Deterministic Finite Automata: DegreeHelper

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1. Abstract

This project will focus on the creation of a Deterministic Finite Automata, or DFA, its implementation in Java, and its application as a real-world problem-solver. This paper will explore a detailed system description of the project, the physical requirements of the system resources, a literature survey exploring through similar systems and what sets this one apart, a user manual that highlights proper use and error prevention, and a description of what the plans are for the future drafts of this project. Included is the DFA diagram of the project.

2. Introduction

This project is the product of experience being a college student during class registration. As every college student that goes through this understands, class registration can be a very stressful time for a multitude of reasons. As every college freshman knows, most importantly undecided majors, it is even harder to map out a class schedule when every other class has prerequisites, is only taught during the Spring, or has a peculiar amount of credits. DegreeHelper seeks to remedy some of these issues and make Degreeworks a little more manageable.

3. Detailed System Description

DegreeHelper, as of now, will borrow some elements from both Degreeworks and the class registration catalog; it will use class codes, CRNs, prerequisites, and credit amounts for each class from the catalog, and degree requirements from Degreeworks. Each user will interact with DegreeHelper in a different way, depending on their concentration as well as what they

want out of the application. It is possible to use DegreeHelper as a replacement for the catalog, as well as a planning tool for registration. More detailed use in the User Manual below.

4. Requirements

DegreeHelper will only require user input via keyboard, so no other external devices are a requirement.

5. Literature Survey

The obvious comparison can be drawn between Degreeworks itself and DegreeHelper. This is in no way meant to replace Degreeworks; it is a tool to be used alongside Degreeworks, as well as during the planning stage of a student's degree. DegreeHelper is designed to combine Degreeworks and the class catalog, effectively eliminating the back-and-forth between the two during registration planning.

6. User Manual

A user will enter their Computer Science concentration (the project, as of now, only focuses on the Computer Science Degree, but can be expanded into other degrees, minors, and concentrations). Once they have entered their concentration, they will first enter a specific class they would like to take. This class will serve as the accepting state for the session, and the system will return the accepting state's class info, including class code, CRNs, credits, etc. The user will then be prompted to do one of two things: input the class codes of what classes they wish to take leading up to the accepting state's class, or leave the prompt blank and submit nothing. Submitting nothing will prompt the user to re-enter a class code (AKA a new accepting state.) Submitting a sequence of classes, however, will let the user know if the path they have chosen makes sense prerequisite wise, or return an error displaying what prerequisites are missing from the selected sequence. In either case, the session will restart and a new class code can be entered.

7. Conclusion/Planning Ahead

While my project with DegreeHelper for Formal Languages is done, DegreeHelper has a lot of potential. There can be expansion into other degrees/concentrations/minors, a DFA diagram expansion, a GUI, and many other possible features. There is potential in this application to make class catalog management issues a thing of the past, and aid future students in making more informed decisions when planning their future.

8. Bibliography

[1] E. Gribkoff “Applications of Deterministic Finite Automata” ECS 120 UC Davis, Spring 2013.