MEMORY IN GP
DIFFERENT APPROACHES TO MEMORY AND STATE

(A) Named memory (settable variables) using terminals $M_0$ and $M_1$ and functions $(\text{SETM}0 X)$ and $(\text{SETM}1 Y)$ (Koza 1992)

(B) Indexed memory similar to linear computer memory (Teller 1994) using functions $(\text{READ K})$ and $(\text{WRITE X K})$

(C) Matrix memory and memory isomorphic to world (Andre 1994)

(D) Point-labeled, line-labeled directed graphs (Brave 1995, 1996)
SETTABLE VARIABLES AND SETTING FUNCTIONS (KOZA 1992)

- FUNCTIONS (Writing)
  - SETM0 (arg1)
  - SETM1 (arg1)

- TERMINALS (Reading)
  - M0
  - M1
LINEAR INDEXED MEMORY (TELLER 1994)

• FUNCTIONS FOR READING AND WRITING
  • WRITE(expression, address-arg)
  • READ(address-arg)
LINEAR INDEXED MEMORY (TELLER 1994)

TWO-DIMENSIONAL ARRAY
MATRIX MEMORY — MEMORY ISOMORPHIC TO WORLD (ANDRE 1994)

GOLD-DIGGER WORLD WITH “MAP-MAKER” AND “MAP-USER”
MATRIX MEMORY — MEMORY ISOMORPHIC TO WORLD (ANDRE 1994)

THE 5 x 5 GOLD-DIGGER WORLD

5 x 5 MEMORY

FUNCTIONS

• WRITE(expression, address-arg)
• READ(address-arg)
MATRIX MEMORY - MEMORY ISOMORPHIC TO WORLD (ANDRE 1994)

MAP-MAKER AND MAP-USER BRANCHES OF MULTI-PART PROGRAM
MEMORY ISOMORPHIC TO WORLD (ANDRE 1994)

TYPICAL MEMORIES PRODUCED BY MAP-MAKER

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EVOLUTION OF MENTAL MODELS FOR A PATH-PLANNING TASK (BRAVE 1995, 1996)
EVOLUTION OF MENTAL MODELS – CONTINUED

THE WORLD — 16 ITEMS
EVOLUTION OF MENTAL MODELS – CONTINUED

MEMORY CONSISTING OF PALLET OF ISOLATED NODES WITH DYNAMICALLY CREATED LABELLED DIRECTED CONNECTIONS
EVOLUTION OF MENTAL MODELS – CONTINUED

GENERATION 12

GENERATION 16

GENERATION 24

GENERATION 32