VASIREDDY VENKATADRI INSTITUTE OF TECHNOLOGY:: NAMBUR

# MID TERM ASSIGNMENT
## ACADEMIC YEAR:2020 TO 2021

**Hall Ticket No.** : | 1 | 9 | B | Q | 1 | A | 0 | 5 | F | 8 |

**Name of the Student** : NALLAMOTHU HEMANTH

**Course** : B-TECH

**Branch** : **ECE/CSE/EEE/IT** ✓

**Subject** : JAVA PROGRAMMING

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## ASSIGNMENT / MARKS DETAILS

| To be filled by the Student | | | To be filled by the Subject Teacher | | |
|---|---|---|---|---|---|
| ***Submission Date*** | ***Assignment*** | ***Signature of the Student*** | ***Max Marks*** | ***Marks Obtained*** | ***Signature of Subject Teacher*** |
| 21/09/2020 | 1 | N.Hemanth | 5 | | |

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## INSTRUCTIONS TO THE STUDENTS

1. The assignment should be submitted to the subject teacher on or before the given schedule.
2. Answer should be written on both sides of the paper.

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## INSTRUCTIONS TO THE SUBJECT TEACHER

1. The Subject teacher has to value with red ball point pen only.
2. The Subject teacher should award the marks on the left hand side of the margin and at the end of the each answer.
3. Do not correct the marks by overwriting or by scratching and writing.
4. The Subject teacher has to post marks in the space provided.

# Assignment - 1

1. Write about the role of JVM, JAVA API in developing the platform independent java program with suitable example.

A)

## Role of JVM in JAVA

JVM stands for Java Virtual machine which is abstract or virtual computing machine is the implementation of Java virtual machine specification. It interprets the compiled java code know as the byte code and helps in program execution depending upon the specific platform.

Java is platform independent language i.e., it can run on any plat form without rewriting the code. This feature is supported by JVM.

Each JVM has:-

* A Instruction set.
* A stack
* A garbage collection heap
* Method area
* A set of registers
* An Execution Environment

Basically JVM is set of Computer programs and data structures that run compiled byte code on

any machine making Java "compile once, run anywhere"

JVM converts the byte code into Machine (or) platform specific code and then runs it.

Steps in JVM implementation:-

* Loads the class file.
* check whether .class file has the required byte code.
* Interprets the byte code and convert them into machine specific code.
* Removes useless objects and do garbage collection.

Source code (Program.java) ---- compile ----> Byte code (Programs.class)

Byte code ---- JVM ------> Machine code

## JAVA API

An application programming Interface (API) in the context of java, is a collection of prewritten packages, classes and Interfaces with their respective methods, fields and Constructors. similar to a User interface, which facilitates interaction between humans and computers, an API serves as a software program interface facilitating interactions

The API is a library of available Java classes, packages and interfaces. The API's helps programming task mostly in JAVA by classes and packages which are helpful in minimising the number of lines written within pieces of code. The official API includes packages, e.g., applet packages, graphics and GUI swing packages, input/output (IO) packages and abstract windows toolkit (AWT).

```
import java.util.*;
```

The import statement imports all classes in the API's java.util package and makes them available to program.

2) With an example program explain the concept of classes and nested classes in java.

A) Classes:-

A class describes what the object will be, but it seperate from the object itself. In other words, classes can be described as blue prints, descriptions (or) definitions for an object you can use the same class as a blue print for creating multiple objects. The first step is to define the class, which then becomes a blue print for object creation.

Each class has a name and each is used to define attributes and behaviour.

Attributes Eg:- name, height, weight, gender, age

Behaviour Eg's:- Work, run, sleep, jump, speak.

* Each class has a different types of instance variables, constructors, setters and getters, and methods

Eg:-

```
Public class Train {
        Void sound(){
            System.out.println("chuk....chuk");
        }
}
```

*

* we declared a sound() method in our class Train
* In order to use class and its method we need to declare an object of class

```
class MyClass {
    Public static Void main(string args[]){
            Train goods = new Train();
            goods.sound();
    }
}
```

* Now goods is an object for our class Train and we called its method bark() using object goods as goods.sound()

Output:-

chuk .... chuk

Nested Classes:-

JAVA supports nesting classes; a class can be a member of another class. We use inner class to logically group classes and interfaces in one place so that it can be more readable and maintainable. Additionally, it can access all the members of outer class including private data members and methods.

Creating an inner class is quite simple. Just write a class with in a class. Unlike a class, an inner class can be private, it cannot be accessed from an object outside the class.

Example:-

```
Public class Person{
        String name = "VVIT"
        class Hand{
                Public Void shake(){
                        System.out.println("Hi");
                        System.out.println(name);
                }
        }
}
```

→ Here, we declared an outer class person and has a variable name and an inner class Hand which has a method shake() prints

Hi
VVIT

to the screen when it is called.

3. Design a class Railway Ticket with the following description:

Instance variables / data members:

String name: to store the name of the customer
String coach: to store the type of coach customer wants to travel.
long mob no: to store customer's mobile number
int amt: to store basic amount of ticket
int totalamt: to store the amount to be paid after updating the original amount.

