & 0.13 & 0.00 & 0.00 \\ 0.07 & 0.02 & 0.11 & 0.01 & 0.26 & 0.00 & 0.08 & 0.02 & 0.00 & 0.02 \\ 0.00 & 0.01 & 0.09 & 0.00 & 0.05 & 0.46 & 0.00 & 0.49 & 0.11 & 0.08 \\ 0.00 & 0.02 & 0.00 & 0.01 & 0.07 & 0.00 & 0.35 & 0.05 & 0.68 & 0.66 \\ 0.00 & 0.00 & 0.00 & 0.00 & 0.00 & 0.10 & 0.21 & 0.01 & 0.03 & 0.00 \\ 0.00 & 0.01 & 0.00 & 0.02 & 0.00 & 0.11 & 0.06 & 0.13 & 0.00 & 0.10 \end{pmatrix}$$

思考過程の数学的表現と模擬実験.

中所武司

Mathematical Expression of Thinking Process and Computer Simulation

By Takeshi CHUSHO

It seems that functions of consciousness and association in thinking process are essential. Therefore the former having concentric operation is expressed as a power function and the latter having diffusible operation , as a linear function. So a thinking model has been designed so that a state vector is alternately transformed by these functions. Primely useing this model the expressions of personality and mental condition, and analysis of aphasia have been attacked. Next , computer simulations of the learning process in the various discussuons , the growing course of the thinking process and the predicting process by Delphi method , have been pursued.

Unfortunately the first attempts have not reached to the satisfying results , however the second have given successful results.

L1T#

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      INTEGER A(10,10),B(10,10),PA(10),PB(10),QA(10),QB(10),C(10,10)
      DIMENSION MA(10),MB(10),JAB(40),JAC(40),JQA(40),JEA(40),IFM(4),JFM
     1(4),LFM(4)
      CX=1.0/ALOG(2.0)
      CY=ALOG(100.0)
      DO 280 LL=1,10
      IST=10
      KLAB=1000
      KLAC=1000
      KIQA=1000
      READ(5,201)B,A
  201 FORMAT(20I2)
      DO 291 I=1,10
      DO 292 J=1,10
  292 C(I,J)=A(I,J)
  291 CONTINUE
      CALL TESTB(B)
      WRITE(6,209)
  209 FORMAT(1H ,33HLEARNED MATRIX B OF THE DIFFUSION)
      DO 80 I=1,10
      WRITE(6,210)(B(I,J),J=1,10)
  210 FORMAT(1H ,10I4)
   80 CONTINUE
      DO 290 ML=1,10
      WRITE(6,207)
  207 FORMAT(1H ,33HLEARNED MATRIX A OF THE DIFFUSION)
      DO 75 I=1,10
      WRITE(6,208) (A(I,J),J=1,10)
  208 FORMAT(1H ,10I4)
   75 CONTINUE
C     TEST A AND B BY L03
      LAB=0
      LAC=0
      IQA=0
      ALE=0.0
      DO 293 I=2,10
      DO 294 J=1,I-1
      LAB=LAB+(A(I,J)-B(I,J))**2
      LAC=LAC+(A(I,J)-C(I,J))**2
      IQA=IQA+A(I,J)**2
      IF(A(I,J).NE.0) ALE=ALE+FLOAT(A(I,J))*CX*(CY-ALOG(FLOAT(A(I,J))))
      K=11-I
      L=11-J
      LAB=LAB+(A(K,L)-B(K,L))**2
      LAC=LAC+(A(K,L)-C(K,L))**2
      IQA=IQA+A(K,L)**2
      IF(A(K,L).NE.0) ALE=ALE+FLOAT(A(K,L))*CX*(CY-ALOG(FLOAT(A(K,L))))
  294 CONTINUE
  293 CONTINUE
      LAB=SQRT(FLOAT(LAB))
      LAC=SQRT(FLOAT(LAC))
      IQA=SQRT(FLOAT(IQA))
      JAB(ML)=LAB
      JAC(ML)=LAC
      JQA(ML)=IQA
      JEA(ML)=ALE
      IF(LAB.NE.KLAB) GO TO 281
      IF(IQA.NE.KIQA) GO TO 281
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      IF(LAC.NE.KLAC) GO TO 281
      IST=ML
      GO TO 282
  281 CONTINUE
      KLAB=LAB
      KLAC=LAC
      KIQA=IQA
      CALL TESTA(A)
C     DISCUSSION MTL10303
      DO 60 L=1,10
      DO 65 I=1,10
      PA(I)=0
      PB(I)=0
      QA(I)=0
      QB(I)=0
      MA(I)=0
      MB(I)=0
   65 CONTINUE
      PB(L)=100
      MB(L)=3
      QB(L)=100
      DO 70 N=1,10
      CALL DISCB(A,PA,PB,QA,MA)
      CALL TEACH(B,PB,PA,QB,MB)
   70 CONTINUE
   60 CONTINUE
  290 CONTINUE
  282 CONTINUE
      WRITE(6,203)
  203 FORMAT(1H1,10X,2HAB,8X,2HAA,8X,2HQA,8X,2HEA)
      DO 296 I=1,IST
      WRITE(6,202) I,JAB(I),JAC(I),JQA(I),JEA(I)
  202 FORMAT(1H ,I2,4(I10))
  296 CONTINUE
      DO 295 I=1,IST
      MAB=JAB(I)/4
      MAC=JAC(I)/4
      MEA=JEA(I)/25
      IF(MAB.EQ.0) MAB=1
      IF(MAC.EQ.0) MAC=1
      IF(MEA.EQ.0) MEA=1
      IF(MAB.GT.120) MAB=120
      IF(MAC.GT.120) MAC=120
      IF(MEA.GT.120) MEA=120
      IFM(1)=5H(1H ,
      IFM(2)=IBTOD(MAB)
      IFM(3)=2HX,
      IFM(4)=4H1H*)
      WRITE(6,IFM)
      JFM(1)=5H(1H+,
      JFM(2)=IBTOD(MAC)
      JFM(3)=2HX,
      JFM(4)=4H1HA)
      WRITE(6,JFM)
      LFM(1)=5H(1H+,
      LFM(2)=IBTOD(MEA)
      LFM(3)=2HX,
      LFM(4)=4H1HX)
```

```
      WRITE(6,LFM)
  295 CONTINUE
  280 CONTINUE
      STOP
      END
```

VARIABLE LL APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

VARIABLE N APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTEI

