

Short Reference : Turing-Workshop 1.2

Main-menu



Load

Loads a machine.

Append

*Puts the instructions of a machine M2 at the end of the table of a machine M1.
You can now combine M1 with M2.*

Save

Saves a machine with all settings.

Additionally three textfiles are saved :

machine.txt : contains the description of the machine if existent.

machine.tab : contains the table of the machine.

machine.col : contains colours of coloured states.

New

New 1 ... New 4

Creates a new, empty machine with 1..4 tapes

Language

English

Switch to user interface in English.

German

Switch to user interface in german.

?

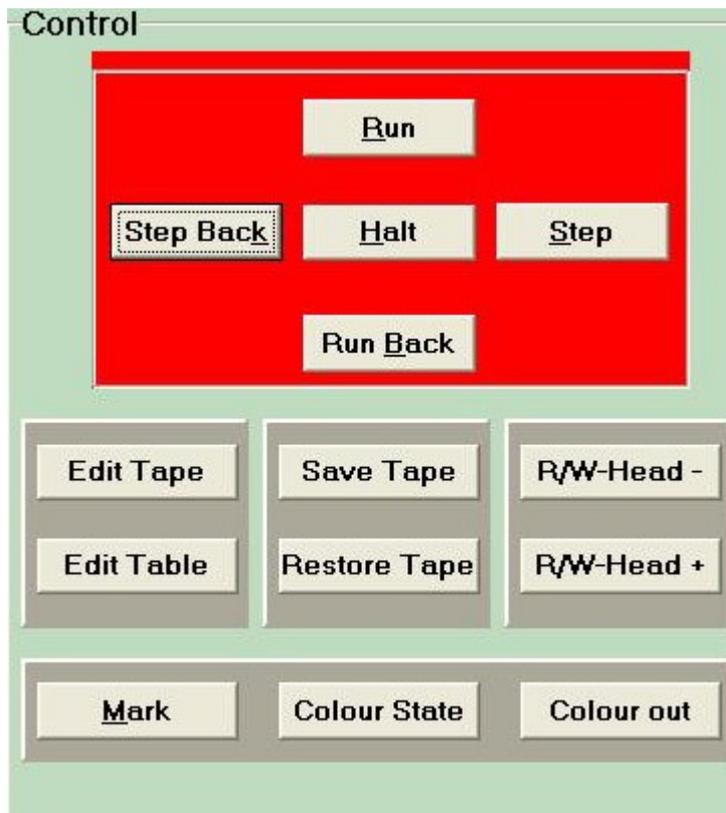
Info

Notes from the author, terms of use

Description

Opens a window where you can describe the machine.

Mainform



Control

Step

Executes current instruction.

Run

Executes instructions until 'Halt' or the current instruction has an active mark or there is no suitable instruction.

Step Back

Undo the last step.

Run Back

*Undo Step by Step until the start or the last stop.
(You can undo until 5000 steps)*

Halt

Stops the machine.

Jump (visible only if jump-mode is on)

Behaviour like ,Run'. But no actions are performed on the tapes until the machine stops.

Jump Back (visible only if jump-mode is on)

Behaviour like ,Run back'. But no actions are performed on the tapes until the machine stops..

Tape-Editor

Shows the form tape-editor. You can now specify the content of each tape.

Table-Editor

Shows the form table-editor. You can now specify the content of the table.

Save Tape

Stores the contents of all tapes.

Restore Tape

Restores the contents of all tapes.

R/W-Head -

Moves the read-write-head one step to the left.

R/W-Head +

Moves the read-write-head one step to the right.

Mark

*Tags the current instruction with a mark. Repeated use of the mark button will toggle the mark through : * + - % no mark * ...*

Colour State

Tags the current state with a colour. Repeated use of the this button will toggle the colour.

Colour on

Coloured states are shown in the chosen colour.

Colour out

All States are shown in white colour.

Status

State	Steps	Speed	Tapes
0	0	5	2
Position 1	Position 2		
0	0		

active Marks

M* M+ M- M %

Adjustment

Learn Jump Distance: 1000

State

Shows the current state. You can alter it.

Speed

You can specify a number to set the delay (0 : no delay, 9 : very slow)

Tapes

The window shows the number of tapes.

If you increase this number up to at most 4, the machine will get additional tapes.

Active Marks

M*, M+, M-, M %

You can activate or deactivate each of the marks.

If the current instruction has an active mark, the machine will stop on 'Run', 'Run Back', 'Jump' and 'Jump Back'.

