

Neural Turing Machine



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Project Goals



- What is Turing Machine?
- Why to build Neural TM?
 - NTM --> power of Universal Computer!!!
- How to build Neural Turing Machine?

Example of Turing Machine Java Applet

Turing Machine Applet

Developed by Buena Vista University Java Team

Ye Olde Turing Machine

Opening File: addition.t
This program adds two unary numbers separated by # a 0 and prints the result one space to the right.

Alan Turing
1912 - 1954

0
State

← Turing Machine

Input/Output Tape

110111

Rule List =>

```
0 1 0 >
0 0 1 1
1 1 1 >
1 - 2 <
2 1 3 -
3 - 4 <
4 1 4 <
4 - 5 >
```

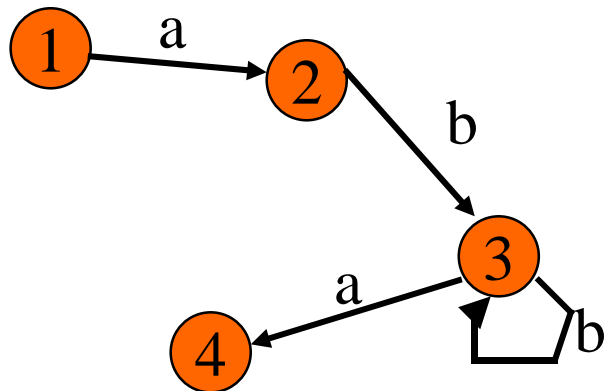
Talk Clear Stop Step Auto Fast Auto Change State 0 Load addition.t Update

Applet Turing running

Example of simple program

Words of regular language:

a, aba, abba, abbba, ...

