



2022

February

Software Construction and Development

Lab 01

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Section: SE – A

QUESTION NO 01

CODE

```
import java.util.Scanner;
public class Task1 {
    public static void main(String[] args) {
        Student Amman = new Student();
        Amman.setName("Amman");
        Amman.setId(1048);
        Amman.setSubject();
        Amman.setMarks();
        System.out.println(" ");
        System.out.println("Name: " + Amman.getName());
        System.out.println("ID: " + Amman.getId());
        Amman.getMarks();
        Amman.Calculate_Grade();
    }
}
class Student {
    private String name;
    private int id;
    private double[] marks = new double[5];
    private String[] Subject = new String[5];
    private double total, percent;
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
    public int getId() {
        return id;
    }
    public void setId(int id) {
        this.id = id;
    }
    public void getMarks()
    {
        for(int i = 0; i < marks.length; i++)
        {
            System.out.println("Subject " + Subject[i] + " Marks: " + marks[i]);
        }
    }
    public void setMarks() {
```

```

        for(int i = 0; i < marks.length; i++)
        {
            System.out.println("Enter " + Subject[i] + " Marks: ");
            Scanner x = new Scanner(System.in);
            marks[i] = x.nextDouble();
        }
    }
    public void setSubject() {
        for(int i = 0; i < Subject.length; i++)
        {
            System.out.println("Enter Subject " + (i+1) + " Name: ");
            Scanner x = new Scanner(System.in);
            Subject[i] = x.nextLine();
        }
    }
    public void Calculate_Grade()
    {
        total = 0;
        percent = 0;
        for (int i = 0; i < marks.length; i++)
        {
            total = total + marks[i];
        }
        percent = (total/500) * 100;
        System.out.println("Total Marks: " + total);
        System.out.println("Percentage: " + percent + "%");
        if(percent > 70)
        {
            System.out.println("Grade: B");
        }
        else if(percent > 80)
        {
            System.out.println("Grade: A");
        }
        else if(percent > 90)
        {
            System.out.println("Grade: A+");
        }
        else
        {
            System.out.println("Fail");
        }
    }
}

```

OUTPUT

```
Problems Javadoc Declaration Console X
<terminated> Task1 [Java Application] C:\Users\Amman Soomro\.p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_17.0.2.v20220201-1208\jre\bin\javaw.exe (Feb 5, 2022, 3
Enter Subject 1 Name:
Calculus
Enter Subject 2 Name:
Maths
Enter Subject 3 Name:
Web Engineering
Enter Subject 4 Name:
Discrete
Enter Subject 5 Name:
Probability
Enter Calculus Marks:
92
Enter Maths Marks:
95
Enter Web Engineering Marks:
92
Enter Discrete Marks:
97
Enter Probability Marks:
93
Name: Amman
ID: 1048
Calculus Marks: 92.0
Maths Marks: 95.0
Web Engineering Marks: 92.0
Discrete Marks: 97.0
Probability Marks: 93.0
Total Marks: 469.0
Percentage: 93.8%
Grade: B
```

QUESTION NO 02

CODE

```
public class Task2 {

    public static void main(String[] args) {
        HumanitiesTeacher HTObj = new HumanitiesTeacher();
        ScienceTeacher STObj = new ScienceTeacher();
        MathTeacher MTObj = new MathTeacher();

        HTObj.setName("Sarah");
        HTObj.setAge(27);
        HTObj.setInstitute("FAST NUCES");
        HTObj.setTeacher("Humanities", "HRM", "Lecturer");
        HTObj.DisplayTeacherDetails();
        System.out.println(" ");
        MTObj.setName("Basit");
        MTObj.setAge(29);
        MTObj.setInstitute("NUST");
        MTObj.setTeacher("Maths", "Calculus", "Professor");
        MTObj.DisplayTeacherDetails();
        System.out.println(" ");
        STObj.setName("Maria");
        STObj.setAge(28);
        STObj.setInstitute("NED");
        STObj.setTeacher("Science", "Applied Physics", "Lecturer");
        STObj.DisplayTeacherDetails();
    }
}

class Teacher{
    private String name,institute;
    private int age;
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
    public String getInstitute() {
        return institute;
    }
    public void setInstitute(String institute) {
        this.institute = institute;
    }
}
```

```

    }
    public int getAge() {
        return age;
    }
    public void setAge(int age) {
        this.age = age;
    }
}

class HumanitiesTeacher extends Teacher{
    private String Field, CourseName, Designation;
    public void setTeacher(String F, String C, String D)
    {
        this.Field = F;
        this.CourseName = C;
        this.Designation = D;
    }
    public void DisplayTeacherDetails() {
        System.out.println("----- Humanities Teacher -----");
        System.out.println("Name: " + getName());
        System.out.println("Age: " + getAge());
        System.out.println("Institute: " + getInstitute());
        System.out.println("Field: " + Field);
        System.out.println("Course Name: " + CourseName);
        System.out.println("Designation: " + Designation);
    }
}

class ScienceTeacher extends Teacher{
    private String Field, CourseName, Designation;
    public void setTeacher(String F, String C, String D)
    {
        this.Field = F;
        this.CourseName = C;
        this.Designation = D;
    }
    public void DisplayTeacherDetails() {
        System.out.println("----- Science Teacher -----");
        System.out.println("Name: " + getName());
        System.out.println("Age: " + getAge());
        System.out.println("Institute: " + getInstitute());
        System.out.println("Field: " + Field);
        System.out.println("Course Name: " + CourseName);
        System.out.println("Designation: " + Designation);
    }
}

class MathTeacher extends Teacher{