```
      SUBROUTINE DISCB(A,PA,PB,Q,M)
      INTEGER A(10,10),PA(10),PB(10),Q(10),S(10),T
      DIMENSION M(10)
         DO 11 I=1,10
      IF(M(I).EQ.3) GO TO 31
      S(I)=0
      DO 12 J=1,10
   12 S(I)=S(I)+A(I,J)*(Q(J)+PB(J))
      IF(M(I).EQ.2) GO TO 33
      M(I)=0
      GO TO 32
   31 S(I)=0
      M(I)=2
      PA(I)=0
      GO TO 32
   33 S(I)=S(I)/2
      M(I)=1
   32 CONTINUE
   11 CONTINUE
      T=0
      DO 13 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   13 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 39
      DO 14 I=1,10
      Q(I)=10*S(I)/T
      MT=T
      IF(Q(I).LT.50) GO TO 34
      Q(I)=100
      M(I)=3
      PA(I)=100
      DO16 J=1,10
      IF(M(J).EQ.2) GO TO 36
      GO TO 38
   36 A(I,J)=A(I,J)+2
      T=0
      DO 350 KA=1,10
  350 T=T+A(KA,J)
      DO 355 KA=1,10
  355 A(KA,J)=A(KA,J)*100/T
   38 CONTINUE
   16 CONTINUE
   34 CONTINUE
      T=MT
   14 CONTINUE
      GO TO 41
   39 DO 17 I=1,10
   17 Q(I)=0
   41 RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      SUBROUTINE TEACH(A,PA,PB,Q,M)
      INTEGER A(10,10),PA(10),PB(10),Q(10),S(10),T
      DIMENSION M(10)
      DO 411 I=1,10
      IF(M(I).EQ.3) GO TO 431
      S(I)=0
      DO 412 J=1,10
C.....,.....NEXT VARIABLE.....
  412 S(I)=S(I)+A(I,J)*(Q(J)+PB(J))
      IF(M(I).EQ.2) GO TO 433
      M(I)=0
      GO TO 432
  431 S(I)=0
      M(I)=2
      PA(I)=0
      GO TO 432
  433 S(I)=S(I)/2
      M(I)=1
  432 CONTINUE
  411 CONTINUE
      T=0
      DO 413 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
  413 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 439
      DO 414 I=1,10
      Q(I)=10*S(I)/T
      MT=T
      IF(Q(I).LT.50)GO TO 434
      Q(I)=100
      M(I)=3
      PA(I)=100
  434 CONTINUE
      T=MT
  414 CONTINUE
      GO TO 441
  439 DO 417 I=1,10
  417 Q(I)=0
  441 RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTER

```
      SUBROUTINE TESTA(A)
C     TEST BY T03
      INTEGER A(10,10),Q(10),S(10),T
      DIMENSION M(10),ME(10)
      DO 87 I=1,10
   87 ME(I)=0
      DO 85 MM=1,10
      DO 90 J=1,10
      M(J)=0
      Q(J)=0
   90 CONTINUE
      Q(MM)=100
      DO  81 N=1,10
      DO 82 I=1,10
      IF(M(I).EQ.3) GO TO 71
      S(I)=0
      DO 83 J=1,10
      S(I)=S(I)+A(I,J)*Q(J)
   83 CONTINUE
      IF(M(I).EQ.2) GO TO 72
      GO TO 73
   71 S(I)=0
      M(I)=2
      GO TO 73
   72 S(I)=S(I)/2
   73 CONTINUE
   82 CONTINUE
      T=0
      DO 84 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   84 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 85
      DO 86 I=1,10
      Q(I)=10*S(I)/T
      IF(Q(I).LT.50)GO TO 74
      Q(I)=100
      M(I)=3
      IF(I.EQ.MM) GO TO 74
      ME(MM)=100*N+I
      GO TO 85
   74 CONTINUE
   86 CONTINUE
   81 CONTINUE
   85 CONTINUE
      WRITE(6,300) ME
  300 FORMAT(1H ,33X,7HANSWER=,10I4)
      RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTER

```
      SUBROUTINE TESTB(A)
C     TEST BY T03
      INTEGER A(10,10),Q(10),S(10),T
      DIMENSION M(10),ME(10)
      DO 87 I=1,10
   87 ME(I)=0
      DO 85 MM=1,10
      DO 90 J=1,10
      M(J)=0
      Q(J)=0
   90 CONTINUE
      Q(MM)=100
      DO  81 N=1,10
      DO 82 I=1,10
      IF(M(I).EQ.3) GO TO 71
      S(I)=0
      DO 83 J=1,10
      S(I)=S(I)+A(I,J)*Q(J)
   83 CONTINUE
      IF(M(I).EQ.2) GO TO 72
      GO TO 73
   71 S(I)=0
      M(I)=2
      GO TO 73
   72 S(I)=S(I)/2
   73 CONTINUE
   82 CONTINUE
      T=0
      DO 84 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   84 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 85
      DO 86 I=1,10
      Q(I)=10*S(I)/T
      IF(Q(I).LT.50)GO TO 74
      Q(I)=100
      M(I)=3
      IF(I.EQ.MM) GO TO 74
      ME(MM)=100*N+I
      GO TO 85
   74 CONTINUE
   86 CONTINUE
   81 CONTINUE
   85 CONTINUE
      WRITE(6,300) ME
  300 FORMAT(1H ,33X,7HANSWER=,10I4)
      RETURN
      END
```

(127型)

HARP 5020 COMPILED LIST

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
C-FROM BOY TO YOUTH BY MAN-----
      INTEGER A(10,10),B(10,10),PA(10),PB(10),QA(10),QB(10),C(10,10)
      DIMENSION MA(10),MB(10),JAB(40),JAC(40),JQA(40),JEA(40),IFM(4),JFM
     1(4),LFM(4)
      CX=1.0/ALOG(2.0)
      CY=ALOG(100.0)
      DO 280 LL=1,10
      IST=40
      KLAB=1000
      AALE=4000.0
      KIQA=1000
      READ(5,201)B,A
  201 FORMAT(20I2)
      DO 291 I=1,10
      DO 292 J=1,10
  292 C(I,J)=A(I,J)
  291 CONTINUE
      CALL TESTB(B)
      WRITE(6,209)
  209 FORMAT(1H ,33HLEARNED MATRIX B OF THE DIFFUSION)
      DO 80 I=1,10
      WRITE(6,210)(B(I,J),J=1,10)
  210 FORMAT(1H ,10I4)
   80 CONTINUE
      DO 290 ML=1,40
      WRITE(6,207)
  207 FORMAT(1H ,33HLEARNED MATRIX A OF THE DIFFUSION)
      DO 75 I=1,10
      WRITE(6,208) (A(I,J),J=1,10)
  208 FORMAT(1H ,10I4)
   75 CONTINUE
C     TEST A AND B BY L03
      LAB=0
      LAC=0
      IQA=0
      ALE=0.0
      DO 293 I=2,10
      DO 294 J=1,I-1
      LAB=LAB+(A(I,J)-B(I,J))**2
      LAC=LAC+(A(I,J)-C(I,J))**2
      IQA=IQA+A(I,J)**2
      IF(A(I,J).NE.0) ALE=ALE+FLOAT(A(I,J))*CX*(CY-ALOG(FLOAT(A(I,J))))
      K=11-I
      L=11-J
      LAB=LAB+(A(K,L)-B(K,L))**2
      LAC=LAC+(A(K,L)-C(K,L))**2
      IQA=IQA+A(K,L)**2
      IF(A(K,L).NE.0) ALE=ALE+FLOAT(A(K,L))*CX*(CY-ALOG(FLOAT(A(K,L))))
  294 CONTINUE
  293 CONTINUE
      LAB=SQRT(FLOAT(LAB))
      LAC=SQRT(FLOAT(LAC))
      IQA=SQRT(FLOAT(IQA))
      JAB(ML)=LAB
      JAC(ML)=LAC
      JQA(ML)=IQA
      JEA(ML)=ALE
      IF(LAB.NE.KLAB) GO TO 281
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      IF(IQA.NE.KIQA) GO TO 281
      IF(ALE.NE.AALE) GO TO 281
      IST=ML
      GO TO 282
  281 CONTINUE
      KLAB=LAB
      AALE=ALE
      KIQA=IQA
      CALL TESTA(A)
C     DISCUSSION MTL10303
      DO 60 L=1,10
      DO 65 I=1,10
      PA(I)=0
      PB(I)=0
      QA(I)=0
      QB(I)=0
      MA(I)=0
      MB(I)=0
   65 CONTINUE
      PB(L)=100
      MB(L)=3
      QB(L)=100
      DO 70 N=1,10
      CALL DISCB(A,PA,PB,QA,MA)
      CALL TEACH(B,PB,PA,QB,MB)
   70 CONTINUE
   60 CONTINUE
  290 CONTINUE
  282 CONTINUE
      WRITE(6,203)
  203 FORMAT(1H1,10X,2HAB,8X,2HAA,8X,2HQA,8X,2HEA)
      DO 296 I=1,IST
      WRITE(6,202) I,JAB(I),JAC(I),JQA(I),JEA(I)
  202 FORMAT(1H ,I2,4(I10))
  296 CONTINUE
      DO 295 I=1,IST
      MAB=JAB(I)/4
      MAC=JQA(I)/3
      MEA=JEA(I)/25
      IF(MAB.EQ.0) MAB=1
      IF(MAC.EQ.0) MAC=1
      IF(MEA.EQ.0) MEA=1
      IF(MEA.GT.119) MEA=119
      IF(MAC.GT.119) MAC=119
      IF(MAB.GT.119) MAB=119
      IFM(1)=5H(1H ,
      IFM(2)=IBTOD(MAB)
      IFM(3)=2HX,
      IFM(4)=4H1H*)
      WRITE(6,IFM)
      JFM(1)=5H(1H+,
      JFM(2)=IBTOD(MAC)
      JFM(3)=2HX,
      JFM(4)=4H1HA)
      WRITE(6,JFM)
      LFM(1)=5H(1H+,
      LFM(2)=IBTOD(MEA)
      LFM(3)=2HX,
```

