Turing Machines Project

Discrete II

Spring 2017

Description of Project

The goal of this project is to learn about Turing machines and analyze information sources you find on them. You may work in groups of up to four people. Do not procrastinate by waiting until the week before it is due: you are unlikely to score well if you complete the project at the last minute. Email the instructor at jbeyerl@uca.edu if you have questions while you complete the project.

Learning Objectives

- Define and learn about Turing Machines.
- Analyze references on Turing Machines.
- Compare Turing machines and finite state automata.

Project Description

In this project you will need to research Turing machines, learn what they are, and describe them. In particular, there are three parts:

1. Find and analyze 7 references for Turing Machines. At least one reference must be in academic literature; one in popular culture; and one that is a "5" on accessibility.
2. Describe informally, in English sentences what a Turing Machine is.
3. Formally define a Turing Machine in terms of sets and functions. Give a one-sentence description of what each set or function is.
4. Given any Grammar G_1, a Turing Machine can determine what strings are in the language $L(G_1)$. Given any regular Grammar G_2, a finite state automata can determine what strings are in the language $L(G_2)$. Use these two facts to compare Turing Machines and finite state automata. Explain.

Other Specifications

- The write-up should be at most 3 pages.
- You may work in groups (max 4 people) or alone.
- The project should be typed and saved as a PDF, then submitted on Blackboard. The penalty for incorrect submission format is 10% of the maximum score.
- Cite any sources that you use – plagiarism will result in a 0% grade. You may create a standard bibliography in addition to the reference list in part (1). References analyzed in part (1) need not be cited again in the bibliography. The reference list in part (1) counts toward the page limit; any additional cited works do not.
- The project is due on Blackboard Wednesday April 26th at 9:00am. Assignments submitted late will receive a late penalty of 0.2% per hour.

Reference tables for analyzing references

Reference reliability scale: “Accuracy” refers to the correctness of the reference.

- 1 – The reference itself gives you reason to question its accuracy.
- 2 – Something other than the reference itself gives you reason to question its accuracy.
- 3 – There is no specific reason to trust or question the accuracy of the reference.
- 4 – Something other than the reference itself gives you reason to trust the reference.
- 5 – The reference itself gives you reason to trust it.

Reference accessibility scale: “Accessible” refers to the understandability of the reference.

- 1 – The reference is not accessible at all.
- 2 – The reference is not very accessible.
- 3 – The reference is in the middle.
- 4 – The reference is accessible.
- 5 – The reference is very accessible.