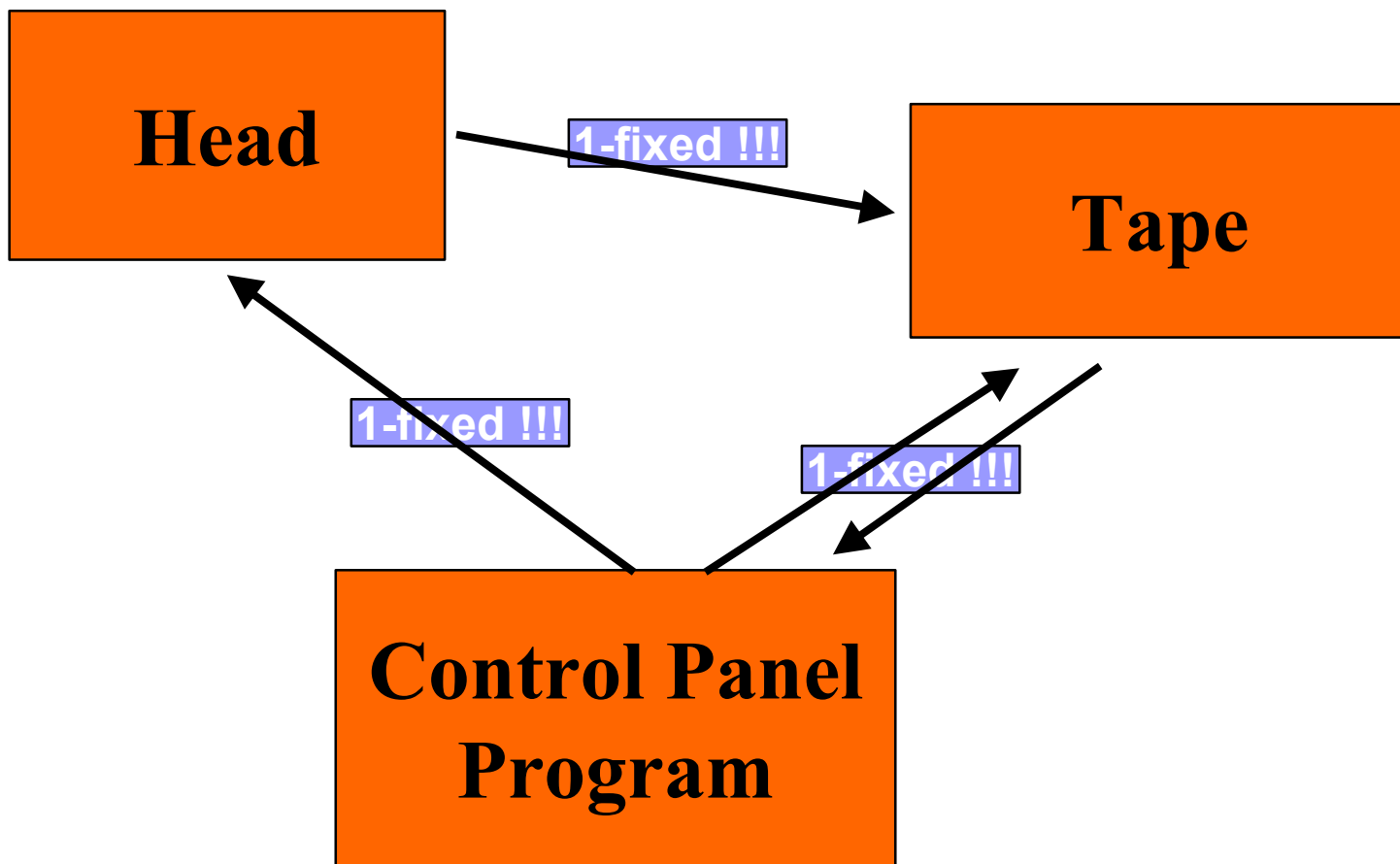


What is the program?

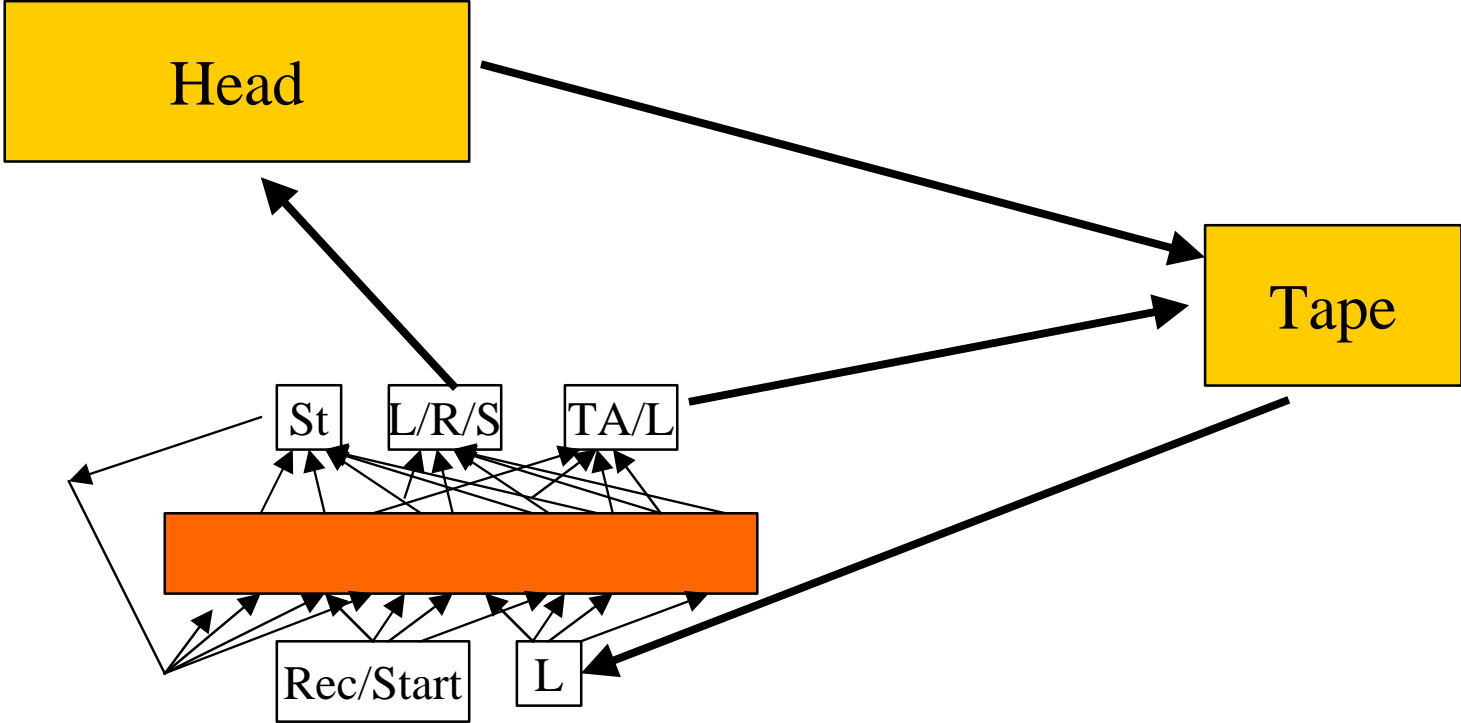
State	Head	New State	Head Action	Cell Act.
1	a	2	R	-
2	b	3	R	-
3	b	3	R	-
3	a	2	R	-

