

# Programming Fundamental

## Assignment - 03

### Instructions:

- It is individual assignment, so try to do it by yourself.
- Assignment should be in zip file named as RollNumber\_Name\_PF.zip and name of your file should be according to tasks given in this assignment.
- Assignment should be submitted on google class room before deadline **23, September 2022, 11:59pm**. Late submissions will not be considered.
- Email subject must contain **PF\_Assignment -03**.
- Feel free to ask any question.
- Total marks of assignment are 100, 10 each.

### Task# 01:

**(Displaying Shapes with Asterisks)** Write a program that prints a box, an oval, an arrow and a diamond as follows:



### Task# 02:

**(Digits of an Integer)** Write a program that inputs a five-digit integer, separates the integer into its digits and prints them separated by three spaces each. [Hint: Use the integer division and modulus operators.] For example, if the user types in 42339, the program should print:

4 2 3 3 9

**(Table)** Using the techniques learned in class until now, write a program that calculates the squares and cubes of the integers from 0 to 5.

Use tabs to print the following neatly formatted table of values:

Integer	square	cube
0	0	0
1	1	1
2	4	8
3	9	27
4	16	64
5	25	125

### Task# 03:

**(Car-Pool Savings Calculator)** Research several car-pooling websites. Create an application that calculates your daily driving cost, so that you can estimate how much money could be saved by car-pooling, which also has other advantages such as reducing carbon emissions and reducing traffic congestion. The application should input the following information and display the user's cost per day of driving to work:

- Total miles driven per day.
- Cost per gallon of gasoline.

- c) Average miles per gallon.
- d) Parking fees per day.
- e) Tolls per day

#### Task# 04:

**(Male and Female Percentages)** Write a program that asks the user for the number of males and the number of females registered in a class.

The program should display the percentage of males and females in the class.

#### Task# 05:

**(Ingredient Adjuster)** A cookie recipe calls for the following ingredients:

- 1.5 cups of sugar
- 1 cup of butter
- 2.75 cups of flour

The recipe produces 48 cookies with this amount of the ingredients.

Write a program that asks the user how many cookies he or she wants to make, then displays the number of cups of each ingredient needed for the specified number of cookies.

#### Task# 06:

**(Box Office)** A movie theater only keeps a percentage of the revenue earned from ticket sales. The remainder goes to the movie distributor.

Write a program that calculates a theater's gross and net box office profit for a night.

The program should ask for the name of the movie, and how many adult and child tickets were sold.

(The price of an adult ticket is \$10.00 and a child's ticket is \$6.00.)

It should display a report similar to:

Movie Name:	"Wheels of Fury"
Adult Tickets Sold:	382
Child Tickets Sold:	127
Gross Box Office Profit:	\$ 4,582.00
Net Box Office Profit:	\$ 916.40
Amount Paid to Distributor:	\$ 3,665.60

Assume the theater keeps 20 percent of the gross box office profit.

### Task# 07:

If you have two fractions,  $a/b$  and  $c/d$ , their sum can be obtained from the formula

$$\frac{a}{b} + \frac{c}{d} = \frac{a*d + b*c}{b*d}$$

For example,  $1/4$  plus  $2/3$  is

$$\frac{1}{4} + \frac{2}{3} = \frac{1*3 + 4*2}{4*3} = \frac{3 + 8}{12} = \frac{11}{12}$$

Write a program that encourages the user to enter two fractions, and then displays their sum in fractional form. (You don't need to reduce it to lowest terms.) The interaction with the user might look like this:

```
Enter first fraction: 1/2
Enter second fraction: 2/5
Sum = 9/10
```

You can take advantage of the fact that the extraction operator ( $>>$ ) can be chained to read in more than one quantity at once:

```
cin >> a >> dummychar >> b;
```

### Task# 08:

You can convert temperature from degrees Celsius to degrees Fahrenheit by multiplying by  $9/5$  and adding 32. Write a program that allows the user to enter a floating-point number representing degrees Celsius, and then displays the corresponding degrees Fahrenheit.

### Task# 09:

By default, output is right-justified in its field. You can left-justify text output using the manipulator `setiosflags(ios::left)`. (For now, don't worry about what this new notation means.) Use this manipulator, along with `setw()`, to help generate the following output:

Last name	First name	Street address	Town	State
Jones	Bernard	109 Pine Lane	Littletown	MI
O'Brian	Coleen	42 E. 99th Ave.	Bigcity	NY
Wong	Harry	121-A Alabama St.	Lakeville	IL

### Task#10:

A serial transmission line can transmit 960 characters a second. Write a program that will calculate how long it will take to send a file, given the file's size. Try it on a 400MB (419,430,400 byte) file. Use appropriate units. (A 400MB file takes days.)