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AIM:	To learn about the concept of inheritance.
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Program 1

PROBLEM STATEMENT:	<p>Define parent class "Employee" that has 3 private attributes String name, String id, int age. Employee has constructor with 3 arguments that set value of name, id, age. It also has getter and setter methods for all 3 private attributes.</p> <p>Class "SalariedEmployee" is a sub class of Employee and has 1 private attribute empSalary. "SalariedEmployee" can be permanent or on contract and has constructor SalariedEmployee (String name, String id, int age, double empSalary) to set the values.</p> <p>constructor SalariedEmployee must call the superclass constructor to set name, id, age and call setter method to set the salary.</p> <p>Employee salary is empSalary + 2000(allowance) if he is a permanent employee else Employee salary is empSalary (no allowance).</p> <p>Accept the details of 5 employees and print details of the employee with highest salary.</p> <p>Create class Tester with main method</p>
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PROGRAM:	<pre>import java.util.*; class Employee { private int age; private String name,id; Employee(String name,String id,int age) { this.name = name; this.id = id; this.age = age; } //getters int getage(){return age;} String getid(){return id;} String getname(){return name;} //setters void setid(String id){this.id = id;} void setname(String name){this.name = name;} void setage(int age){this.age = age;} }</pre>
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```

class SalariedEmployee extends Employee {
    private double salary;
    SalariedEmployee(String name,String id,int age,double empSalary) {
        super(name,id,age);
        setSalary(empSalary);
    }
    //setters & getters
    void setSalary(double salary){this.salary = salary;}
    double getSalary(){return salary;}
    void sortsal(int n,SalariedEmployee [] employees) {
        double max = 0;
        int c=0;
        for(int i=0;i<n;i++) {
            if(employees[i].getSalary()>max) {
                max = employees[i].getSalary();
                c = i;
            }
        }
        System.out.println("\nDetails of Highest-Paid Employee:\nEmployee ID\tName\tAge\tSalary");

        System.out.printf("%s\t%s\t%d\t%.2f",employees[c].getid(),employees[c].getname(),employees[c].getage(),employees[c].getSalary());
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String name,id;
        int age,e;
        double salary;
        System.out.print("No. of Employees: ");
        int n = sc.nextInt();
        SalariedEmployee [] employees = new SalariedEmployee[n];
        for(int i=0;i<n;i++) {
            System.out.printf("\nEmployee %d:\n",i+1);
            System.out.print("Enter name: ");
            name = sc.next();
            System.out.print("Enter ID: ");
            id = sc.next();
            System.out.print("Enter Age: ");
            age = sc.nextInt();
            System.out.print("Enter Salary: ");
            salary = sc.nextDouble();
            System.out.print("1 -> Permanent Employee\n2 -> Contracted Employee\n");
        }
    }
}

```

```
        e = sc.nextInt();
        if(e==1) {
            salary += 2000;
        }
        employees[i] = new SalariedEmployee(name,id,age,salary);
    }
    employees[0].sortsal(n,employees);
    sc.close();
}
}
```

RESULT:

```
Enter the details of 5 employees:
Enter the name of the Employee 1:  Hatim
Enter the ID of the Employee: 45
Enter the age of the Employee: 23
Enter the salary of the Employee: 6000
Enter the type of the Employee: Permanent

Enter the name of the Employee 2:  Dev
Enter the ID of the Employee: 34
Enter the age of the Employee: 23
Enter the salary of the Employee: 69000
Enter the type of the Employee: Permanent

Enter the name of the Employee 3:  Tathagat
Enter the ID of the Employee: 67
Enter the age of the Employee: 22
Enter the salary of the Employee: 69690
Enter the type of the Employee: Permanent

Enter the name of the Employee 4:  Dinesh
Enter the ID of the Employee: 54
Enter the age of the Employee: 26
Enter the salary of the Employee: 50000
Enter the type of the Employee: Contract