OK if last state = 2 or 4

Neural Turing Machine



Control Panel & Program



Head

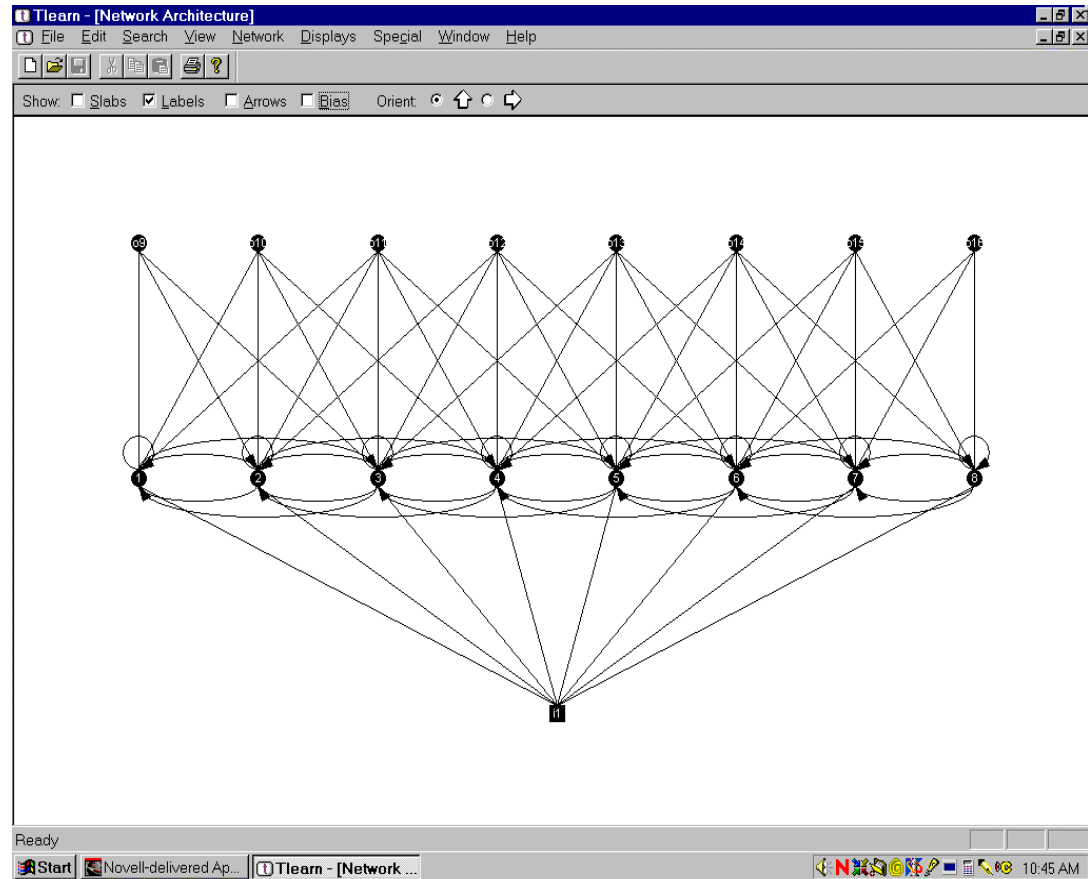
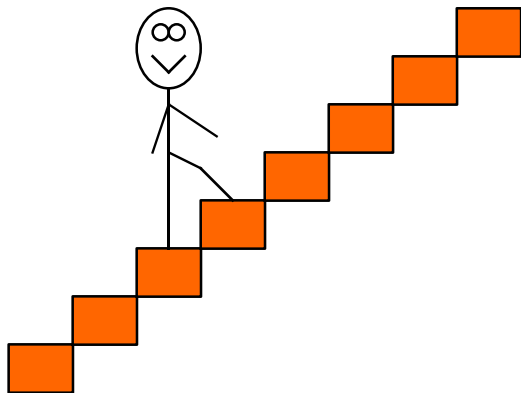
Head = Straits!

