



## Programs for Practice

### WEEK 1: Lab class 1

1. Write a program to print “hello world”?
2. Write a program to show the results of addition, subtraction, multiplication, division, and average of two variables x=10 and y=5?
3. Write a program to create a student class and access the class attributes like studentID and mark using object of class student?
4. Write a program to create a student class and access the class attributes like studentID and mark where mark is static variable? (hint: access the static variable using class name)
5. Write a program to access a sum() in student class through object. The sum function add two variables a and b and prints the sum result? (hint: a and b variables are instance variables of class student)

### Week 2: Lab class 2

1. Write a program to show typecasting by converting an integer variable to byte?
2. Write a program to show the use of arithmetic operators such as +, -, \*, /, %, ++, and --?
3. Write a program to show the use of bitwise operators: &, |, and ^ by taking two variables x =5 and y=2?
4. Write a program to check the eligibility to vote?
5. Write a program to find the grade of a student if s/he scores 67 in a subject?
6. Write a program to check whether the average of 43,54,53,75,67,89, is greater than 60?
7. Write a program to check the entered password=1234 is correct or not (use scanner class)?
8. Write a program to check a number as prime or not?

### Week 3: Lab class 3

1. Write a program to declare a 1D array and insert some elements and print the elements?
2. Write a program to declare a 1D array and insert some elements using for loop & Scanner class and print the elements using for loop?
3. Write a program to find the location (index value) of a user entered number using Scanner class, in a 1D array with some elements?
4. Write a program to find the average of the elements in an array?
5. Write a program to add two arrays A and B, store it in another array C, and print the elements in array C?
6. Write a program to add 5 with each element of the array and print the values of the updated array.
7. Write a program to find the middle element in the odd size and even size array?
8. Write a program to count the number of 1s and number of 0s in a 1D array with 8-bit elements  
ex. A={0,1,1,1,0,0,0,0,}?

### Week 4: Lab class 4

1. Write a program to print the value of the below matrix using for loop?

1	2
6	3

2. Write a program to insert values to a 2D matrix of size 3\*3 using Scanner class and for loop?


3. Write a program to search 35 in the below matrix and also print the location of it (index value)?

23	34	67
25	35	36
37	12	4

4. Write a program to count the number of zeros and ones in the below matrix?

0	0	0
0	0	1
1	1	0

5. Write a program to find the average of the below matrix?

23	34	67
25	35	36
37	12	4

6. Write a program to swap the elements of 1<sup>st</sup> column with 3<sup>rd</sup> column?

23	34	67
25	35	36
37	12	4

7. Write a program to swap the elements of 2<sup>nd</sup> row with 3<sup>rd</sup> row?

23	34	67
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25	35	36
37	12	4

8. Write a program to find the diagonal elements of the matrix?

23	34	67
25	35	36
37	12	4

9. Write a program to add below two matrices and print the resultant matrix?

23	34	67
25	35	36
37	12	4

5	6	8
3	9	2
7	4	4

10. Write a program to multiply below two matrices and print the resultant matrix?

2	4	6
5	3	6
7	1	4

5	6	8
3	9	2
7	4	4

1. Write a program to create a default constructor to print "Hello World"?
2. Write a program to create a default constructor to add, multiply, subtract, and divide two values a=10, b=5, and print the values?
3. Write a program to create a parameterized constructor to assign values (roll, name, age) to three students and print these details in another method?
4. Write a program to implement constructor overloading to calculate the area of square (side=10) and rectangle (length=10, breadth=5) by using parameterized constructor and print the details in another method?
5. Write a program to access static variables a=7 and b=8 and print the addition of them in Main method?
6. Write a program to access static method which add, multiply, subtract, and divide two values a=10, b=5, and print the results in that static method only?

#### **Week 6: Lab class 6**

1. Write a program to show the use of **this keyword** in constructor (Addition(int x,int y)) of a class name Addition for adding and multiplying two values? Solve using parameterized constructor.
2. Write a program to create **Array of Objects** of 5 employees with Class employee containing variables like Name, Employee ID, Age, Position, and Salary and a method to display these details of employee?
3. Write a program to show that a **private variable and private method** is accessible within a class?
4. Write a program to show that a **private method and variable** are not accessible from outside the class?