Enter the name of the Employee 5:  Akash
Enter the ID of the Employee: 57
Enter the age of the Employee: 29
Enter the salary of the Employee: 45000
Enter the type of the Employee: Contract
```

Details of Employee with the highest salary is:

Employee name: Tathagat

ID: 67

Age: 22

Salary: 71690.0

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Program 2

PROBLEM STATEMENT:

Mr. Abhishek Bachan is an H.R. Manager of “ABCL Technologies” At the beginning of the new year he and his company will need 30 new additional persons to fill up different vacancies in software team. He

gave an advertisement in the newspaper inviting applications for filling up different vacant posts.

As many as 120 applications were received. The same were scrutinized and they were given four tests.

There are 4 sections and each section has 2 questions each.

Create class Testing that generates the marks based on his answers in test.

class Testing has methods takeTest. Design objective answers for following questions and conduct test and generate result whether candidate passed or failed.

Create subclass Recruitment that prints if the person has passed(greater than 60%) or failed the test.

generateResult()

generates the marks percentage based on his answers in test.

Create class TesterAB with main method

The objective of the first test was to find out how much interest the applicant takes in his work.

Questions asked

1.What is the vision of the company?

2.How long will you stay in this role?

The objective of the second test was to find out ‘specialization’ of the applicant in any particular area.

Questions asked

1.What is final method in Java?

2.What is the latest version of Java?

Third test aimed at making sure whether the applicant was capable of learning through training or not.

Questions asked

1.What did you learn about Java in last job?

	<p>2.What do you wish to learn?</p> <p>The purpose of the fourth test was to find out how much capability a person has to mix-up with other persons, and whether he can influence other persons and get influenced by them.</p> <p>Questions asked</p> <p>1.What makes a team successful?</p> <p>2.Do you work faster in team or as individual?</p>
<p>PROGRAM:</p>	<pre> import java.util.*; class Testing{ int[] ansArr = {1,2,1,1,1,1,2,1}; int[][] appAns = new int[6][8]; int[] marksArr = new int[6]; void takeTest() { Scanner scan = new Scanner(System.in); for(int i=0;i<6;i++) { System.out.printf("For person %d\n", (i+1)); System.out.print("Section 1\n"); //1,2 System.out.print("What is the vision of the company\n"); System.out.print("1) to become UNICORN \n"); System.out.print("2) To create local opportunity \n"); appAns[i][0] = scan.nextInt(); System.out.print("\n"); System.out.print("How long will you stay in this role?\n"); System.out.print("1) Sir, I will stay in your company as long as I can. \n"); System.out.print("2) Uptil I don't get better job offers \n"); appAns[i][1]=scan.nextInt(); System.out.print("\n"); System.out.print("Section 2\n"); //1,1 System.out.print("1.What is final method in Java? \n"); System.out.print(" 1) To declare constants in java\n"); System.out.print(" 2) I don't know the ans Sir \n"); appAns[i][2]=scan.nextInt(); System.out.print("\n"); System.out.print("What is the latest version of Java?\n"); System.out.print(" 1) JAVA SE 18. \n"); System.out.print(" 2) JAVA SE 22. \n"); appAns[i][3]=scan.nextInt(); System.out.print("\n"); </pre>

```

System.out.print("Section 3\n");// 1,1
System.out.print("What did you learn about Java in last job?\n");
System.out.print(" 1) This is my first job Sir. \n");
System.out.print(" 2) Java is a general purpose programming language, much like Python or JavaScript..
appAns[i][4]=scan.nextInt();
System.out.print("\n");
System.out.print("What do you wish to learn?\n");
System.out.print(" 1) I am interested in the ways this job can help me grow personally and professionally.
System.out.print(" 2) I wish to explore more about technology\n");
appAns[i][5]=scan.nextInt();
System.out.print("\n");
System.out.print("Section 4\n"); //2,1
System.out.print("What makes a team successful?\n");
System.out.print(" 1) By helping the team in whatever way you can and putting team ahead of yourself\n
System.out.print(" 2) Having mutual respect, common and aligned goals, open communication, and patie
appAns[i][6]=scan.nextInt();
System.out.print("Do you work faster in team or as individual?\n");
System.out.print(" 1) As a Team\n");
System.out.print(" 2) As an Individual\n");
appAns[i][7]=scan.nextInt();
}

for(int j=0;j<6;j++)
{
int sum = 0;
for(int k=0;k<8;k++)
{
if(ansArr[k] == appAns[j][k])
{
sum += 1;
}
}
marksArr[j] = sum;
}
}
}

class Recruitment extends Testing{
int[] percentageArr = new int[6];
String passOrfail;
void generateResult()
{
for(int i=0;i<6;i++)
{

```

```

percentageArr[i] = (marksArr[i]/8)*100;
if (percentageArr[i] >= 60)
{
    passOrfail = "Passed";
}
else passOrfail = "Failed";
System.out.println("Person " + (i+1) + " has " + passOrfail + " the test");
}
}
}
public class TesterAB{

    public static void main(String[] args)
    {
        Recruitment ob = new Recruitment();
        ob.takeTest();
        ob.generateResult();
    }

}

```

RESULT:

```

For person 1
Section 1
What is the vision of the company
1) to become UNICORN
2) To create local opportunity
1

How long will you stay in this role?
1) Sir, I will stay in your company as long as I can.
2) Uptil I don't get better job offers
2

Section 2
1.What is final method in Java?
1) To declare constants in java
2) I don't know the ans Sir
1

What is the latest version of Java?
1) JAVA SE 18.
2) JAVA SE 22.
1

```

Section 3

What did you learn about Java in last job?

- 1) This is my first job Sir.
- 2) Java is a general purpose programming language, much like Python or JavaScript..

1

What do you wish to learn?

- 1) I am interested in the ways this job can help me grow personally and professionally.
- 2) I wish to explore more about technology

1

Section 4

What makes a team successful?

- 1) By helping the team in whatever way you can and putting team ahead of yourself
- 2) Having mutual respect, common and aligned goals, open communication, and patience

2

Do you work faster in team or as individual?

- 1) As a Team
- 2) As an Individual

1

For person 2

Section 1

What is the vision of the company

- 1) to become UNICORN
- 2) To create local opportunity

1

How long will you stay in this role?

- 1) Sir, I will stay in your company as long as I can.
- 2) Uptil I don't get better job offers

2

Section 2

1.What is final method in Java?

- 1) To declare constants in java
- 2) I don't know the ans Sir

1

What is the latest version of Java?

- 1) JAVA SE 18.
- 2) JAVA SE 22.

2

Section 3

What did you learn about Java in last job?

- 1) This is my first job Sir.
- 2) Java is a general purpose programming language, much like Python or JavaScript..

1

What do you wish to learn?

- 1) I am interested in the ways this job can help me grow personally and professionally.
- 2) I wish to explore more about technology

2

Section 4

What makes a team successful?

- 1) By helping the team in whatever way you can and putting team ahead of yourself
- 2) Having mutual respect, common and aligned goals, open communication, and patience

1

Do you work faster in team or as individual?

- 1) As a Team
- 2) As an Individual

2) As an individual

2

For person 3

Section 1

What is the vision of the company

1) to become UNICORN

2) To create local opportunity

1

How long will you stay in this role?

1) Sir, I will stay in your company as long as I can.

2) Uptil I don't get better job offers

1

Section 2

1. What is final method in Java?

1) To declare constants in java

2) I don't know the ans Sir

1

What is the latest version of Java?

1) JAVA SE 18.

2) JAVA SE 22.

1

Section 3

What did you learn about Java in last job?

1) This is my first job Sir.

2) Java is a general purpose programming language, much like Python or JavaScript..

2

What do you wish to learn?

- 1) I am interested in the ways this job can help me grow personally and professionally.
- 2) I wish to explore more about technology

2

Section 4

What makes a team successful?

- 1) By helping the team in whatever way you can and putting team ahead of yourself
- 2) Having mutual respect, common and aligned goals, open communication, and patience

2

Do you work faster in team or as individual?

- 1) As a Team
- 2) As an Individual

2

For person 4

Section 1

What is the vision of the company

- 1) to become UNICORN
- 2) To create local opportunity

1

How long will you stay in this role?

- 1) Sir, I will stay in your company as long as I can.
- 2) Uptil I don't get better job offers

1

Section 2

1.What is final method in Java?

- 1) To declare constants in java
- 2) I don't know the ans Sir

1

What is the latest version of Java?

- 1) JAVA SE 18.
- 2) JAVA SE 22.

1

Section 3

What did you learn about Java in last job?

- 1) This is my first job Sir.
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What do you wish to learn?

- 1) I am interested in the ways this job can help me grow personally and professionally.
- 2) I wish to explore more about technology

1

Section 4

What makes a team successful?

- 1) By helping the team in whatever way you can and putting team ahead of yourself
- 2) Having mutual respect, common and aligned goals, open communication, and patience

1

Do you work faster in team or as individual?

- 1) As a Team
- 2) As an Individual

1

For person 5

Section 1

What is the vision of the company

- 1) to become UNICORN
- 2) To create local opportunity

2

How long will you stay in this role?

- 1) Sir, I will stay in your company as long as I can.
- 2) Uptil I don't get better job offers

2

Section 2

1.What is final method in Java?

- 1) To declare constants in java
- 2) I don't know the ans Sir

2

What is the latest version of Java?

- 1) JAVA SE 18.
- 2) JAVA SE 22.

2

Section 3

What did you learn about Java in last job?

- 1) This is my first job Sir.
- 2) Java is a general purpose programming language, much like Python or JavaScript..

2

What do you wish to learn?

- 1) I am interested in the ways this job can help me grow personally and professionally.
- 2) I wish to explore more about technology

2

Section 4

What makes a team successful?

- 1) By helping the team in whatever way you can and putting team ahead of yourself
- 2) Having mutual respect, common and aligned goals, open communication, and patience

2

Do you work faster in team or as individual?

- 1) As a Team
- 2) As an Individual

2

For person 6

Section 1

What is the vision of the company

- 1) to become UNICORN
- 2) To create local opportunity

1

How long will you stay in this role?

- 1) Sir, I will stay in your company as long as I can.
- 2) Uptil I don't get better job offers

1

Section 2

1.What is final method in Java?

- 1) To declare constants in java
- 2) I don't know the ans Sir

1

What is the latest version of Java?

- 1) JAVA SE 18.
- 2) JAVA SE 22.

1