Actions (input):

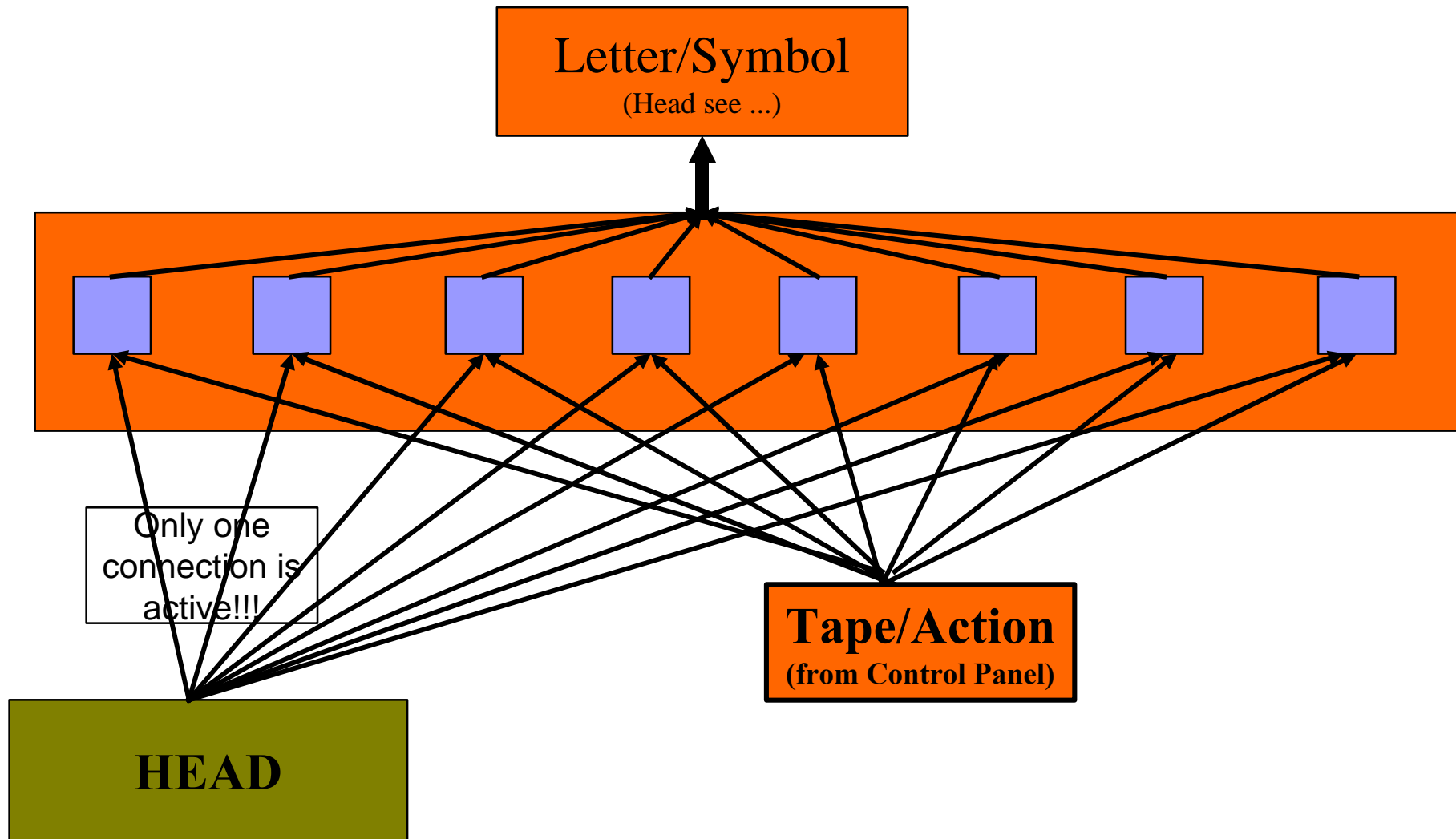
Up 1

Down -1

Stay 0



Tape = Cluster of Beetles



Beetle

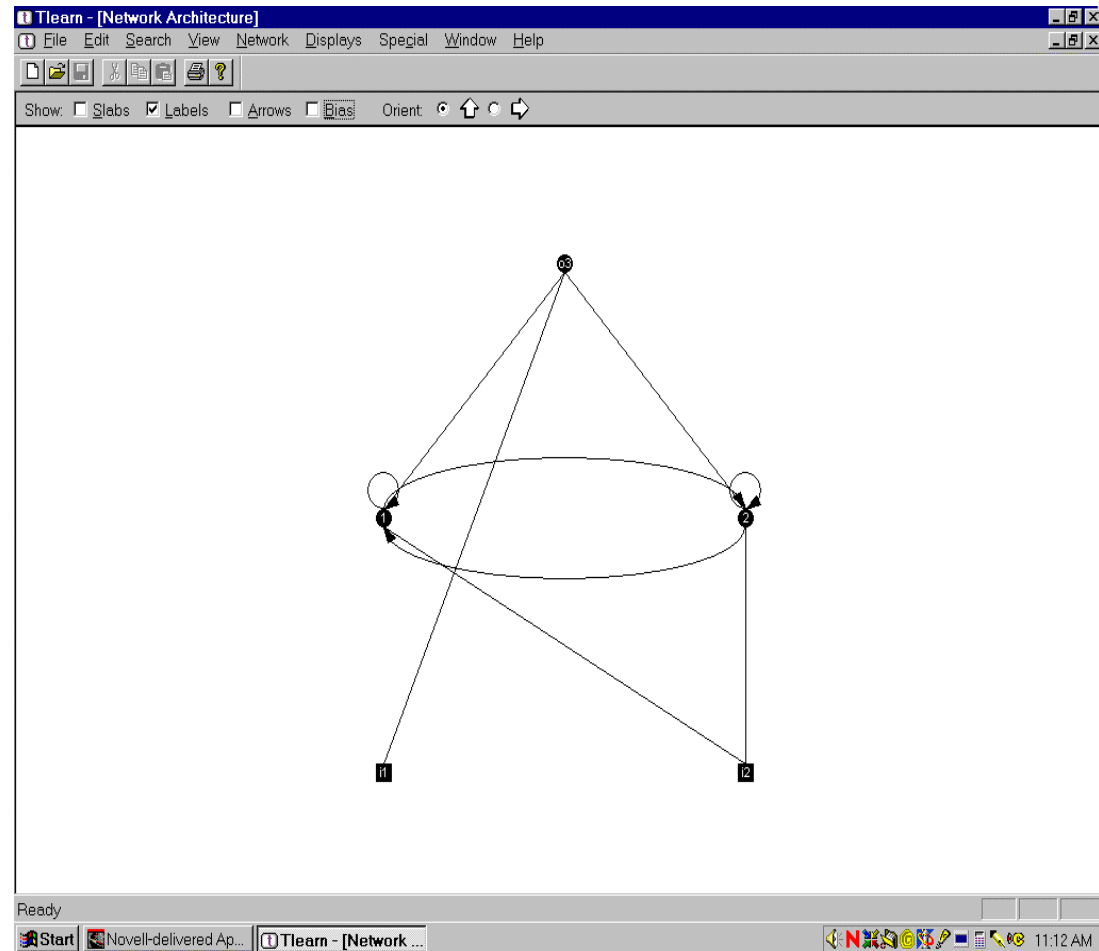


Goals:

