**CYPRUS INTERNATIONAL UNIVERSITY**
**FACULTY OF ENGINEERING**
**CMPE112, CPE 112, CTPR112, ITEC112, MISY112, IT112, COMP112**
**Lab Exercises**

Chapter 2: C/C++ program flow, input & output operations and control structures.

**Please solve the following questions via C/C++ programming.**
**You can use any IDE you like.**

**The Dev C++ is available for PC and can be downloaded at:**
**http://www.bloodshed.net/devcpp.html**

**The CodeBlocks is a Linux friendly IDE and is available at:**
**http://www.codeblocks.org/**

**XCode is Mac development environment for free and can be downloaded at:**
**https://developer.apple.com/xcode/**

## Sequence in programming: basic input, process, output questions

1- Write a complete C++ programming that would get two integer numbers and calculate their sum.

**Sample output:**

```
Please enter number1: 5
Please enter number2: 10
Sum is: 15
```

2-Write a complete C++ program to prompt the user to input his/her age and calculate when the year the user was born according to the current year.

**Sample output:**

```
Please enter your age: 23
You have born in 1995
```

3- Write a complete C++ program to prompt the user to input 3 integer values and display these values both in forward and reverse order as shown below.

**Sample output:**

```
Please enter Value1: 5
Please enter Value2: 10
Please enter Value3: 15

Values in forward:
5,10,15

Values reverse order:
15,10,5
```

4- Write a complete C++ program which accept principal (main money), interest rate (rate of interest for each year) and time (year) from user and calculate how much interest that user will take at the end of the time (year). Then display the result on the screen. The interest formula is given below:

**Formula:**

**Interest = (Principal * rate * time) / 100**

**Sample output:**

```
Please enter principal: 1800
Plesase enter rate: 5
Please enter time: 3
Simple Interest is: 270
```

5- Write a complete C++ program to prompt user to input radius and height of a cylinder in order to calculate the volume of that cylinder. The volume formula is given below:

**Formula:**

$$V = \pi r^2 h$$

**Sample output:**

```
Please enter radius: 5
Please enter height: 10
Volume of the cylinder is: 785
```

6- Write a complete C++ program to prompt the user to input radius of a circle and calculate the area according to the given formula below:

**Formula:**                     **Sample output:**

$$A = \pi r^2$$

```
Please enter radius of the circle: 5
Area of the circle is: 78.5
```

7- Write a complete C++ program to prompt user to input radius of a sphere and calculate the volume of the sphere according to the formula given below:

**Formula:**                     **Sample output:**

$$V = \frac{4}{3}\pi r^3$$

```
Please enter the radius of the sphere: 6
Volume of the sphere is: 904.32
```

8- Write a complete C++ program to prompt user to input 2 angle of a triangle and find the third angle according to the entered 2 angles. Notice that the sum of the angles of a triangle is always 180.

**Sample output:**

```
Please enter the value of angle1: 45
Please enter the value of angle2: 90

Angle1 is: 45
Angle2 is: 90
Angle3 is: 45
```

9- Write a complete C++ program to prompt user to input the distance in kilometer per hour and calculate the equivalent miles per hour. Hint: 1 km/hr = 0.6213712 ml/hr.

**Sample output:**

```
Please enter the distance in kilometer: 25
The mile per hour of 25 km/hr is 15.5343 ml/hr
```

10- Write a complete C++ program that prompts 4 whole numbers as input, calculates and display average of them.

**Sample output:**

```
Please enter number1: 5
Please enter number2: 10
Please enter number3: 15
Please enter number4: 20
Average: 12
```

11- Write a complete C++ that prompts the user to enter 2 whole numbers. Having done so, divide the first number by the second number and display the result on the screen.

**Sample output:**

```
Please enter number1: 20
Please enter number2: 4
20/4 = 5
```

## Decision making and Control structures

12- Write a complete C++ program that prompts the user to input two integer values and find the greatest of the two values.

**Sample output:**

```
Please enter number1: 2
Please enter number2: 4
Biggest Number is: 4
```

13- Write a complete C++ program to get *cost price* and *selling price* of a product. According to given inputs calculate total profit, if total profit is less than 0 display "Loss" else display "Profit".

**Sample output:**

```
Please enter the cost of the product: 200
Please enter the price of the product: 220
Profit
```

14- Assume that you want to create an algorithm for a toy seller company. The company sells only one type of toy which is "Spider-Man toy robot" and the price is 20$. Write a complete C++ program to get the number of Spider-Man toy robot" that user want to buy and display total price that user have to pay. If total price is more than 100 make ten percent discount on total price.

### Sample output:

```
Please enter number of toys you want to buy: 6
Discount! Total price is: 108
```
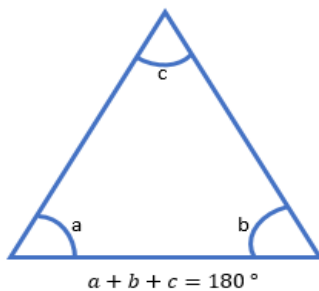
15- Write a complete C++ program that would get a number from the user in between 1 and 7. Having done so the program would associate the number with a day of the week which would be displayed as the output. The associations are given below:

1- Monday
2- Tuesday
3- Wednesday
4- Thursday
5- Friday
6- Saturday
7- Sunday

### Sample output:

```
Please enter the day of the week(1-7): 2
Tuesday
```

16- Write a complete C++ program that would get 3 angles of the triangle and check if the sum of the angle is valid for triangle. A triangle is said to be a valid triangle if and only if sum of its angles is 180°. None of the angle can be 0°.

### Sample output:



$$a + b + c = 180°$$

```
Please enter angle1: 20
Please enter angle2: 150
Please enter angle3: 0
Sum: 170
Triangle is not valid
```

17- Write a complete C++ program that prompts the user to input number of cars that he/she has. Having done so, display the following message according to the following table:

| Car | Message |
|---|---|
| $10 \leq car$ | You are rich! |
| $2 \leq car < 10$ | I Think You are earning really well. |
| $0 < car$ | Nice. |

## Sample output:

```
Please enter how many cars do you have: 15
You Rich!
```

18- Write a complete C++ program that performs the operations of a standard calculator (+, - , *, /, %). The user should enter two operands and an arithmetic operator. According to these inputs, the result of the operation should be displayed on the screen.

```
Enter operand1: 5
Enter operator:  %
Enter operand2:  4

Result of 5%4 is 1
```

19- Write a complete C++ Program that gets the age of a student and displays a message according to the below table.

| Age | Message |
|---|---|
| <50 | You are young |
| 50<= <=75 | Don't worry, you are not that old |
| >75 | You are really old dude |

20- Write a complete C++ program which would offer a menu of choices to user regarding what type of food they would like to order. Having taken the choice of the user on food, the program would ask how many of that order the user wants and calculate the total price that needs to be paid. The food menu and the sample run of the program is given below:
(**Greens are user inputs  yellow is the output**)

```
**Food Menu**
1-> Pasta (6$)
2-> Hamburger (7$)
3-> Pizza (10$)

Select which food type do you want to order (1-3): 2

How many Hamburgers would you like to order? : 3

Total Pay = 21$
```