```
Section 3
What did you learn about Java in last job?
1) This is my first job Sir.
2) Java is a general purpose programming language, much like Python or JavaScript..
2

What do you wish to learn?
1) I am interested in the ways this job can help me grow personally and professionally.
2) I wish to explore more about technology
2

Section 4
What makes a team successful?
1) By helping the team in whatever way you can and putting team ahead of yourself
2) Having mutual respect, common and aligned goals, open communication, and patience
2
Do you work faster in team or as individual?
1) As a Team
2) As an Individual
2
Person 1 has Passed the test
Person 2 has Failed the test
Person 3 has Failed the test
Person 4 has Failed the test
Person 5 has Failed the test
Person 6 has Failed the test
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```

Program 3

PROBLEM STATEMENT:

The cost of stock on each day is given in an array $A[]$ of size N .
Day 1 price in first location, day 2 price in second location etc. Find all the days on which you buy and sell the stock any number of time so that in between those days your profit is maximum. A new transaction can only start after previous transaction is complete. Person can hold only one share at a time.

Create class Stock that has name of stock and array of prices. Also it has input method that initialises the predicted price of the stock in an array of length N .

Create class Transaction that is sub class of Stock class. It has method findMaximumProfit method.

Example

Stock Prices: {1, 5, 2, 3, 7, 6, 4, 5}

Total profit earned is 10

Buy on day 1 and sell on day 2

Buy on day 3 and sell on day 5

Buy on day 7 and sell on day 8

PROGRAM:	<pre>import java.util.Scanner; class Details { String name; int stock_prices []; public void input() { Scanner a = new Scanner(System.in); for (int i = 0; i < stock_prices.length; ++i) { System.out.print("Enter Day " + (i + 1) + " Price: "); stock_prices[i] = a.nextInt(); } } } class Transaction extends Details { public Transaction(int N) { stock_prices = new int[N]; input(); } public void MaxProfit() { int profit = 0; int local_min = 0; int local_max = 0; for (int i = 1; i < stock_prices.length - 1; ++i) { if (stock_prices[i - 1] > stock_prices[i]) { local_min = i; } if (stock_prices[i - 1] < stock_prices[i] && stock_prices[i] > stock_prices[i + 1]) { local_max = i; profit += stock_prices[local_max] - stock_prices[local_min]; System.out.println("Buy On Day " + (local_min + 1) + ", Sell On Day " + (local_max + 1)); } } } }</pre>
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```

    }
    if (i == stock_prices.length - 2)
    {
        if (stock_prices[stock_prices.length - 1] > stock_prices[local_min])
        {
            System.out.println("Buy On Day " + (local_min + 1) + ", Sell On Day " + (stock_prices.length - 1));
            profit += stock_prices[stock_prices.length - 1] - stock_prices[local_min];
        }
    }
}
System.out.println("Profit: " + profit);
}
}

public class stock
{
    public static void main(String [] args)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter Number Of Days: ");
        int temp_number = sc.nextInt();
        Transaction s1 = new Transaction(temp_number);
        s1.MaxProfit();
    }
}

```

```

Enter Number Of Days: 8
Enter Day 1 Price: 1
Enter Day 2 Price: 5
Enter Day 3 Price: 2
Enter Day 4 Price: 3
Enter Day 5 Price: 7
Enter Day 6 Price: 6
Enter Day 7 Price: 4
Enter Day 8 Price: 5
Buy On Day 1, Sell On Day 2
Buy On Day 3, Sell On Day 5
Buy On Day 7, Sell On Day 8
Profit: 10

```

RESULT:

CONCLUSION:

We learned how Inheritance helps us create classes based on existing classes, which increases the reusability of the code. We also learned about private access modifiers.