



**Faculty of Information Technology,
University of Moratuwa
BScHons (IT) and BScHons (AI)
IN 2101 – Object-oriented programming**

Objective

Write java programs that make use of **Java Classes, Objects, Object Creation, Primitive Data Types, Variables, Methods, Arithmetic Operators, Casting**

Exercises

Q1.

1. Create a class called Temperature
2. Declare two variables named as follows inside of the main method.(data type of the variable should be double)

fahrenheit = 212

celsius = 98.5

3. Write a java program to convert temperature from fahrenheit to celsius and celsius to fahrenheit and print the values as follows
 - Fahrenheit value before converting to celsius
 - Fahrenheit value after converting to celsius
 - Celsius value before converting to fahrenheit
 - Celsius value after converting to fahrenheit

Hint -

$$(C/5) = (F-32)/9$$

C = Celsius , F = Fahrenheit

Q2.

1. Create a class called FindAverage
2. Declare three variables named as X,Y,Z as double values inside of the main method and assign values as below
X=10, Y=5, Z=15
3. Create a method to calculate the average of the above three values inside of the FindAverage class.
4. Print the average value of X,Y,Z inside of the main method.

Hint -

Average = (sum of the values/number of values)

Q3. 1. Create a class named as Cast

2. Declare the variables by considering the following given values

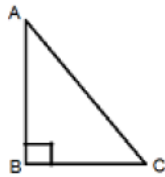
X = 5

Y = 10.5

3. Do the following tasks

1. Convert X value in to double
2. Convert X value in to long
3. Convert X value in to float
4. Use the value which after converting to long in step 2 and convert the long value to float
5. Convert Y value to int
6. Convert Y value in to long

Q4. ABC is a right angled triangle



AC = Hypotenuse

AB = Height

BC = Base

- a. Create a class called Triangle.
- b. Inside the Triangle class declare three instance variables named as height, base, hypotenuse (Variables should be declared as double)
- c. Triangle class has 3 methods as follows. Create and develop the following methods inside of the class Triangle
 1. FindArea() - To find the Area of the right angled triangle
 2. FindHypotenuse() - To find the Hypotenuse of the right angled triangle
 3. FindPerimeter() - To find the Perimeter
- d. Create another class named as Demo with the main method
- e. Create an object from Triangle class
- f. Through the created object pass , height value as 4.0 and base value as 3.0
- g. Through the created object call above three methods (which were created inside of the Triangle class) and display the output.

Hint -

- Area of the right angled triangle = $0.5 * \text{Height} * \text{Base}$
- To calculate the Hypotenuse value you can use Pythagoras Theorem
Formula
 $AC^2 = AB^2 + BC^2$
In java to find the square root you can use **Math.sqrt()** function
To get the power value you can use **Math.pow(X,Y)** function ; X= value,Y= power
Eg - : $AC^2 = \text{Math.pow}(AC,2)$

- Q5.** a. Create a Java class named as 'Swap'
- b. Declare two variables named as X and Y (Data type of the variables should be Integer)
 - c. Then assign X's Value as 15 and Y's Value as 5
- 1) Swap X and Y using a third variable named as Z and print the below outputs.
 1. X,Y values before swap
 2. X,Y values after swap

Note: Comment or Undo part 1 before moving to part 2
 - 2) Swap X and Y without using a third variable and print the below outputs.
 1. X,Y values before swap
 2. X,Y values after swap

Q6.

- a. Create a class called Calculator.
- b. Inside the Calculator class declare two instance variables named as number1 and number2(Variables should be declared as int)
- c. Calculator class has 5 methods as follows. Create and develop the following methods inside of the class Calculator
 1. Addition() - To Add two values
 2. Subtraction() - To Subtract two values
 3. Multiplication() - To Multiply two values
 4. Division() - To divide two values
 5. Modulus() - To get the modulus after dividing two values
- d. Create another class named as Demo with the main method
- e. Create an object from Calculator class
- f. Through the created object pass , number1 value as 12 and number2 value as 5
- g. Through the created object call above Five methods (which were created inside of the Calculator class) and display the output.