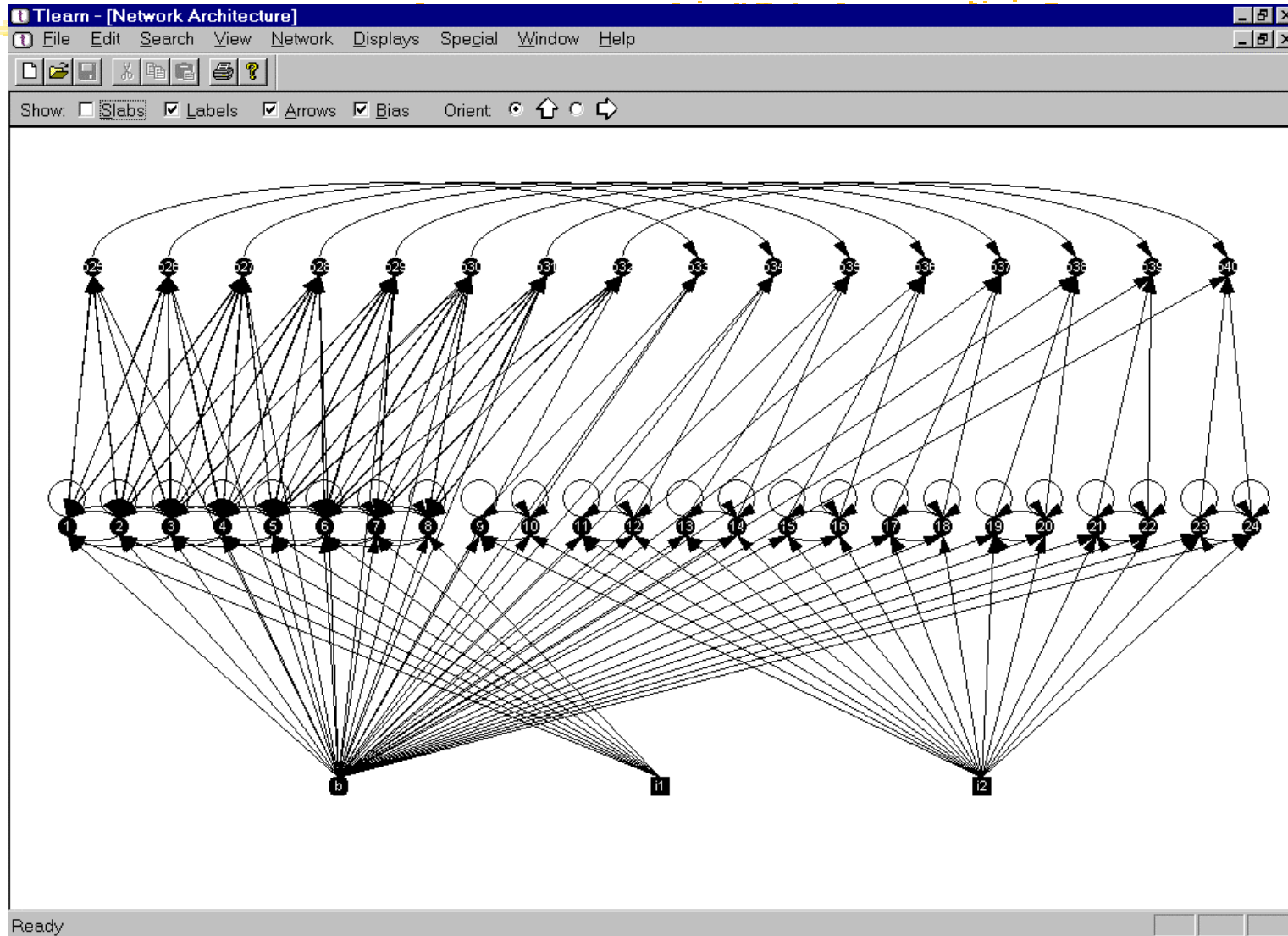
- keep state (letter or 0/1)
- hide/show

Actions:

- 1 0 - show s.
- 1 1/-1 - set s.
- 0 ? - sleeeep



Head + Tape



Control Panel / Program

