CSCI 305 Concepts of Programming Languages

Programming Lab 4 — Shortest Path in PROLOG

PROLOG:

For this lab you will need to learn and use SWI-Prolog. (You have seen a few examples in class, but you do need to learn more on Prolog to finish this lab.) It is required that you use this version of Prolog finish this lab. SWI-Prolog is installed on `esus`, or most Linux systems. Type `pl -v` to check your version.

Dataset:

Your code should work for graphs with a decent size. For your convenience, a simple weighted graph with 19 edges is given. You can download the data (i.e., part of the code) at

`http://www.cs.montana.edu/bhz/classes/spring-2016/csci305/LAB4/lab4.pl`

You need to define/finish a function `shortest(i,j,Path,Length)` to support the query to compute the shortest path `Path` between `i` and `j`, with a length `Length`. (You can take a look at `example8.pl` that was covered in class, though it was only for unweighted graphs.) Notice that Prolog is a declarative language, so you do not have to know/apply any famous shortest path algorithm. We hope that, through this lab, you will learn the difference between Prolog and any imperative language through some first-hand experience.

As the dataset is not huge compared with Lab 2, you need to come up ways to test the correctness of your code. We will run your code to do some queries; for instance, `shortest(1,9,P,L)`, to test the correctness of your code. We might use different datasets in the grading process.

Troubleshooting

This lab requires an independent study of the Prolog language. Given the size of the class, we will not be able to debug your code for you. Please do not send panicked emails requesting us fix your bug for you — same as when you work for a company. Do allow yourself plenty of time, and use patience, perseverance, and the internet to debug your code. *On the other hand, if you do need help for general ideas, you are welcome to contact us.*

Submission

Each student will complete and submit this assignment individually or in a 2-person team. Comment your program properly, intelligent comments and a clean, readable formatting of your code account for 20% of your grade for this lab.

Save the final version of your program as `lastname_firstname.lab4.pl`. Submit the final version of your program.

Team members will submit identical code. But each student must submit individually and at the beginning of your code you must state clearly your name and your partner's name (if any). Submit your file to the Lab4 dropbox folder on D2L. Note that late submissions will not be accepted.

DEADLINE: April, 26, 2016; 11:30pm.