HARP 5020 COMPILED LIST

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      LFM(4)=4H1HX)
      WRITE(6,LFM)
  295 CONTINUE
  280 CONTINUE
      STOP
      END
```

VARIABLE LL APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

VARIABLE N APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      SUBROUTINE TEACH(A,PA,PB,Q,M)
      INTEGER A(10,10),PA(10),PB(10),Q(10),S(10),T
      DIMENSION M(10)
      DO 411 I=1,10
      IF(M(I).EQ.3) GO TO 431
      S(I)=0
      DO 412 J=1,10
C.....NEXT VARIABLE.....
  412 S(I)=S(I)+A(I,J)*PB(J)
      IF(M(I).EQ.2) GO TO 433
      M(I)=0
      GO TO 432
  431 S(I)=0
      M(I)=2
      PA(I)=0
      GO TO 432
  433 S(I)=S(I)/2
      M(I)=1
  432 CONTINUE
  411 CONTINUE
      T=0
      DO 413 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
  413 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 439
      DO 414 I=1,10
      Q(I)=10*S(I)/T
      MT=T
      IF(Q(I).LT.50)GO TO 434
      Q(I)=100
      M(I)=3
      PA(I)=100
  434 CONTINUE
      T=MT
  414 CONTINUE
      GO TO 441
  439 DO 417 I=1,10
  417 Q(I)=0
  441 RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      SUBROUTINE TESTA(A)
C     TEST BY T03
      INTEGER A(10,10),Q(10),S(10),T
      DIMENSION M(10),ME(10)
      DO 87 I=1,10
   87 ME(I)=0
      DO 85 MM=1,10
      DO 90 J=1,10
      M(J)=0
      Q(J)=0
   90 CONTINUE
      Q(MM)=100
      DO  81 N=1,10
      DO 82 I=1,10
      IF(M(I).EQ.3) GO TO 71
      S(I)=0
      DO 83 J=1,10
      S(I)=S(I)+A(I,J)*Q(J)
   83 CONTINUE
      IF(M(I).EQ.2) GO TO 72
      GO TO 73
   71 S(I)=0
      M(I)=2
      GO TO 73
   72 S(I)=S(I)/2
   73 CONTINUE
   82 CONTINUE
      T=0
      DO 84 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   84 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 85
      DO 86 I=1,10
      Q(I)=10*S(I)/T
      IF(Q(I).LT.50) GO TO74
      Q(I)=100
      M(I)=3
      IF(I.EQ.MM) GO TO 74
      ME(MM)=100*N+I
      GO TO 85
   74 CONTINUE
   86 CONTINUE
   81 CONTINUE
   85 CONTINUE
      WRITE(6,300) ME
  300 FORMAT(1H ,33X,7HANSWER=,10I4)
      RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      SUBROUTINE TESTB(A)
C     TEST BY T03
      INTEGER A(10,10),Q(10),S(10),T
      DIMENSION M(10),ME(10)
      DO 87 I=1,10
   87 ME(I)=0
      DO 85 MM=1,10
      DO 90 J=1,10
      M(J)=0
      Q(J)=0
   90 CONTINUE
      Q(MM)=100
      DO  81 N=1,10
      DO 82 I=1,10
      IF(M(I).EQ.3) GO TO 71
      S(I)=0
      DO 83 J=1,10
      S(I)=S(I)+A(I,J)*Q(J)
   83 CONTINUE
      IF(M(I).EQ.2) GO TO 72
      GO TO 73
   71 S(I)=0
      M(I)=2
      GO TO 73
   72 S(I)=S(I)/2
   73 CONTINUE
   82 CONTINUE
      T=0
      DO 84 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   84 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 85
      DO 86 I=1,10
      Q(I)=10*S(I)/T
      IF(Q(I).LT.50)GO TO 74
      Q(I)=100
      M(I)=3
      IF(I.EQ.MM) GO TO 74
      ME(MM)=100*N+I
      GO TO 85
   74 CONTINUE
   86 CONTINUE
   81 CONTINUE
   85 CONTINUE
      WRITE(6,300) ME
  300 FORMAT(1H ,33X,7HANSWER=,10I4)
      RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      SUBROUTINE DISCB(A,PA,PB,Q,M)
      INTEGER A(10,10),PA(10),PB(10),Q(10),S(10),T
      DIMENSION M(10)
      DO 30 I=1,10
      IF(M(I).EQ.3) GO TO 1
      S(I)=0
      DO 35 J=1,10
C.....NEXT VARIABLE.....
   35 S(I)=S(I)+A(I,J)*(Q(J)+3*PB(J))
      IF(M(I).EQ.2) GO TO 2
      M(I)=0
      GO TO 3
    1 DO 180 J=1,10
      IF(PB(J).NE.100)GO TO 180
C.....NEXT VARIABLE.....
      A(J,I)=A(J,I)+2
      T=0
      DO 185 KA=1,10
      T=T+A(KA,I)
  185 CONTINUE
      DO 190 KA=1,10
      A(KA,I)=A(KA,I)*100/T
  190 CONTINUE
      GO TO 90
  180 CONTINUE
   90 S(I)=0
      M(I)=2
      PA(I)=0
      GO TO 3
    2 S(I)=S(I)/2
      M(I)=1
    3 CONTINUE
   30 CONTINUE
      T=0
      DO 40 I=1,10
C.....NEXT VARIABLE.....
      S(I)=S(I)**2/10
      T=T+S(I)
   40 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 9
      DO 45 I=1,10
      Q(I)=10*S(I)/T
      MT=T
C.....NEXT VARIABLE.....
      IF(Q(I).LT.50)GO TO 4
      Q(I)=100
      PA(I)=100
      M(I)=3
    4 CONTINUE
      T=MT
   45 CONTINUE
      GO TO 95
    9 DO 199 I=1,10
  199 Q(I)=0
   95 CONTINUE
      RETURN
      END
```