```

```

private String Field, CourseName, Designation;
public void setTeacher(String F, String C, String D)
{
    this.Field = F;
    this.CourseName = C;
    this.Designation = D;
}
public void DisplayTeacherDetails() {
    System.out.println("----- Maths Teacher -----");
    System.out.println("Name: " + getName());
    System.out.println("Age: " + getAge());
    System.out.println("Institute: " + getInstitute());
    System.out.println("Field: " + Field);
    System.out.println("Course Name: " + CourseName);
    System.out.println("Designation: " + Designation);
}
}

```

OUTPUT

```

<terminated> Task2 [Java Application] C:\Users\Amman Soomro\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_17.0.2.v20220201-1208\jre\bin\javaw.exe (Feb 5, 2022, 4
----- Humanities Teacher -----
Name: Sarah
Age: 27
Institute: FAST NUCES
Field: Humanities
Course Name: HRM
Designation: Lecturer

----- Maths Teacher -----
Name: Basit
Age: 29
Institute: NUST
Field: Maths
Course Name: Calculus
Designation: Professor

----- Science Teacher -----
Name: Maria
Age: 28
Institute: NED
Field: Science
Course Name: Applied Physics
Designation: Lecturer

```

QUESTION NO 03

CODE

```
public class Task3 {
    public static void main(String[] args) {
        Nuclear_Bombs Object = new Nuclear_Bombs();
        Object.WeaponsDescription();
        Object.Hot_WeaponsDescription();
        Object.BombsDescription();
        Object.Nuclear_BombsDescription();
    }
}

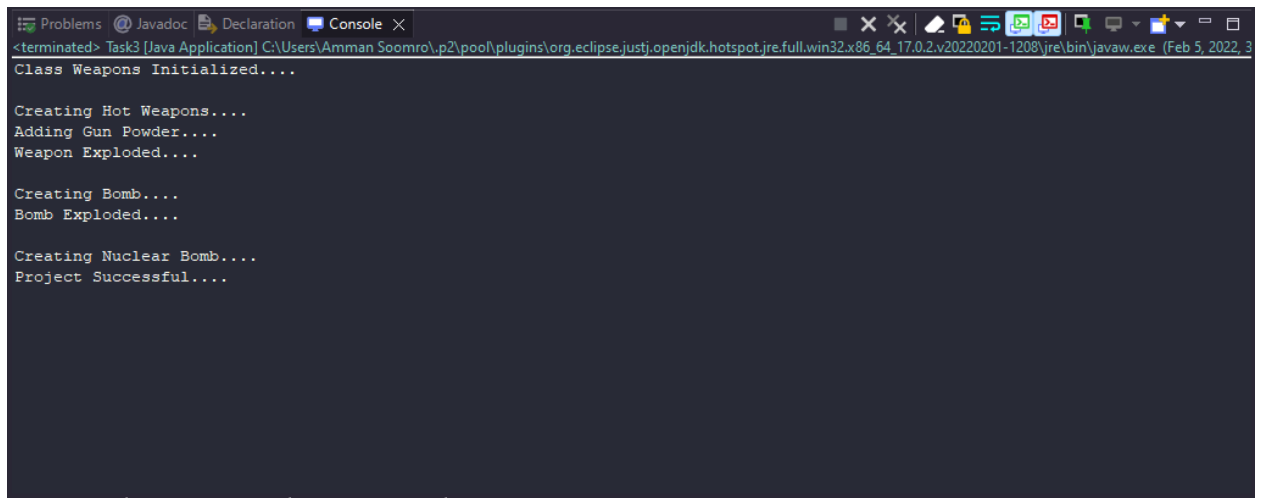
class Weapons{
    public void WeaponsDescription()
    {
        System.out.println("Class Weapons Initialized....");
        System.out.println(" ");
    }
}

class Hot_Weapons extends Weapons{
    public void Hot_WeaponsDescription() {
        System.out.println("Creating Hot Weapons....");
        System.out.println("Adding Gun Powder....");
        System.out.println("Weapon Exploded....");
        System.out.println(" ");
    }
}

class Bombs extends Hot_Weapons{
    public void BombsDescription()
    {
        System.out.println("Creating Bomb....");
        System.out.println("Bomb Exploded....");
        System.out.println(" ");
    }
}

class Nuclear_Bombs extends Bombs{
    public void Nuclear_BombsDescription()
    {
        System.out.println("Creating Nuclear Bomb....");
        System.out.println("Project Successful....");
        System.out.println(" ");
    }
}
```


