**Project 4**

**Objective:**

The purpose of this lab project is to expose you to selection, to enforce Loops, and to expand your skills to write larger programs.

**Problem Specification:**

Write a C++ program to calculate a students GPA for the semester. The program should accept a student’s name, ID number and the number of courses he/she is taking, then for each course the following data is needed

* the course number a string e.g. BU 101
* course credits “an integer”
* grade received for the course “a character”.

The program should display the student’s name, ID number, the total number of credits for the semester, and grade point average for the semester. A warning message should be also printed if the GPA is less than 2.0 and a congratulatory message if the GPA is 3.0 or above.

**Requirements:**

* Input student’s name, ID number, course number, number of credits for the course and grade using proper prompts.
* Use a loop to repeat for multiple students until ‘N’ or ‘n’ is entered in response to a prompt.
* Add comments to identify the variables used.
* Create constants representing the points for each grade.
* A 4 points
* B 3 points
* C 2 points
* D 1 points
* F 0 points
* Calculate using the constants you defined, and whatever data the user enters.
* Use at least 4 functions.
* Include data validation for all data entered

ID Range 0-9999

Number of courses 0 – 5

Grades are A,B,C,D,F.

* Have your program print proper titles for the output.
* Output the report as specified above.
* Comment thoroughly.

**Grading criteria:**

5 points Program is consistent with programming coding standards.(input, process, output)

5 points Proper spacing, comments, use of variables, general program appearance.

10 points A flowchart or algorithm is handed-in detailed and is correct.

5 points Hierarchical chart is included and is correct.

5 points Constants are used.

5 points at least 4 functions are used.

5 points Loop continues until ‘N’ or ‘n’ is entered

10 points appropriate pass by value and pass by reference.

10 points Titles are included and are appropriate.

10 points All entered data is validated.

10 points a message is printed

10 points Program runs correctly and produces the intended results.

5 points test runs to account for all outcomes are submitted.

5 points Use of toupper() function as a part of the condition.

**Submission Details:**

Submit a print-out of:

* The source files
* A flowchart of main only (pseudo code is not acceptable)
* Test runs.

**\*\*\* Due On: 04/20/2016 \*\*\***