(L3T型)

```
HARP  5020   COMPILED  LIST          L3TEACHER

          EXTERNAL FORMULA NUMBER    -     SOURCE STATEMENT     -     INTER

C-FROM BOY TO YOUTH BY TEACHER-----
      INTEGER A(10,10),B(10,10),PA(10),PB(10),QA(10),QB(10),C(10,10)
      DIMENSION MA(10),MB(10),JAB(40),JAC(40),JQA(40),JEA(40),IFM(4),JFM
     1(4),LFM(4)
      CX=1.0/ALOG(2.0)
      CY=ALOG(100.0)
      DO 280 LL=1,10
      IST=10
      KLAB=1000
      KLAC=1000
      KIQA=1000
      READ(5,201)B,A
  201 FORMAT(20I2)
      DO 291 I=1,10
      DO 292 J=1,10
  292 C(I,J)=A(I,J)
  291 CONTINUE
      CALL TESTB(B)
      WRITE(6,209)
  209 FORMAT(1H ,33HLEARNED MATRIX B OF THE DIFFUSION)
      DO 80 I=1,10
      WRITE(6,210)(B(I,J),J=1,10)
  210 FORMAT(1H ,10I4)
   80 CONTINUE
      DO 290 ML=1,10
      WRITE(6,207)
  207 FORMAT(1H ,33HLEARNED MATRIX A OF THE DIFFUSION)
      DO 75 I=1,10
      WRITE(6,208) (A(I,J),J=1,10)
  208 FORMAT(1H ,10I4)
   75 CONTINUE
C     TEST A AND B BY L03
      LAB=0
      LAC=0
      IQA=0
      ALE=0.0
      DO 293 I=2,10
      DO 294 J=1,I-1
      LAB=LAB+(A(I,J)-B(I,J))**2
      LAC=LAC+(A(I,J)-C(I,J))**2
      IQA=IQA+A(I,J)**2
      IF(A(I,J).NE.0) ALE=ALE+FLOAT(A(I,J))*CX*(CY-ALOG(FLOAT(A(I,J))))
      K=11-I
      L=11-J
      LAB=LAB+(A(K,L)-B(K,L))**2
      LAC=LAC+(A(K,L)-C(K,L))**2
      IQA=IQA+A(K,L)**2
      IF(A(K,L).NE.0) ALE=ALE+FLOAT(A(K,L))*CX*(CY-ALOG(FLOAT(A(K,L))))
  294 CONTINUE
  293 CONTINUE
      LAB=SQRT(FLOAT(LAB))
      LAC=SQRT(FLOAT(LAC))
      IQA=SQRT(FLOAT(IQA))
      JAB(ML)=LAB
      JAC(ML)=LAC
      JQA(ML)=IQA
      JEA(ML)=ALE
      IF(LAB.NE.KLAB) GO TO 281
```

```
      IF(IQA.NE.KIQA) GO TO 281
      IF(LAC.NE.KLAC) GO TO 281
      IST=ML
      GO TO 282
  281 CONTINUE
      KLAB=LAB
      KLAC=LAC
      KIQA=IQA
      CALL TESTA(A)
C     DISCUSSION MTL10303
      DO 60 L=1,10
      DO 65 I=1,10
      PA(I)=0
      PB(I)=0
      QA(I)=0
      QB(I)=0
      MA(I)=0
      MB(I)=0
   65 CONTINUE
      PB(L)=100
      MB(L)=3
      QB(L)=100
      LX=0
      DO 70 N=1,10
      CALL DISCUS(A,PA,PB,QA,MA,LX)
      CALL TEACH(B,PB,PA,QB,MB)
   70 CONTINUE
   60 CONTINUE
  290 CONTINUE
  282 CONTINUE
      WRITE(6,203)
  203 FORMAT(1H1,10X,2HAB,8X,2HAA,8X,2HQA,8X,2HEA)
      DO 296 I=1,IST
      WRITE(6,202) I,JAB(I),JAC(I),JQA(I),JEA(I)
  202 FORMAT(1H ,I2,4(I10))
  296 CONTINUE
      DO 295 I=1,IST
      MAB=JAB(I)/4
      MAC=JAC(I)/4
      MEA=JEA(I)/25
      IF(MAB.EQ.0) MAB=1
      IF(MAC.EQ.0) MAC=1
      IF(MEA.EQ.0) MEA=1
      IF(MAB.GT.120) MAB=120
      IF(MAC.GT.120) MAC=120
      IF(MEA.GT.120) MEA=120
      IFM(1)=5H(1H ,
      IFM(2)=IBTOD(MAB)
      IFM(3)=2HX,
      IFM(4)=4H1H*)
      WRITE(6,IFM)
      JFM(1)=5H(1H+,
      JFM(2)=IBTOD(MAC)
      JFM(3)=2HX,
      JFM(4)=4H1HA)
      WRITE(6,JFM)
      LFM(1)=5H(1H+,
      LFM(2)=IBTOD(MEA)
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTER

```
      LFM(3)=2HX,
      LFM(4)=4H1HX)
      WRITE(6,LFM)
  295 CONTINUE
  280 CONTINUE
      STOP
      END
```

VARIABLE LL APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

VARIABLE N APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

```
      SUBROUTINE TEACH(A,PA,PB,Q,M)
      INTEGER A(10,10),PA(10),PB(10),Q(10),S(10),T
      DIMENSION M(10)
      DO 411 I=1,10
      IF(M(I).EQ.3) GO TO 431
      S(I)=0
      DO 412 J=1,10
C.....................NEXT VARIABLE.....
  412 S(I)=S(I)+A(I,J)*Q(J)
      IF(M(I).EQ.2) GO TO 433
      M(I)=0
      GO TO 432
  431 S(I)=0
      M(I)=2
      PA(I)=0
      GO TO 432
  433 S(I)=S(I)/2
      M(I)=1
  432 CONTINUE
  411 CONTINUE
      T=0
      DO 413 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
  413 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 439
      DO 414 I=1,10
      Q(I)=10*S(I)/T
      MT=T
      IF(Q(I).LT.50)GO TO 434
      Q(I)=100
      M(I)=3
      PA(I)=100
  434 CONTINUE
      T=MT
  414 CONTINUE
      GO TO 441
  439 DO 417 I=1,10
  417 Q(I)=0
  441 RETURN
      END
```

```
      SUBROUTINE DISCUS(A,PA,PB,Q,M,LX)
      INTEGER A(10,10),PA(10),PB(10),Q(10),S(10),T
      DIMENSION M(10)
      DO 601 I=1,10
      IF(PB(I).NE.100) GO TO 601
      IF(LX.EQ.0) GO TO 603
      J=LX
      A(I,J)=A(I,J)+2
      T=0
      DO 350 KA=1,10
  350 T=T+A(KA,J)
      DO 355 KA=1,10
  355 A(KA,J)=A(KA,J)*100/T
  603 LX=I
      GO TO 602
  601 CONTINUE
      LX=0
  602 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE TESTB(A)
C     TEST BY T03
      INTEGER A(10,10),Q(10),S(10),T
      DIMENSION M(10),ME(10)
      DO 87 I=1,10
   87 ME(I)=0
      DO 85 MM=1,10
      DO 90 J=1,10
      M(J)=0
      Q(J)=0
   90 CONTINUE
      Q(MM)=100
      DO  81 N=1,10
      DO 82 I=1,10
      IF(M(I).EQ.3) GO TO 71
      S(I)=0
      DO 83 J=1,10
      S(I)=S(I)+A(I,J)*Q(J)
   83 CONTINUE
      IF(M(I).EQ.2) GO TO 72
      GO TO 73
   71 S(I)=0
      M(I)=2
      GO TO 73
   72 S(I)=S(I)/2
   73 CONTINUE
   82 CONTINUE
      T=0
      DO 84 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   84 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 85
      DO 86 I=1,10
      Q(I)=10*S(I)/T
      IF(Q(I).LT.50)GO TO 74
      Q(I)=100
      M(I)=3
      IF(I.EQ.MM) GO TO 74
      ME(MM)=100*N+I
      GO TO 85
   74 CONTINUE
   86 CONTINUE
   81 CONTINUE
   85 CONTINUE
      WRITE(6,300) ME
  300 FORMAT(1H ,33X,7HANSWER=,10I4)
      RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTER

```
      SUBROUTINE TESTA(A)
C     TEST BY T03
      INTEGER A(10,10),Q(10),S(10),T
      DIMENSION M(10),ME(10)
      DO 87 I=1,10
   87 ME(I)=0
      DO 85 MM=1,10
      DO 90 J=1,10
      M(J)=0
      Q(J)=0
   90 CONTINUE
      Q(MM)=100
      DO  81 N=1,10
      DO 82 I=1,10
      IF(M(I).EQ.3) GO TO 71
      S(I)=0
      DO 83 J=1,10
      S(I)=S(I)+A(I,J)*Q(J)
   83 CONTINUE
      IF(M(I).EQ.2) GO TO 72
      GO TO 73
   71 S(I)=0
      M(I)=2
      GO TO 73
   72 S(I)=S(I)/2
   73 CONTINUE
   82 CONTINUE
      T=0
      DO 84 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   84 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 85
      DO 86 I=1,10
      Q(I)=10*S(I)/T
      IF(Q(I).LT.50)GO TO 74
      Q(I)=100
      M(I)=3
      IF(I.EQ.MM) GO TO 74
      ME(MM)=100*N+I
      GO TO 85
   74 CONTINUE
   86 CONTINUE
   81 CONTINUE
   85 CONTINUE
      WRITE(6,300) ME
  300 FORMAT(1H ,33X,7HANSWER=,10I4)
      RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTER

