

Low Level Implementation of a Turing Machine

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For this project I am implementing the following language $A = \{a^n b^n c^n d^n e^n | n \geq 0\}$ as a Turing Machine with JFLAP [?].

1 Turing Machine Definition

The following Turing Machine T decides $A = \{a^n b^n c^n d^n e^n | n \geq 0\}$:

T = "on input w where $w \in \Sigma$:

0. On empty input string accept, otherwise go to step 1
1. Mark one a with an u, if there are no more a's go to step 7
2. Mark one b with an v, if there are not b's to mark reject
8. If no a's, b's, c's, d's, or e's remain on the tape accept."

2 Turing Machine Implementation

The following describes the implementation shown in Figure 1. The implementation files are in the github repository [?].



Figure 1: Turing Machine

3 Turing Machine Testing

To test the TM, I created a shell script to generate test input strings of various lengths. It is called `createteststrings.sh`. It creates random strings in the language to see if any are accepted by the turing machine. The files I used for testing were `testfile_abcde_rand.txt` and LAP.

References

- [1] Project github,
<https://github.com/rodger79/5700-TuringMachine>
- [2] JFLAP,
<http://www.jflap.org/getjflap.html>