# Assignment 03 Sample

**Program StemSalary.py**

**Description:**

For this assignment, you will create a more complex modular program that uses at least two parallel arrays for storing related information, and has at least one loop that accesses the data in the arrays. This program stores 2 columns of data (STEM major and the corresponding major's salary) in 2 parallel arrays (lists). Then we will loop through the data and find the major with the highest salary.

**Sample Program Run:**

```
Welcome to my STEM salary comparison program!!

Enter a list of major names and salary when prompted and the program will
display the major with the highest salary and the major with the lowest
salary.

Enter major name: Petroleum Engineering
Salary: 110000

Add another? (y/n): y

Enter major name: Chemical Engineering
Salary: 65000

Add another? (y/n): y

Enter major name: Nuclear Engineering
Salary: c
Not a Salary.
Salary: -10000
Invalid Salary!
Salary: 75000

Add another? (y/n): y

Enter major name: Computer Engineering
Salary: 115000

Add another? (y/n): y

Enter major name: Computer Science
```

```
Salary: 120000

Add another? (y/n): n

Computer Science has the highest Salary: $120000
```

**Sample Algorithmic Design:**

a. Identify all of the user input. What are the data types of the inputs? Define the input variables.

- I would need a list of major names and their salaries from the user until they are done entering the majors.
- List for Major Name - majorName
- List for Salary for that Major - salary

b. Describe the program output. What is displayed to the user? What are the data types of the output? Define the output variables.

- A variable called max to hold the highest salary. This would be an int.
- A variable called majorMaxName to hold the name of the major with the highest salary.
- A variable called min to hold the lowest salary. This would be an int.
- A variable called majorminName to hold the name of the major with the lowest salary.
- The program outputs a message indicating that information.

c. What calculations do you need to do to transform inputs into outputs? List all formulas needed, if applicable. If there are no calculations needed, state there are no calculations for this algorithm.

- I don't need any calculations but I need a logical process to find the maximum in the list of salaries. This is described in step 4e, in the analyze data section.

d. Describe the process needed to transform inputs to outputs *using numbered steps*. Here is where you would use conditionals, loops, functions or array constructs (if applicable) and explain the process in transforming inputs into outputs.

1. Create functions to do the following:

2. welcome() function
    a. Output a welcome message.
    b. Output a brief description of what will be asked of the user and the data will they need to enter.

3. main() function
    a. main() declares 2 lists.
    b. Calls the welcome function
    c. Reads major name from the user
    d. Adds it to the list major

e. Reads salary from the user
f. Checks to see if it is a valid number.
g. Also checks to see if the number is > 0.
h. If not it stays in a loop until a valid number is entered
i. Adds it to salary list
j. Asks the user if they want to add more and stays in the function in a loop until the user enters ‘n’.
k. Declares variables for min and max.
l. Loops through to find the smallest and largest salary, and finds the corresponding major names.
m. Prints to the screen

8. Call main()