```
      SUBROUTINE TESTB(A)
C     TEST BY T03
      INTEGER A(10,10),Q(10),S(10),T
      DIMENSION M(10),ME(10)
      DO 87 I=1,10
   87 ME(I)=0
      DO 85 MM=1,10
      DO 90 J=1,10
      M(J)=0
      Q(J)=0
   90 CONTINUE
      Q(MM)=100
      DO  81 N=1,10
      DO 82 I=1,10
      IF(M(I).EQ.3) GO TO 71
      S(I)=0
      DO 83 J=1,10
      S(I)=S(I)+A(I,J)*Q(J)
   83 CONTINUE
      IF(M(I).EQ.2) GO TO 72
      GO TO 73
   71 S(I)=0
      M(I)=2
      GO TO 73
   72 S(I)=S(I)/2
   73 CONTINUE
   82 CONTINUE
      T=0
      DO 84 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   84 CONTINUE
      T=T/10
      IF(T,EQ.0) GO TO 85
      DO 86 I=1,10
      Q(I)=10*S(I)/T
      IF(Q(I).LT.50)GO TO 74
      Q(I)=100
      M(I)=3
      IF(I,EQ.MM) GO TO 74
      ME(MM)=100*N+I
      GO TO 85
   74 CONTINUE
   86 CONTINUE
   81 CONTINUE
   85 CONTINUE
      WRITE(6,300) ME
  300 FORMAT(1H ,33X,7HANSWER=,10I4)
      RETURN
      END
```

15L13L13

HARP 5020 COMPILED LIST DISL13L13

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
C-FROM YOUTH TO MAN BY FRIEND-----
      INTEGER A(10,10),B(10,10),PA(10),PB(10),QA(10),QB(10),C(10,10),D(1
     10,10)
      DIMENSION MA(10),MB(10),JAB(40),JAC(40),JBD(40),JQA(40),JQB(40),JE
     1A(40),JEB(40),IFM(4),JFM(4),KFM(4),LFM(4),MFM(4)
      CX=1.0/ALOG(2.0)
      CY=ALOG(100.0)
      DO 280 LL=1,10
      IST=10
      KLAB=1000
      KLAC=1000
      KLBD=1000
      KIQA=1000
      KIQB=1000
      READ(5,201) C,D
  201 FORMAT(20I2)
      DO 291 I=1,10
      DO 292 J=1,10
      A(I,J)=C(I,J)
      B(I,J)=D(I,J)
  292 CONTINUE
  291 CONTINUE
      DO 290 ML=1,10
      WRITE(6,207)
  207 FORMAT(1H ,33HLEARNED MATRIX A OF THE DIFFUSION,47X,33HLEARNED MAT
     1RIX B OF THE DIFFUSION)
      DO 75 I=1,10
      WRITE(6,208) (A(I,J),J=1,10),(B(I,J),J=1,10)
  208 FORMAT(1H ,10I4,40X,10I4)
   75 CONTINUE
C     TEST A AND B BY L03
      LAB=0
      LAC=0
      LBD=0
      IQA=0
      IQB=0
      BLE=0.0
      ALE=0.0
      DO 293 I=2,10
      DO 294 J=1,I-1
      LAB=LAB+(A(I,J)-B(I,J))**2
      LAC=LAC+(A(I,J)-C(I,J))**2
      LBD=LBD+(B(I,J)-D(I,J))**2
      IQA=IQA+A(I,J)**2
      IQB=IQB+B(I,J)**2
      IF(A(I,J).NE.0) ALE=ALE+FLOAT(A(I,J))*CX*(CY-ALOG(FLOAT(A(I,J))))
      IF(B(I,J).NE.0) BLE=BLE+FLOAT(B(I,J))*CX*(CY-ALOG(FLOAT(B(I,J))))
      K=11-I
      L=11-J
      LAB=LAB+(A(K,L)-B(K,L))**2
      LAC=LAC+(A(K,L)-C(K,L))**2
      LBD=LBD+(B(K,L)-D(K,L))**2
      IQA=IQA+A(K,L)**2
      IQB=IQB+B(K,L)**2
      IF(A(K,L).NE.0) ALE=ALE+FLOAT(A(K,L))*CX*(CY-ALOG(FLOAT(A(K,L))))
      IF(B(K,L).NE.0) BLE=BLE+FLOAT(B(K,L))*CX*(CY-ALOG(FLOAT(B(K,L))))
  294 CONTINUE
  293 CONTINUE
```

```
      LAB=SQRT(FLOAT(LAB))
      LAC=SQRT(FLOAT(LAC))
      LBD=SQRT(FLOAT(LBD))
      IQA=SQRT(FLOAT(IQA))
      IQB=SQRT(FLOAT(IQB))
      JAB(ML)=LAB
      JAC(ML)=LAC
      JBD(ML)=LBD
      JQA(ML)=IQA
      JQB(ML)=IQB
      JEA(ML)=ALE
      JEB(ML)=BLE
      IF(LAB.NE.KLAB) GO TO 281
      IF(IQA.NE.KIQA) GO TO 281
      IF(LAC.NE.KLAC) GO TO 281
      IF(LBD.NE.KLBD) GO TO 281
      IF(IQB.NE.KIQB) GO TO 281
      IST=ML
      GO TO 282
  281 CONTINUE
      KLAB=LAB
      KLAC=LAC
      KLBD=LBD
      KIQA=IQA
      KIQB=IQB
      CALL TESTA(A)
      CALL TESTA(B)
C     DISCUSSION MTL10303
      DO 60 L=1,10
      DO 65 I=1,10
      PA(I)=0
      PB(I)=0
      QA(I)=0
      QB(I)=0
      MA(I)=0
      MB(I)=0
   65 CONTINUE
      PB(L)=100
      MB(L)=3
      QB(L)=100
      LX=0
      LY=0
      LQX=0
      LQY=1
      DO 70 N=1,10
      CALL DISCA(A,PA,PB,QA,MA,LX,LQX)
      CALL DISCA(B,PB,PA,QB,MB,LY,LQY)
   70 CONTINUE
   60 CONTINUE
  290 CONTINUE
  282 CONTINUE
      WRITE(6,204)
  204 FORMAT(1H1,10X,2HAB,8X,2HAA,8X,2HBB,8X,2HQA,8X,2HQB,8X,2HEA,8X,2HE
     1B)
      DO 270 I=1,IST
      WRITE(6,202) I,JAB(I),JAC(I),JBD(I),JQA(I),JQB(I),JEA(I),JEB(I)
  202 FORMAT(1H ,I2,7(I10))
  270 CONTINUE
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      DO 295 I=1,IST
      MAB=JAB(I)/4
      MAC=JAC(I)/4
      MBD=JBD(I)/4
      MEA=JEA(I)/25
      MEB=JEB(I)/25
      IF(MAB.EQ.0) MAB=1
      IF(MAC.EQ.0) MAC=1
      IF(MBD.EQ.0) MBD=1
      IF(MEA.EQ.0) MEA=1
      IF(MEB.EQ.0) MEB=1
      IF(MAB.GT.120) MAB=120
      IF(MAC.GT.120) MAC=120
      IF(MBD.GT.120) MBD=120
      IF(MEA.GT.120) MEA=120
      IF(MEB.GT.120) MEB=120
      IFM(1)=5H(1H ,
      IFM(2)=IBTOD(MAB)
      IFM(3)=2HX,
      IFM(4)=4H1H*)
      WRITE(6,IFM)
      JFM(1)=5H(1H+,
      JFM(2)=IBTOD(MAC)
      JFM(3)=2HX,
      JFM(4)=4H1HA)
      WRITE(6,JFM)
      KFM(1)=5H(1H+,
      KFM(2)=IBTOD(MBD)
      KFM(3)=2HX,
      KFM(4)=4H1HB)
      WRITE(6,KFM)
      LFM(1)=5H(1H+,
      LFM(2)=IBTOD(MEA)
      LFM(3)=2HX,
      LFM(4)=4H1HX)
      WRITE(6,LFM)
      MFM(1)=5H(1H+,
      MFM(2)=IBTOD(MEB)
      MFM(3)=2HX,
      MFM(4)=4H1HY)
      WRITE(6,MFM)
  295 CONTINUE
  280 CONTINUE
      STOP
      END
```