5. Write a program to show that a **default variable and default method** can be accessed within a package?
6. Write a program to show that a **default variable and default method** cannot be accessed outside a package?
7. Write a program to show that a **protected variable and default method** can be accessed from outside the package? Use inheritance for making subclass.
8. Write a program to show that a **public class, variable and method** can be accessed from outside of the package?

### **Week 7: Lab 7**

1. Write a program to create a class "University" with a method to print University name, and create a child class "College" of it with method "show()" to print College name? (using obj. of the child class, access the methods of parent and child) **(Single Inheritance)**
2. Write a program to create a class "University" with a variable University name and create a child class "College" with a variable "college name" and a method "show()" to assign names and print the names of both University and college? (using obj. of child class, access the method of parent) **(Single Inheritance)**
3. Write a program to create a class "Addition" with a method to print the sum of numbers between 100 to 150 and create a child class "sum" to access the parent class method to print the sum? (using obj. of the child class, access the method) **(Single Inheritance)**
4. Write a program to create a class "S" with sum(int x, int y) and create a child class of S as "M" with multiplication(int a, int b) and again create a child class of M as "SM" to access these two methods with a object to print the sum and multiplication? (pass the values as arguments to the methods) **(Multilevel Inheritance)**

5. Write a program to create a class "viruseffect" with a method "symptoms()" to print the symptoms, create a child class "alphavirus" and another child class "betavirus". From betavirus class access the method symptoms() using alphavirus object and betavirus object to print the symptoms? (Hierarchical Inheritance)
6. Write a program to create a class "University" with a variable "name" and create a child class "College" with same name variable "name" and a method "show()" to assign names to both parent class variable (using Super keyword) and child class variable? (using obj. of child class, access the method of child)
7. Write a program to create a class "University" with a variable "name" and method "details()" to assign and printing the name. Create a child class "College" with same name variable "name" and same method name "details()". In the child class details(), call parent class details() (using Super keyword), then assign name to child class variable, and print child details? (using obj. of child class, access the method of the child)

### Week 8: Lab 8

1. Write a program to create a class "University" with a variable "name" and method "University()" (as constructor) to assign and printing the name (university). Create a child class "College" with same name variable "name" and method name "College()" (as constructor). In College(), call parent class University() (using Super() ), then assign and print college name. Using obj. of child class, access the method of the child class to print university and college names.
2. Write a program using Method Overloading (Static Polymorphism) to overload display() for printing an integer, a float, a double, and a character? (Pass the values as arguments to the display() from main method).

3. Write a program using Method Overriding (Run time Polymorphism/dynamic method dispatching) to override Purpose() for Parent Class "Defence". It has three child class "Navy", "Airforce", and "Army"? Create objects of each class in class main and access the Purpose() respectively to print the purpose of the defence class element (navy,airforce,army).

### **Week 9: Lab 9**

1. Write a program to join two strings in String class using concat() and show the output?
2. Write a program to join two strings in String class using + operator and show the output?
3. Write a program to check the contents of two strings as equal or not using equals() and Boolean value?
4. Write a program to check if two strings variables refer to the same string object using == operator and Boolean value?
5. Write a program to compare two strings using compareTo() and print the output?
6. Write a program to find a character in a string at a particular index value using charAt()?
7. Write a program to find the index value of 'e' in string "HelloPMeC" using indexOf()?
8. Write a program to find the index value of 'e' in string "HelloPMeC" using indexOf() if searching starts from index = 2?
9. Write a program to find the index value of a substring "loP" in string "HelloPMeC" using indexOf()?
10. Write a program to find the index value of a substring "loP" in string "HelloPMeC" using indexOf() if searching starts from index=5?
11. Write a program to count the no. of words in a string using charAt() and length()?
12. Write a program to count the number of same word in a string?
13. Write a program to replace a word in a string with another word using replace()?



