Lab 4 Assignment
EET 340
Introduction to Computer Organization and Architecture

Q1. The following C++ code calculates the voltage drop (V) and power dissipation (P) across a circuit. The user inputs are Resistance (R) and current (I). Write an assembly program and simulate it on ARMSim to calculate the voltage drop (V) and power dissipation (P) ***using procedure call (equivalent to C++ user defined function).*** The value of Resistance (R) and current (I) should be contained in register R2 and R3, respectively. The value of voltage drop (V) and power dissipation (P) will be contained on Register R8 and R9, respectively. You should name the file as `Lab4A.S`

```
#include <iostream>
using namespace std;
int vol(int cur, int res); //function for voltage drop calculation
int pow(int cur, int res); //function for power dissipation calculation

int main()
{
	int cur, res, voltage, power;

	//prompt for and read in current value
	cout<<"Enter the current values: ";
	cin>>cur;

	//prompt for and read in resistance value
	cout<<"Enter the resistance values: ";
	cin>>res;

	//call functions
	voltage = vol(cur,res);
	power= pow(cur,res);

	//Showing results in the screen
	cout<<"\nThe votage drop is: "<<voltage;
	cout<<"\nThe power dissipation is: "<<power;

	return 0;
}

//Function for voltage drop calculation
int vol(int cur, int res)
{
	return(cur*res);
}
```

```
// Function for power dissipation calculation
int pow(int cur, int res)
{
        return(cur*cur*res);
}
```

Sample Output:

```
Enter the current values: 3
Enter the resistance values:2
The voltage drop is: 6
The power dissipation is: 18
```

You can check the code here: https://www.onlinegdb.com/online_c_compiler

Q2. The following c program computes $y = \sum_{n=0}^{a} x^n$, where x, and a are user's input. Write an assembly program and simulate it on ARMSim to calculate the value of y. The value of x and a should be contained on register R2 and R3, respectively. The computed value of y will be contained on Register R9, respectively. You should name the file as `Lab4A.S`

```
#include <iostream>
using namespace std;
int main()
{
        // Declaring variables
         int x, a, store = 1, total = 1;
         int n;

          // Prompt for and read in user input x
          cout<<"\nEnter the value for x: ";
          cin>>x;
          // Prompt for and read in user input a
          cout<<"\nEnter the value for a: ";
          cin>>a;

         //for loop to calculate summation
         for(n = 1; n<= a; n++)
         {
                 //(x)^n
                 store = store*x;

                 // adding next value in summation to total
```

```
            total = total + store;
        }

        // Showing the result in the screen
        cout<<"\nThe value of y is = " <<total;

        return 0;
}
```

SAMPLE OUTPUT 1:

```
Enter the value for x:2
Enter the value for a:2
The value of y is =7
```

SAMPLE OUTPUT 2:

```
Enter the value for x:3
Enter the value for a:1
The value of y is =4
```

You can check the code here: https://www.onlinegdb.com/online_c_compiler

SUBMISSION PROCEDURE: **You can simply upload** `Lab4A.S` and Lab4B.S **files on the Canvas.**