VARIABLE LL APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

VARIABLE N APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      SUBROUTINE DISCA(A,PA,PB,Q,M,LX,LQ)
      INTEGER A(10,10),PA(10),PB(10),Q(10),S(10),T
      DIMENSION M(10)
      DO 601 I=1,10
      IF(PB(I).NE.100)GO TO 601
      J=LX
      LX=I
      IF(J.EQ.0) GO TO 602
      IF(LQ.EQ.1) GO TO 602
C-----LEARN-----
      A(I,J)=A(I,J)+2
      T=0
      DO 380 KA=1,10
  380 T=T+A(KA,J)
      DO 385 KA=1,10
  385 A(KA,J)=A(KA,J)*100/T
      GO TO 602
  601 CONTINUE
      LX=0
  602 CONTINUE
C-----A*(Q+P)-----
      DO 11 I=1,10
      IF(M(I).EQ.3) GO TO 31
      S(I)=0
      DO 12 J=1,10
      S(I)=S(I)+A(I,J)*(Q(J)+PB(J))
   12 CONTINUE
      IF(M(I).EQ.2) GO TO 33
      M(I)=0
      GO TO 32
   31 S(I)=0
      M(I)=2
      PA(I)=0
      GO TO 32
   33 S(I)=S(I)/2
      M(I)=1
   32 CONTINUE
   11 CONTINUE
C-----NEW Q------
      LQ=0
      T=0
      DO 13 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   13 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 39
      DO 14 I=1,10
      Q(I)=10*S(I)/T
      MT=T
      IF(Q(I).LT.50)GO TO 34
      Q(I)=100
      M(I)=3
      IF(I.EQ.LX) GO TO 34
      PA(I)=100
      LQ=1
      IF(LX.NE.0) GO TO 34
      DO 16 J=1,10
```

```
      IF(M(J).NE.2) GO TO 38
C-----LEARN-----
C.....NEXT VARIABLE.....
   36 A(I,J)=A(I,J)+2
      T=0
      DO 350 KA=1,10
  350 T=T+A(KA,J)
      DO 355 KA=1,10
  355 A(KA,J)=A(KA,J)*100/T
C.....NEXT VARIABLE.....
      A(J,I)=A(J,I)+1
      T=0
      DO 360 KA=1,10
  360 T=T+A(KA,I)
      DO 365 KA=1,10
  365 A(KA,I)=A(KA,I)*100/T
   38 CONTINUE
   16 CONTINUE
   34 CONTINUE
      T=MT
   14 CONTINUE
      GO TO 41
   39 DO 17 I=1,10
   17 Q(I)=0
   41 RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      SUBROUTINE TESTA(A)
C     TEST BY T03
      INTEGER A(10,10),Q(10),S(10),T
      DIMENSION M(10),ME(10)
      DO 87 I=1,10
   87 ME(I)=0
      DO 85 MM=1,10
      DO 90 J=1,10
      M(J)=0
      Q(J)=0
   90 CONTINUE
      Q(MM)=100
      DO  81 N=1,10
      DO 82 I=1,10
      IF(M(I).EQ.3) GO TO 71
      S(I)=0
      DO 83 J=1,10
      S(I)=S(I)+A(I,J)*Q(J)
   83 CONTINUE
      IF(M(I).EQ.2) GO TO 72
      GO TO 73
   71 S(I)=0
      M(I)=2
      GO TO 73
   72 S(I)=S(I)/2
   73 CONTINUE
   82 CONTINUE
      T=0
      DO 84 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   84 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 85
      DO 86 I=1,10
      Q(I)=10*S(I)/T
      IF(Q(I).LT.50)GO TO 74
      Q(I)=100
      M(I)=3
      IF(I.EQ.MM) GO TO 74
      ME(MM)=100*N+I
      GO TO 85
   74 CONTINUE
   86 CONTINUE
   81 CONTINUE
   85 CONTINUE
      WRITE(6,300) ME
  300 FORMAT(1H ,33X,7HANSWER=,10I4)
      RETURN
      END
```