Adjustment

Learn

Toggles the learning-mode. If you put the learning-mode on, the table-editor will be shown. Use learning-mode when the table is not complete. Press 'Step' to keep the machine going. If the machine has no suitable instruction the focus will be set to the input-area of the table-editor. Now put in a suitable instruction, send it into the table. Press 'Step'.

Repeat the procedure until the table is complete.

Jump-mode

Toggles the jump-mode. If jump-mode is on, the buttons 'Run' and 'Run back' change to 'Jump' and 'Jump back'

Distance

In order to prevent infinite loops a maximal jumping distance needs to be specified.

Inspect

Toggles the inspection-mode. If inspection-mode is on, you can inspect all characters of the tapes.

Inspect Tapes

If inspection-mode is on, the scrollbars for each tape are activated. Use the scrollbars to inspect all the characters.

Tape-Editor



Erase

Erases all tapes.

Accept

The machine loads the new contents for its tapes.

Exit

Closes the form for the tape-editor.

Exchange Tapes

The contents of two tapes are changed as well as the corresponding characters of the instructions.

From Tape to Tape

Specify which two tapes are to swap position.

Table-Editor

Input Instruction

State Char Char Move State

Clear

Joker : ? , ! blank : _ Move : L,R,N,S,P,H

Choose Mark

no mark M* M+ M- M%

Accept

Table

```
S000 a[ : aa RH S000
S000 _[ : __ SS S000
S000 a[ : aa RH S000
S000 aa : aa RH S000
S000 ab : a_ RL S000
S000 b[ : bb RH S000
S000 ba : b_ RL S000
S000 bb : bb RH S000
```

Selection

Edit

Forward

Backward

Delete

Tools

Insert States

Renummer States

Change Char

Change Move

Exit

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Input Instruction

State

Set starting state. (S0 - S999)

Character

Set the characters at the beginning for all tapes.

Character

Set the new characters for all tapes.

Move

Specify a move for each tape.

***R** to the right, **L** to the left, **N** no move, **S** Stop,
P push to the left, **H** push to the right*

State

Set final state.

Choose Mark

No mark

M* : *set mark **

M+ : *set mark +*

M- : *set mark -*

M% : *set mark %*

Clear

Clears all fields from the input-area.

Accept

Inserts the contents of the input-area into the table as an instruction.

Selection

Hint : If you want to change an instruction of the table, you need to first bring it to the edit-field below the input-area. Then you can bring the instruction to the input-area. Now you can change it.

Forward

Puts the next instruction of the table into the edit-field below the input-area.

Backward

Puts the previous instruction of the table into the edit-field below the input-area..

Click an instruction

Puts the clicked instruction into the edit-field below the input-area

Scroll table

You can scroll the instructions of the table.

Edit

Brings the instruction of the edit-field below the input-area into the input-area . Simultaneously the instruction will be removed from the table.

Delete

the instruction of the edit-field below the input-area will be removed from the table.

Tools

Insert States

Fills in a gap in the sequence of state numbers.

Re-number States

If a machine has n states, then their numbers will run from 0 to n-1.

Change Characters

Changes a character with another character in all instructions.

Change Move

Changes all directions on the chosen tapes.

$R \leftrightarrow L$ and $P \leftrightarrow H$, S and N unchanged.

Some important remarks

1) How an instruction is build

Example : $S_0 \text{ ab : cd RL } S_2 +$

if the machine is in state S_0 and the R/W-head is over an 'a' at tape1 and over an 'b' on tape 2 then the machine writes 'c', 'd' on tape1, tape2, step to the right on tape1 and to the left on tape2. The new state is S_2 . The mark '+' means, that if '+' is active, the machine will stop in running mode by executing this instruction.

2) Can I write any character on the tapes ?

There are only five exceptions

a) *'_' stands for a space. Therefore it can not be used as a character on a tape.*

b) *'?', '!', '\$', '#'* are joker-characters and must not be used on a tape.

A joker-character can stand for any character.

Example :

$S_1 \text{ ?! : !? R } S_2$ changes the characters from tape1 and tape2 no matter what is really written on both tapes.

Imagine $S_1 \text{ ?! : !? R } S_2$ and $S_1 \text{ ab : cd R } S_2$ are both in the table of a machine with two tapes and ab is written on the tapes and S_1 is the current state then $S_1 \text{ ab : cd R } S_2$ will be executed because this instruction has no joker-character.

Instructions without joker-character come first.

3) Which machine will be loaded if TWS.exe starts ?

TWS.exe stores the path to the last handled machine in Workfile.txt.

On the next start TWS.exe tries to load this machine.

If it fails, TWS.exe is searching for a machine intro.tm.

If TWS.exe can't find intro.tm it starts with an empty turing-machine with four tapes.