**Lab 6 algorithm design**

1. I want to design a program that helps users calculate the student’s letter grade based on their grade percentage. Users will first enter the student’s name (first object), test subject(second object) and the percentage grade (third object), this will form the first array list. Then, the computer will append the fourth object, letter grade.
2. First I need to define my executable file. I want to define three functions.
3. The first function will be “student information”, which collects the user input and the computer will match the user input into the three objects by identifying commas. This will also collect all the information I need to store in my first array.

**Def student\_info:**

**Data = []; #create an empty list**

**While true:**

**All the data = input(“enter student name, test subject and grade in %”);**

**Try:**

**# use .split to split the string into three**

**Name, test subject, grade % = all the data.split**

**#wrap grade in float for decimal input**

**Grade % = float(grade.strip);**

**#add a condition that will return invalid input if grade <0 or>100**

**# add the string back in the list.**

**Data.append (name.strip, test subject.strip, grade %);**

**#include value errors to ensure invalid inputs are noted.**

**Except valueError:**

**print(“ wrong form of input”);**

**#run the user input one more time so they can re enter the data**

**Continues;**

**#indicate when to stop when running the loop.**

**Stop = input(“are you done? Yes to end loop, enter to continue”);**

**#case sensitive, use .lower to check if the user indicates a stop.**

**If stop.lower == “yes”;**

**#end loop**

**Break;**

**Return student\_info;**

1. This function will group the percentage of grade into letter grades. From 0-60 the system will return F, then every ten % will increase a letter grade.

**Def grade\_convert(grade in %):**

**”””100 will return 100, 90-99.999999(inf) will return A. 80-89.9999999(inf) will return B. And the rest letter grade repeats the same pattern”””**

**if grade% == 100:**

**return 'A+';**

**elif grade% >= 90:**

**return 'A';**

**elif grade% >= 80:**

**return 'B';**

**elif grade% >= 70:**

**return 'C';**

**elif grade% >= 60:**

**return 'D';**

**else:**

**return 'F';**

1. This third function will create the fourth column in the second array. This will be the last step of the entire system, so I also want to define how I want my results to be displayed to the user.

**Def fourth\_column():**

**#adapt data from the first function to gather info**

**Student = student\_info;**

**#create new empty list for the appended version**

**Student\_with\_lettergrade = [] ;**

**#use for loop to convert the grade percentage into letter grade**

**For students in student:**

**Name, test subject, grade = students;**

**#this will call out grade\_convert we defined here to fourth\_column**

**Letter grade = grade\_convert(grade);**

**#append the conversion into a new list.**

**student\_with\_lettergrade.append([name, test subject, % grade, letter grade]);**

**# Display the first array with name, test subject and grade, use print function to do so.**

**print("\nFirst Array: (Name, Subject, Grade):");**

**for student in students:**

**print(student);**

**# display second array with the appended converted letter grade**

**print("\nSecond Array: (Name, Subject, Grade, Letter Grade):");**

**for student in students\_with\_lettergrades:**

**print(student);**

3. At last, I want to call out my functions by importing them to the utility function lab6.py. I will first import the student\_info from studentdata.py file, and then call out student\_info.

**from student\_info import student data ;**

**student\_info();**