14. By using StringBuffer class modify the stringbuffer object => "Hello" to "HelloElectrical" using append()?

**Week 10: class 10**

1. Write a program to count the number of words in a string using one StringTokenizer class method and Space as the delimiter?
2. Write a program to print the tokens in a string using Space as the delimiter?
3. Write a program to show autoboxing by changing Integer to object using Wrapper class?
4. Write a program to show unboxing by changing object to Integer using Wrapper class?
5. Write a program to create abstract class X and an abstract method "computation" and define the computation method in a subclass Y which can do multiplication, addition, subtraction and division of any two integers. By using object of the subclass Y access the computation method to print the all computation results?

## Week 11: Class 11

1. Write a program to show if final keyword is used for a variable  $x=10$ , then can we change the variable by assigning a new value?
2. Write a program to show if final keyword is used for a method Student(), then can we override the content of that method?
3. Write a program to show if final keyword is used for a Class X, then can we extend the class X with subclass Y?
4. Write a program to create a package with name "Placement" and make two classes such as "Written" and "Interview" with its attributes in the same package?
5. Write a program to create another package with name "PlacementAtCollege" and import the above classes attributes for recruitment at PMEC in class "College"?
6. Write a program to create a subpackage "Question" with class "Question Set" in the "Placement" package and import it to "PlacementAtCollege" package for use in class "College"?

### **Class 12 Week 12:**

1. Write a program to create one interface "Employee" with attributes of an employee like id, name, age, and salary also it contains a method salary(). In the child class implement the interface to print all details of the employee by calling salary().
2. Write a program to handle divide by zero exception using try and catch block.
3. Write a program to handle Array index out of bound exception if there are 3 elements in an array A and we want to print A[5] using try and catch block?

### **Class 13 Week 13:**

1. Write a program to show **multiple catch blocks** with exception classes: ArrayIndexOutOfBoundsException and Exception (generic class) for handling the exception divide by zero case.
2. Write a program to create a class X with a method Y() to **throw** one exception ArithmeticException with message "Exception is Thrown", handle it and then call the method to show the message in main method.
3. Write a program to create a class X with a method Z() to create a list of probable exception: ArrayIndexOutOfBoundsException using **throws**. Inside Z() throw this exception with message "test exception". Then call the method Z() in try block and handle it (in main method).
4. Write a program using **finally block** to print the average of 5 numbers using for loop. Before that show an exception in try block (divide by zero) which is not handled using any catch block.

## **Class 14: Week 14**

1. Write a program to create a simple thread to find the average of two numbers?
2. Write a program to see whether a thread is Alive or not?
3. Write a program to create two threads which can print the multiplication and addition of two numbers ( $x=10$ ,  $y=2$ ), however after one operation (multiplication) that thread will sleep/wait for 500 ms. Do not use Join() and print the results
4. Write a program to create two threads which can print the multiplication and addition of two numbers ( $x=10$ ,  $y=2$ ), however after one operation (multiplication) that thread will sleep/wait for 500 ms. Use Join() to a thread to see the results.
5. Write a program to get the name of a thread running?
6. Write a program to get the name of current thread running?
7. Write a program to set a name "pmec" to a thread?
8. Write a program to create three threads, start all and print the priority of each thread?
9. Write a program to create a thread and print its maximum (for ex. `t.MAX_PRIORITY`, if t is an object), normal and minimum priority?



## Class 15: Week 15

1. Write a program to create 10 threads, run, and set priority using `setPriority()` and print which thread is currently running.
2. Write a program to read a character (`read()`) by using `BufferedReader` class and `InputStreamReader` class.
3. Write a program to read a string (`readLine()`) input from the keyboard using `BufferedReader` class and `InputStreamReader` class.
4. Write a program to create a List and add 5 products into it and print the details of the list.
5. Write a program to create a Set and add 5 products into it and print the details of the Set.
6. Write a program to create a Map and where add keys of the 5 products with their names into it and print the details of the Mapping using `getKey` and `getValue` methods.