OUTPUT



The screenshot shows the Eclipse IDE's console window. The title bar includes tabs for 'Problems', 'Javadoc', 'Declaration', and 'Console'. The console text is as follows:

```
<terminated> Task3 [Java Application] C:\Users\Amman Soomro\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_17.0.2.v20220201-1208\jre\bin\javaw.exe (Feb 5, 2022, 3:00:00 PM)  
Class Weapons Initialized....  
  
Creating Hot Weapons....  
Adding Gun Powder....  
Weapon Exploded....  
  
Creating Bomb....  
Bomb Exploded....  
  
Creating Nuclear Bomb....  
Project Successful....
```

QUESTION NO 04

CODE

```
public class Task4 {

    public static void main(String[] args) {

        Person PObj = new Person();
        PObj.setName("Amman");
        System.out.println("Name: " + PObj.getName());
        System.out.println("Occupation: " + PObj.getOccupation());
        PObj.Draw();
        System.out.println(" ");

        Artist AObj = new Artist();
        AObj.setName("Naba");
        System.out.println("Name: " + AObj.getName());
        System.out.println("Occupation: " + AObj.getOccupation());
        AObj.Draw();
        System.out.println(" ");

        Gunman GObj = new Gunman();
        GObj.setName("Ahmed");
        System.out.println("Name: " + GObj.getName());
        System.out.println("Occupation: " + GObj.getOccupation());
        GObj.Draw();
    }
}

class Person {
    private String Name, Occupation;

    public String getName() {
        return Name;
    }

    public void setName(String name) {
        Name = name;
    }

    public String getOccupation() {
        return Occupation;
    }

    public void setOccupation(String occupation) {
```

```

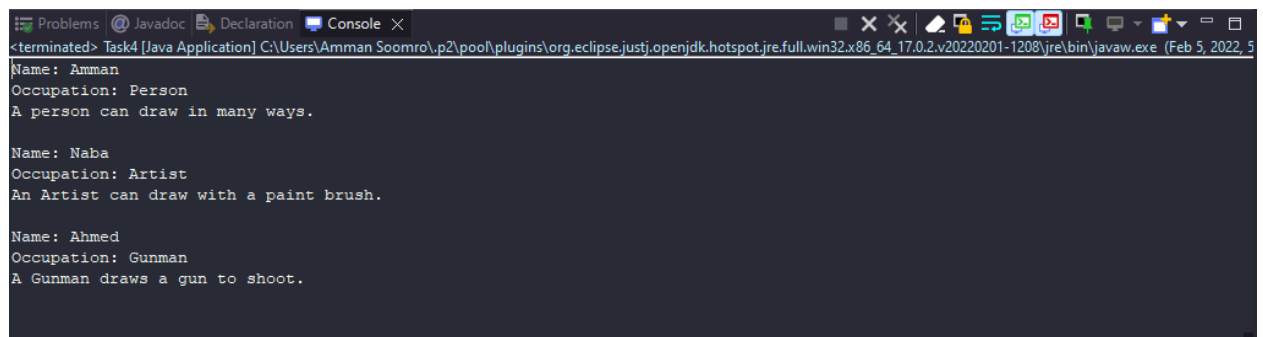
        Occupation = occupation;
    }
    Person()
    {
        setOccupation("Person");
    }
    public void Draw()
    {
        System.out.println("A person can draw in many ways.");
    }
}

class Artist extends Person{
    Artist()
    {
        setOccupation("Artist");
    }
    public void Draw()
    {
        System.out.println("An Artist can draw with a paint brush.");
    }
}

class Gunman extends Person {
    Gunman()
    {
        setOccupation("Gunman");
    }
    public void Draw()
    {
        System.out.println("A Gunman draws a gun to shoot.");
    }
}

```

OUTPUT



```

<terminated> Task4 [Java Application] C:\Users\Amman Soomro\.p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_17.0.2.v20220201-1208\jre\bin\javaw.exe (Feb 5, 2022, 5
Name: Amman
Occupation: Person
A person can draw in many ways.

Name: Naba
Occupation: Artist
An Artist can draw with a paint brush.

Name: Ahmed
Occupation: Gunman
A Gunman draws a gun to shoot.

```