University of Calgary   **Fall 2022**

Department of Civil Engineering   Instructor: T. Jin

ENCI 697 Project Planning and Control

Assignment 1 – Scheduling network modelling

This assignment requires programming; recommended programming languages include C++, JAVA, Python and/or MATLAB.

This assignment aims to demonstrate the basic modelling of a scheduling network:

1. Develop a model that takes in the first three columns of the table from the attached csv file and returns the project duration, critical path, and output table in the format depicted below. Assume Finish to Start relationships between activities with no lags (FS = 0).
   Note that your program should be able to automatically take *any* other tables given in a csv file; i.e. with any number of activities, durations, and dependencies.
2. Repeat question 1 using all 5 columns; i.e. to consider different relationship types and lag times.

 Output Format:

Project duration is:_____

The critical path is:_____

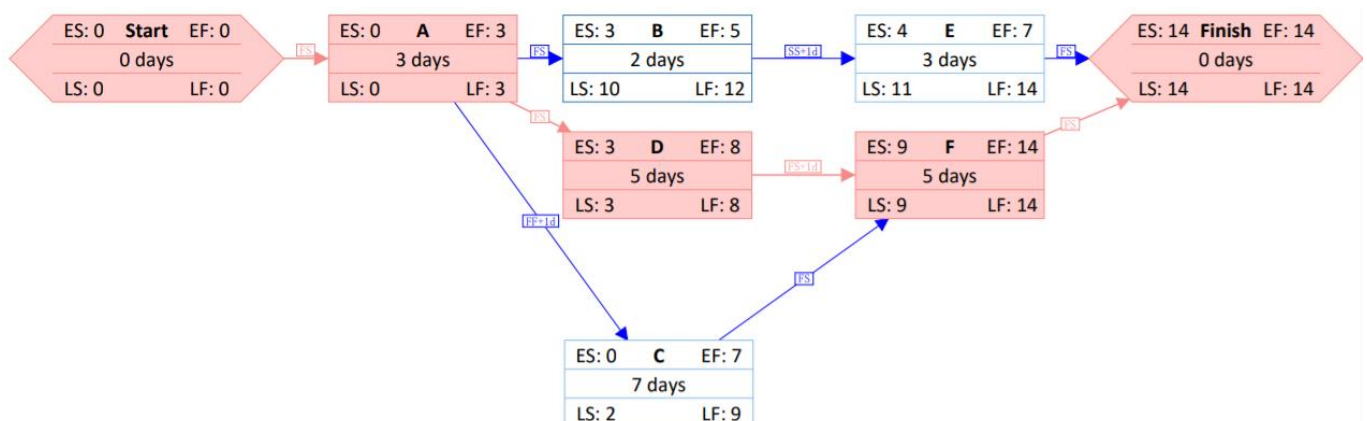| Activity	Duration	ES	EF	LS	LF	TF	FF

Note: Tabulated information with clear indentation is acceptable in lieu of table

Bonus Marks: Return the PDM diagram of an any given project.

A sample PDM format is attached as an example:

Key output: EF, ES, LS, LF, Activity Name, Activity Duration, Arrow Heads, Relationships & Lag times (for Q2).

Optional: Highlight critical path

Submission Requirements:

Submit to **Assignment 1 Dropbox folder** on D2L

- Two files are required for the submission, one for each question: Q#_name (e.g. Q1_tian)
- A well-commented source code. Your program should be commented well enough for the instructor to understand it. E.g., in Live script, Jupyter notebook, or Pycharm etc.
  Rules for comments: author, year, to compile, language, and library used etc.

  A sample comment is provided as following:

```
/*========================================================================
|    Assignment:   ASSIGNMENT NUMBER AND TITLE
|
|        Author:   STUDENT'S NAME HERE
|          Year:   YERE HERE
|      Language:   NAME OF LANGUAGE IN WHICH THE PROGRAM IS WRITTEN AND THE
|                     NAME OF THE COMPILER USED TO COMPILE IT WHEN IT
|                     WAS TESTED
|    To Compile:   EXPLAIN HOW TO COMPILE THIS PROGRAM|
+------------------------------------------------------------------------
|
|   Description:   DESCRIBE THE PROBLEM THAT THIS PROGRAM WAS WRITTEN TO
|       SOLVE.
|
|         Input:   DESCRIBE THE INPUT THAT THE PROGRAM REQUIRES.
|
|        Output:   DESCRIBE THE OUTPUT THAT THE PROGRAM PRODUCES.
|
|     Algorithm:   OUTLINE THE APPROACH USED BY THE PROGRAM TO SOLVE THE
|       PROBLEM.
|
|   Required Features Not Included:  DESCRIBE HERE ANY REQUIREMENTS OF
|       THE ASSIGNMENT THAT THE PROGRAM DOES NOT ATTEMPT TO SOLVE.
|
|   Known Bugs:  IF THE PROGRAM DOES NOT FUNCTION CORRECTLY IN SOME
|       SITUATIONS, DESCRIBE THE SITUATIONS AND PROBLEMS HERE.
|
*========================================================================*/
```

- Please have in-text comments Eg: function defined, variables, please consult the guidelines for how to properly comment source codes.
  Please refer to the following link for best practices for in-text comments
  https://stackoverflow.blog/2021/07/05/best-practices-for-writing-code-comments/
- Please don't submit the original csv file. A csv file with different content but same format will be utilized to test and verify your code.
- A PDF copy of your report