# Week 1 Lab Work Practice Questions

**1.** Write a program that calculates the accrued total amount given a principal amount and time period in years. The accrued total amount is calculated as

totalAmount = principalAmount * (1.0 + rateOfInterest * timePeriod)

For the rate of interest use the following table:

| Principal Amount (p) | Rate of Interest |
|---|---|
| 0.00 ≤ p < 1000.00 | 0.025 |
| 1000.0 ≤ p < 10,000.00 | 0.020 |
| 10,000.00 ≤ p < 100,000.00) | 0.015 |
| P >= 100,000.00 | 0.010 |

The program will proceed as follows:

- Ask the user for the principal amount
- Ask the user for the number of years
- If principal amount is less than 0 or the number of years is less than 0, then print an error message and do nothing
- Else, calculate the accrued total amount and print it

**2.** The following two programs are designed to give the letter grade of a student for a given total course mark as integer value out of 100. Assume the value of mark is always between 0 and 100. The intended letter grade assignment is [90, 100] = 'A', [75, 90) = 'B', [65, 75) = 'C', [50, 65) = 'D' and [0, 50) = 'F'.

**Program1.py**

```
mark = float(input("Enter mark "))
if (mark >= 90):
    lg = 'A'
elif (mark >= 75):
    lg = 'B'
elif (mark >= 65):
    lg = 'C'
elif (mark >= 50):
    lg = 'D'
else:
    lg = 'F'
print("Letter Grade =", lg)
```

**Program2.py**

```
mark = float(input("Enter mark
"))
if (mark >= 90):
    lg = 'A'
if (mark >= 75):
    lg = 'B'
if (mark >= 65):
    lg = 'C'
if (mark >= 50):
    lg = 'D'
else:
    lg = 'F'
print("Letter Grade =", lg)
```

One of the two programs has semantic error. Which one is it? Circle your answer:

**Answer:** **Program1.py** **Program2.py**

The two programs do sometimes give the same output for some selected input value for mark. Give an example of input value for the variable mark for which the two programs will give the same output.

**Answer:**_____

The two programs do sometimes give different outputs for some selected input value for mark. Give an example of input value for the variable mark for which the two programs will give different outputs.

**Answer:**_____

3. An employee is paid at a rate of $16.78 per hour for the first 40 hours worked in a week. Any hours over that are paid at the overtime rate of one and-one-half times that. From the worker's gross pay, 6% is withheld for Social Security tax, 14% is withheld for federal income tax, 5% is withheld for state income tax, and $10 per week is withheld for union dues. If the worker has three or more dependents, then an additional $35 is withheld to cover the extra cost of health insurance beyond what the employer pays. Write a program that will read in the number of hours worked in a week and the number of dependents as input and will then print the worker's gross pay, each withholding amount, and the net take-home pay for the week.
4. Write a program that declares five integer variables, reads in five integers, and then outputs the sum of only the positive inputs, the average of only the positive inputs, the sum of only the negative inputs, the average of only the negative inputs, the sum of all the inputs, and the average of all the inputs.
5. Write a Python program that prints randomly one of the following three messages: **Yes**, **No** or **Not-Sure**.
6. **Which Pizza to buy!** Pizza sizes are given as the diameter of the pizza in inches. However, the quantity of pizza is determined by the area of the pizza, and the area is not proportional to the diameter. Most people cannot easily estimate the difference in area between a 10-inch pizza and a 12-inch pizza and so cannot easily determine which size is the best buy—that is, which size has the lowest price per square inch.

   Write a Python program that does the following:

   - Reads four float values representing the diameter of the smaller pizza, the diameter of the larger pizza, the price of the smaller pizza, and the price of the larger pizza
   - Compute the area of each pizza in the variables
   - Compute the price per square inch for each pizza and determine which pizza is a better buy.

   NOTE: The pizza that has lower price per square inch is the better buy.