```
      LML=10*L+100*ML-110
      WA=0
      DO 10 I=1,10
      KK=I+LML
      B(I)=RU(KK)**3
      WA=WA+B(I)
   10 CONTINUE
      WA=WA/200.0
      DO 11 I=1,10
      PB(I)=B(I)/WA
      QA(I)=PB(I)
   11 CONTINUE
      WRITE(6,100) L,PB
  100 FORMAT(1H ,9HSTIMULUS(,I1,2H(=,10I3)
C*****REFLECT ON HIMSELF*****
      DO 70 N=1,10
      CALL DISCB(A,QA,MA)
   70 CONTINUE
   60 CONTINUE
  290 CONTINUE
  282 CONTINUE
      WRITE(6,203)
  203 FORMAT(1H1,10X,          2HAA,8X,2HQA,8X,2HEA)
      DO 296 I=1,IST
      WRITE(6,202) I,        JAC(I),JQA(I),JEA(I)
  202 FORMAT(1H ,I2,3(I10))
  296 CONTINUE
      DO 295 I=1,IST
      MAC=JAC(I)/4
      MEA=JEA(I)/25
      IF(MAC.EQ.0) MAC=1
      IF(MEA.EQ.0) MEA=1
      IF(MAC.GT.120) MAC=120
      IF(MEA.GT.120) MEA=120
      JFM(1)=5H(1H ,
      JFM(2)=IBTOD(MAC)
      JFM(3)=2HX,
      JFM(4)=4H1HA)
      WRITE(6,JFM)
      LFM(1)=5H(1H+,
      LFM(2)=IBTOD(MEA)
      LFM(3)=2HX,
      LFM(4)=4H1HX)
      WRITE(6,LFM)
  295 CONTINUE
  280 CONTINUE
      STOP
      END
```

VARIABLE LL APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      SUBROUTINE DISCB(A,      Q,M)
      INTEGER A(10,10),              Q(10),S(10),T
      DIMENSION M(10)
         DO 11 I=1,10
      IF(M(I).EQ.3) GO TO 31
      S(I)=0
      DO 12 J=1,10
   12 S(I)=S(I)+A(I,J)*Q(J)
      IF(M(I).EQ.2) GO TO 33
      M(I)=0
      GO TO 32
   31 S(I)=0
      M(I)=2
      GO TO 32
   33 S(I)=S(I)/2
      M(I)=1
   32 CONTINUE
   11 CONTINUE
      T=0
      DO 13 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   13 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 39
      DO 14 I=1,10
      Q(I)=10*S(I)/T
      MT=T
      IF(Q(I).LT.50) GO TO 34
      M(I)=3
      DO16 J=1,10
      IF(M(J).EQ.2) GO TO 36
      IF(M(J).EQ.1) GO TO 37
      GO TO 38
   36 A(I,J)=A(I,J)+2
      T=0
      DO 350 KA=1,10
  350 T=T+A(KA,J)
      DO 355 KA=1,10
  355 A(KA,J)=A(KA,J)*100/T
      A(J,I)=A(J,I)+1
      T=0
      DO 360 KA=1,10
  360 T=T+A(KA,I)
      DO 365 KA=1,10
  365 A(KA,I)=A(KA,I)*100/T
      GO TO 38
   37 A(I,J)=A(I,J)+1
      T=0
      DO 370 KA=1,10
  370 T=T+A(KA,J)
      DO 375 KA=1,10
  375 A(KA,J)=A(KA,J)*100/T
   38 CONTINUE
   16 CONTINUE
   34 CONTINUE
      T=MT
   14 CONTINUE
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
      SUBROUTINE TESTA(A)
C     TEST BY T03
      INTEGER A(10,10),Q(10),S(10),T
      DIMENSION M(10),ME(10)
      DO 87 I=1,10
   87 ME(I)=0
      DO 85 MM=1,10
      DO 90 J=1,10
      M(J)=0
      Q(J)=0
   90 CONTINUE
      Q(MM)=100
      DO  81 N=1,10
      DO 82 I=1,10
      IF(M(I).EQ.3) GO TO 71
      S(I)=0
      DO 83 J=1,10
      S(I)=S(I)+A(I,J)*Q(J)
   83 CONTINUE
      IF(M(I).EQ.2) GO TO 72
      GO TO 73
   71 S(I)=0
      M(I)=2
      GO TO 73
   72 S(I)=S(I)/2
   73 CONTINUE
   82 CONTINUE
      T=0
      DO 84 I=1,10
      S(I)=S(I)**2/10
      T=T+S(I)
   84 CONTINUE
      T=T/10
      IF(T.EQ.0) GO TO 85
      DO 86 I=1,10
      Q(I)=10*S(I)/T
      IF(Q(I).LT.50)GO TO 74
      Q(I)=100
      M(I)=3
      IF(I.EQ.MM) GO TO 74
      ME(MM)=100*N+I
      GO TO 85
   74 CONTINUE
   86 CONTINUE
   81 CONTINUE
   85 CONTINUE
      WRITE(6,300) ME
  300 FORMAT(1H ,33X,7HANSWER=,10I4)
      RETURN
      END
```

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INTE

```
C37    G5/TC/RUN1 UNIFORM RANDOM NUMBER GENERATOR 1
C TITLE
C      UNIFORM RANDOM NUMBER GENERATOR 1
C PROGRAMMER
C      PROGRAMMED BY M.FUSHIMI AND K.FUJINO   1966-02-01
C PURPOSE
C      TO GENERATE RANDOM NUMBERS UNIFORMLY DISTRIBUTED BETWEEN 0.0 AND
C      1.0
C USAGE
C      CALLING SEQUENCE
C         CALL RUN1(IR,R)
C      ARGUMENTS
C         IR (SINGLE LENGTH INTEGER)
C              AT THE BEGINNING, ASSIGN A POSITIVE ODD INITIAL VALUE ONCE
C              AND ONLY ONCE
C         R (SINGLE PRECISION REAL NUMBER)
C            RETURNS WITH RANDOM NUMBER
C      SPECIAL INSTRUCTION
C         AT THE BEGINNING, ASSIGN A POSITIVE ODD INITIAL VALUE TO IR.
C         AFTERWARDS,YOU MUST NOT ASSIGN ANY VALUES, BECAUSE IT IS AUTO-
C         MATICALLY MODIFIED IN THIS SUBROUTINE.
       SUBROUTINE RUN1(IR,R)
       IR=IR*48828125
       R=FLOAT(IR)*0.4656613E-9
       RETURN
       END
```

alpha

Delphi

HARP 5020 COMPILED LIST DELFY

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INT

```
      DIMENSION LA(10,10,10),LP(10,10),LQ(10,10),LS(10,10),LT(10),LANS(
     10),LIN(10),MS(10),MQ(10),MP(10)
      DO 52 I=1,10
      DO 53 K=1,5
      KX=2*K-1
      KY=2*K
      READ(5,100) (LA(I,J,KX),J=1,10),(LA(I,J,KY),J=1,10)
  100 FORMAT(2(10I2))
   53 CONTINUE
   52 CONTINUE
      DO 54 I=1,5
      DO 55 J=1,10
      IX=2*I-1
      IY=2*I
      WRITE(6,105)(LA(IX,J,K),K=1,10),(LA(IY,J,K),K=1,10)
  105 FORMAT(1H ,10I4,10X,10I4)
   55 CONTINUE
      WRITE(6,106)
  106 FORMAT(1H ,41X,8HTAKECHAN)
   54 CONTINUE
      DO 10 KA=1,20
      DO 11 I=1,10
      DO 12 J=1,10
      LS(I,J)=0
   12 CONTINUE
      LT(I)=0
   11 CONTINUE
      READ(5,101) LIN
  101 FORMAT(10I1)
      WRITE(6,102) LIN
  102 FORMAT(1H1,7HABOUT (,10I2,2H ))
      WRITE(6,103)
  103 FORMAT(1H0,3X,7HOBJECT=,2X,1H1,2X,1H2,2X,1H3,2X,1H4,2X,1H5,2X,1H6
     12X,1H7,2X,1H8,2X,1H9,1X,2H10,3X,7HANSWER=,2X,1H1,2X,1H2,2X,1H3,2X
     21H4,2X,1H5,2X,1H6,2X,1H7,2X,1H8,2X,1H9,1X,2H10)
C*****THINK*****
      DO 13 N=1,10
      DO 14 I=1,10
      DO 15 J=1,10
      LS(N,I)=LS(N,I)+LA(N,I,J)*LIN(J)
   15 CONTINUE
   14 CONTINUE
   13 CONTINUE
C*****THINK AGAIN*****
      DO 50 KB=1,20
      DO 51 N=1,10
      DO 16 I=1,10
      MS(I)=LS(N,I)
   16 CONTINUE
      CALL THINK(MS,MQ,MP,LEX)
      DO 17 I=1,10
      LQ(N,I)=MQ(I)
      LP(N,I)=MP(I)
   17 CONTINUE
      LANS(N)=LEX
   51 CONTINUE
C*****CHAIRMAN GO *****
      DO 18 I=1,10
```

```
      LT(I)=0
      DO 19 N=1,10
      LT(I)=LT(I)+LP(N,I)
   19 CONTINUE
   18 CONTINUE
C*****WRITE*****
      WRITE(6,104) LANS,LT
  104 FORMAT(1H0,10X,10I3,10X,10I3)
C*****LEARN*****
      DO 20 N=1,10
      IWA=0
      MAX=0
      DO 21 I=1,10
      LQ(N,I)=LQ(N,I)*LT(I)
      IWA=IWA+LQ(N,I)
   21 CONTINUE
      IF(IWA.EQ.0) GO TO 20
      DO 22 I=1,10
      LS(N,I)=LS(N,I)+10*LQ(N,I)/IWA
   22 CONTINUE
   20 CONTINUE
   50 CONTINUE
   10 CONTINUE
      STOP
      END
```

VARIABLE KA APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

VARIABLE KB APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

VARIABLE MAX APPEARS AT LEFT SIDE OF SYMBOL '=' , READ OR ASSIGN STATEMENT, BUT IS NOT USED ANYWHERE.