Methods:

void accept(): to take input for name, coach, mobile number and amount.
void update(): to update the amount as per the coach selected. Extra amount to be added in the amount as follows:

| Type of Coaches | Amount |
|---|---|
| First_AC | 700 |
| Second_AC | 500 |
| Third_AC | 250 |
| sleeper | None |

void display(): To display all details of customer such as name, coach, total amount and mobile number.

Write a main() method to create an object of the class and call the above methods.

A)

```
import java.util.Scanner;
Public class Railway Ticket {
    String name;
    string coach;
    long mobno;
    int amt;
    int totalamt;
    int no;
    Scanner sc = new Scanner (System.in);
    Public Railway Ticket (){
        // TODO Auto-generated constructor stub
    }
    public Void accept(){
        System.out.println("Enter name:");
        name = sc.nextLine();
        System.out.println("Enter coach:");
        Coach = sc.next Line();
        System.out.println("Enter mobile number:");
        mobno = sc.nextLong();
        System.out.println("Enter ticket amount:");
        amt = sc.nextInt();
    }
    public Void update (){
        System.out.println("1.First_Ac 700"+"\n"+"2.Second_Ac
                500"+"\n"+"3.Third_Ac 250"+"\n"+"4.
                sleeper None");
        system.out.println("enter your coach number");
        no = sc.nextInt();
        Switch (no){
            Case 1:
                total amt = amt +700;
                break;
            case 2:
                total amt = amt + 500;
```

```
                    break;
                case 3:
                    total amt = amt + 250;
                    break;
                case 4:
                    total amt = amt + 0;
                    break;
                default:
                    System.out.println("Enter Valid Coach Number");
            }
        }
        Public void display(){
            System.out.println("Customer Details are ....");
            System.out.println("Name: "+name);
            System.out.println("Coach: "+coach);
            System.out.println("Total Amount:"+ total amt);
            System.out.println("Mobile Number:" + mobno);
        }
        Public static void main(String args[]){
            Railway Ticket r = new Railway Ticket();
            r.accept();
            r.update();
            r.display();
        }
}
```

Input:-

```
======
Enter name :
ravi
Enter coach:
ac
```

Enter mobile number:

9912458467

Enter ticket amount:

0

1. First_Ac 700

2. Second_Ac 500

3. Third_Ac 250

4. Sleeper None

enter your coach number

1

Output:-

=====

Name: ravi

Coach: ac

Total Amount: 700

Mobile Number: 9912458467

4) Design a class to overload a function volume() as follows-

(i) double volume(double r) - with radius 'r' as an argument, returns the volume of sphere using the formula:

$V = 4/3 \times 22/7 \times r^3$

ii) double volume(double h, double r) - with height 'h' and radius 'r' as the arguments, returns the volume of a cylinder using the formula:

$V = 22/7 \times r^2 \times h$

iii) double volume(double l, double b, double h) - with length 'l', breadth 'b' and height 'h' as the arguments, returns the volume of a cuboid using the formula.

$V = l \times b \times h$

A)

```
import java.util.*;
class Main
{
  public static void main(string args[])
  {
  Java Example obj = new Java Example();
  double x = obj.volume(5);
  System.out.println(x);
  double y = obj.volume(6,7);
  System.out.println(y);
  double z = obj.volume(8,9,10);
  System.out.println(z);
  }
}
class JavaExample
{
  double volume(double r)
  {
  double v= 4/3*22/7*r*r*r
  return v;
  }
  double volume(double h, double r)
  {
  double v = 22/7*r*r*r
  return v;
  }
  double volume(double l, double b, double h)
  {
  double v= l*b*h
  return v;
  }
}
```

Output:

```
375.0
882.0
720.0
```

# VASIREDDY VENKATADRI INSTITUTE OF TECHNOLOGY, NAMBUR
## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

| Vision of the Department |
|---|
| To facilitate quality education by focusing on assimilation, generation and dissemination of knowledge in the area of Computer Science & Engineering to transform students into socially responsible engineers. |

| Mission of the Department |
|---|
| ○ Equip our graduates with the knowledge by ***student centric teaching-learning process*** and expertise to contribute significantly to the software industry and to continue to grow professionally.<br>○ To train ***socially responsible, disciplined engineers*** who work with good leadership skills and can contribute for nation building.<br>○ To make our graduates ***aware of cutting edge technologies*** and make them industry-ready engineers.<br>○ To shape the department into a ***centre of academic and research excellence***. |

| Program Educational Objectives | |
|---|---|
| **PEO-1** | To provide the graduates with solid foundation in Computer Science and Engineering along with the **fundamentals of Mathematics and Sciences** with a view to impart in them high quality technical skills like modelling, analyzing, designing, programming and implementation with global competence. |
| **PEO-2** | To prepare and motivate graduates with **recent technological developments related to core subjects** like programming, databases, design of compilers and Network Security aspects and future technologies so as to contribute effectively for Research & Development by participating in professional activities like publishing and seeking copy rights. |
| **PEO-3** | To train graduates to choose an appropriate **career in employment, higher education or entrepreneurship** by empowering them to excel in competitive examinations, by preparing them for lifelong learning and by inculcating in them ethical leadership skills. |
| **PEO-4** | To train the graduates to have basic **interpersonal skills and sense of social responsibility** that paves them a way to become good team members and leaders. |