ERROR 216, LEVEL 1.

EXTERNAL FORMULA NUMBER - SOURCE STATEMENT - INT

```
      SUBROUTINE THINK(LS,LQ,LP,LEX)
      DIMENSION LS(10),LQ(10),LP(10),LG(10)
      IWA=0
      DO 10 I=1,10
      LG(I)=LS(I)**2
      IWA=IWA+LG(I)
      LP(I)=0
   10 CONTINUE
      IF(IWA.EQ.0) GO TO 14
      MAX=-1
      LEX=0
      DO 11 I=1,10
      LQ(I)=100*LG(I)/IWA
      IF(LQ(I).LT.MAX) GO TO 11
      IF(LQ(I).GT.MAX) GO TO 12
      IF(LEX.EQ.0) GO TO 11
      LP(LEX)=0
      LEX=0
      GO TO 11
   12 MAX=LQ(I)
      LP(LEX)=0
      LEX=I
      LP(I)=1
   11 CONTINUE
C.....NEXT VARIABLE.....
      IF(MAX.GT.20) GO TO 13
      IF(LEX.EQ.0) GO TO 13
      LP(LEX)=0
      LEX=0
      GO TO 13
   14 DO 15 I=1,10
   15 LQ(I)=0
   13 RETURN
      END
```

```
 5   1  20   2   6   0   3   2   0   2
 0   5  26   0   9   3   0   2   0   0
64  57   0  20   1   3   3   2   0   0
 2  24  36   5  24   0  21   0   0   0
13   4   0  64   0  76  13   4   7   0
 0   1   7   1  37   6  13   1   0   4
 5   2   2   0   8   0  13  39  15   0
 0   0   3   0   3   4   1  10  69  21
 5   1   3   5   0   3  22  10   0  48
 2   1   0   0   6   2   5  24   5  21
                                        TAKECHAN
 4  33  49   3   0   0   5   0   0   0
 8  11  21   2   0   4   0   1   0   0
 8   8   6  20   0   9  11   4   0   0
 9  25   0   0  67   0   0   3  11   2
29  14  11  24   7  70   0   2  13   2
 2   1   0   1   0   7  49   0   1   5
 9   1   0  26  20   2   1  71   6  11
 3   2   5  13   0   3   1   7  63  57
12   0   0   7   0   2   4   0   0  14
10   0   3   0   2   0  25   8   3   4
                                        TAKECHAN
 0   1  11   1   4   0   0   1   0   9
21   2  73  20   0   0   0   0   2   0
36  14   8   0   7  30   1   1   5  12
32  69   5   5  15  21   2   1   0   5
 3   3   0  48   2   0  10  14   0   3
 0   1   0  11   0   0  18   0   0   1
 1   1   0   8  56  32   1  11   1   5
 1   0   0   0   8  12  42   4  74  53
 0   1   0   1   0   1   2   3  13   8
 1   2   0   3   3   0  19  62   1   0
                                        TAKECHAN
 4   1  22   5   5   5   2   0   0   2
15   2  33  13   6   5   1   0   1   1
15  78   0  15  14   1   1   0   3   1
 0  13  35   0   4  14   8   1   5   2
 8   0   4   8  10   0  20   0   6   8
25   1   0  34  24   1  10   1   0   4
14   0   0   7  17  43   0  36   3   0
14   0   2  10   0  23  45   2  76  74
 1   1   1   1   3   2   7  21   0   2
 0   0   0   2  11   0   1  35   3   1
                                        TAKECHAN
 0   5   3   5   0   0   0   0   0   6
 1   6  30  13   1   3   0  11   1   2
69  70   7  18  13   0   2   0   0   1
20  10  35   5  34   5   0   0   0   7
 0   0   2   4   4  79  51   2   0  16
 1   1   8  31   1   3   2   9   3   5
 3   2   1   0  38   0   5   0  18   5
 1   0   6  12   0   3  19   2  73   2
 1   1   4   3   0   1   6  67   0  31
 1   0   0   4   5   1  10   5   2  21
                                        TAKECHAN
```

```
 0  18  25   0   0   0   0   0   1   3
36   1  44   6   0   5   0   5   0   1
37  38   0  62   2   9   0   6   0   0
 3  23  13   0  27  36   5  13   8   2
 0  15  11  18   0  16  42   0   1   3
 6   1   0   3  16   5   6  11  13  12
 8   0   4   3  47  13   2  55  59   2
 1   0   0   4   4   0  40   0  11  65
 3   0   0   0   0   0   0   5   3   6
 1   1   0   0   0  13   0   0   0   2
                                        TAKECHAN
15   0  55  25   0   3   3   1   1   1
15  11   0  26   2   5   1   0   1   6
20  64   9   5   6   2   2   1   0   6
17   8  17   5   7   7   3   4   0   0
16   0   0  14   4  51  42   1   9   6
 6   5   2  16  40   7   3   0   0   0
 7   6   9   1  30  20   0  19   3  40
 0   0   0   2   2   1  37   4  54   1
 0   1   1   0   4   0   5  46  10  14
 0   0   3   1   0   1   0  20  19  22
                                        TAKECHAN
24  10  55   6   0   5   5   0   2   2
16   0   6   6   0   1   4   1   1   1
 0  49   3  34   6   2   9   0   0   0
 8  11   2   6  63   6   0   2   3   0
27  13  25  34   0   1  57  12  16   5
 4   5   0   7  16   3   0   3   0   0
 8   3   6   0   0  67   3  24  10  20
 4   1   0   2   1   2  11   2  43  62
 2   1   1   0   5   2   2   2   9   1
 3   2   0   1   5   6   4  50  12   6
                                        TAKECHAN
 3   4  21  11   0   2   0   0   3   3
16   4   9  13   0   7   1   2   2   0
57  81   8  36   0  24   3   2   0   2
10   0  43   0  29   0   2  13   4   0
 3   0   1  31   1  14  48   2   1   0
 2   3   4   2  29   0   3   8   1   0
 2   2   8   0  34  28   4   8   0   8
 0   0   1   1   1  18  18   2  83  41
 0   0   0   0   1   3   9  36   2  39
 1   2   0   2   0   0   7  23   0   2
                                        TAKECHAN
 2   8   2  16   0   6   2   1   3   2
25   1   5   1   0   2   0   2   3   1
50  69   0  72   8   9   9   0   0   1
 1  11  58   1  48  11  11   9   8   4
11   0   7   3   1   1   2  13   0   0
 7   2  11   1  26   0   8   2   0   2
 0   1   9   0   5  46   0  49  11   8
 0   2   0   1   7   0  35   5  68  66
 0   0   0   0   0  10  21   1   3   0
 0   1   0   2   0  11   6  13   0  10
                                        TAKECHAN
```