JOBSHEET 7

INHERITANCE

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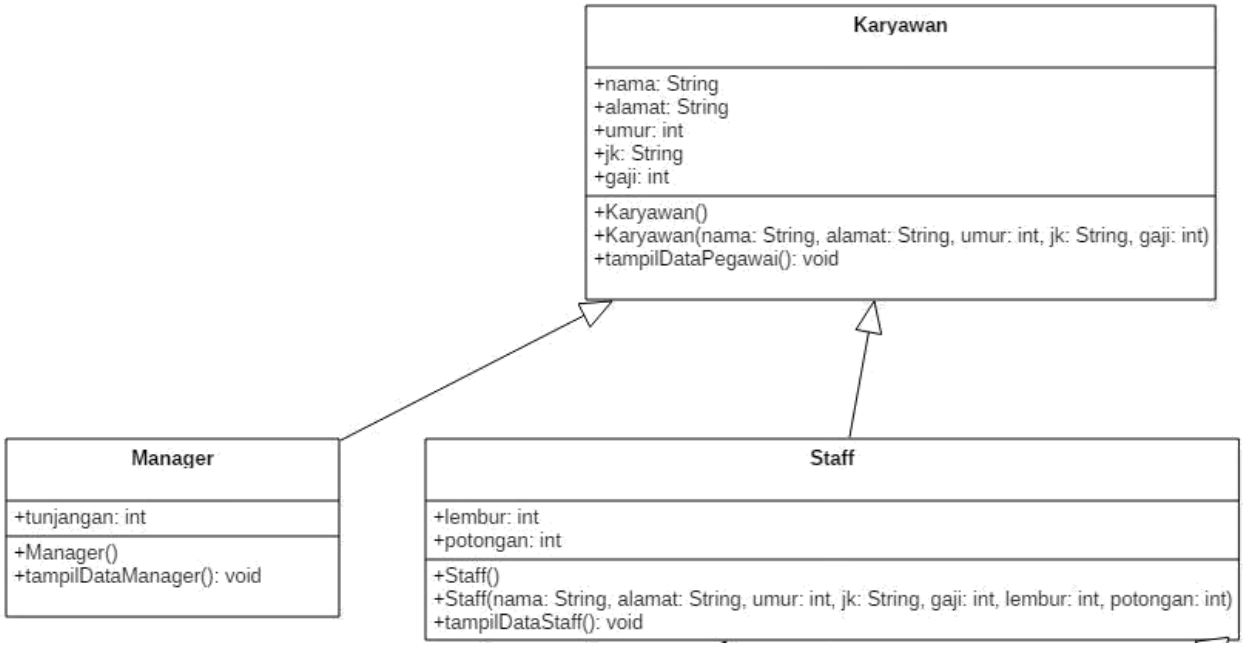
3. TRIAL 1 (extends)

A. STEP BY STEP

Look at the class diagram below:



1. Create a Karyawan class.

```
public class Karyawan {
    public String nama, alamat, jk;
    public int umur, gaji;

    public Karyawan(){

    }
    public Karyawan(String nama, String alamat, String jk, int umur, int gaji){
        this.nama=nama;
        this.alamat=alamat;
        this.jk=jk;
        this.umur=umur;
        this.gaji=gaji;
    }
    public void tampilDataKaryawan(){
        System.out.println("Nama            =" +nama);
        System.out.println("Alamat          =" +alamat);
        System.out.println("Jenis Kelamin   =" +jk);
        System.out.println("Umur            =" +umur);
        System.out.println("Gaji            =" +gaji);
    }
}
```

2. Create a Manager class

```
10      * @author WINDOWS 10
11      */
12     public class Manager extends Karyawan{
13         public int tunjangan;
14
15         public Manager(){
16
17         }
18         public void tampilDataManager(){
19             super.tampilDataKaryawan();
20             System.out.println("Tunjangan        ="+tunjangan);
21             System.out.println("Total Gaji       ="+(super.gaji+tunjangan));
22         }
23
24     }
25
26
```

3. Create a Staff class

```
10      * @author WINDOWS 10
11      */
12     public class Staff extends Karyawan {
13         public int lembur, potongan;
14
15         public Staff(){
16
17         }
18         public Staff(String nama, String alamat, String jk, int umur, int gaji, int lembur, int potongan){
19             super(nama,alamat,jk,umur,gaji);
20             this.lembur=lembur;
21             this.potongan=potongan;
22         }
23         public void tampilDataStaff(){
24             super.tampilDataKaryawan();
25             System.out.println("Lembur           ="+lembur);
26             System.out.println("Potongan         ="+potongan);
27             System.out.println("Total Gaji       ="+(gaji+lembur-potongan));
28         }
29     }
30
```

4. Create a inheritance1 class

```
12  public class Inheritance1 {
13
14      /**
15       * @param args the command line arguments
16       */
17      public static void main(String[] args) {
18          // TODO code application logic here
19          Manager M = new Manager();
20          M.nama="Vivin";
21          M.alamat="Jl. Vinolia";
22          M.umur=25;
23          M.jk="Perempuan";
24          M.gaji=3000000;
25          M.tunjangan=1000000;
26          M.tampilDataManager();
27
28          Staff S = new Staff();
29          S.nama="Lestari";
30          S.alamat="Malang";
31          S.umur=25;
32          S.jk="Perempuan";
33          S.gaji=2000000;
34          S.lembur=500000;
35          S.potongan=250000;
36          S.tampilDataStaff();
37      }
38
39  }
40
```

5. Run the program, then the appearance is as follows:

```
Output - inheritance1 (run)
run:
Nama            =Vivin
Alamat          =Jl. Vinolia
Jenis Kelamin   =Perempuan
Umur            =25
Gaji            =3000000
Tunjangan       =1000000
Total Gaji      =4000000
Nama            =Lestari
Alamat          =Malang
Jenis Kelamin   =Perempuan
Umur            =25
Gaji            =2000000
Lembur          =500000
Potongan        =250000
Total Gaji      =2250000
BUILD SUCCESSFUL (total time: 0 seconds)
```

B. QUESTIONS

1. Mention which class belongs to the super class and sub class from experiment 1 above!

Jawaban : Yang termasuk ke dalam super class adalah class Karyawan. Sedangkan sub classnya adalah class Manajer dan Staff.

2. What keywords are used to pass a class to another class?

Jawaban : Untuk menurukan suatu class ke class yang lain kata kuncinya adalah extends.

3. Pay attention to the program code in the class manager, what attributes does the class have? State which attributes are inherited from the Employee class!

Jawaban : Atribut yang diwariskan adalah nama, alamat, jk, umur dan gaji.

4. Explain the super keywords in the program snippet below found in the class Manager!

```
System.out.println("Total Gaji       ="+(super.gaji+tunjangan));
```

Jawaban : Kata kunci super digunakan untuk merujuk pada super class nya yaitu class Karyawan dan mentarget ke arah atribut gaji. Jadi, intinya adalah untuk mengakses atribut gaji pada class Karyawan.

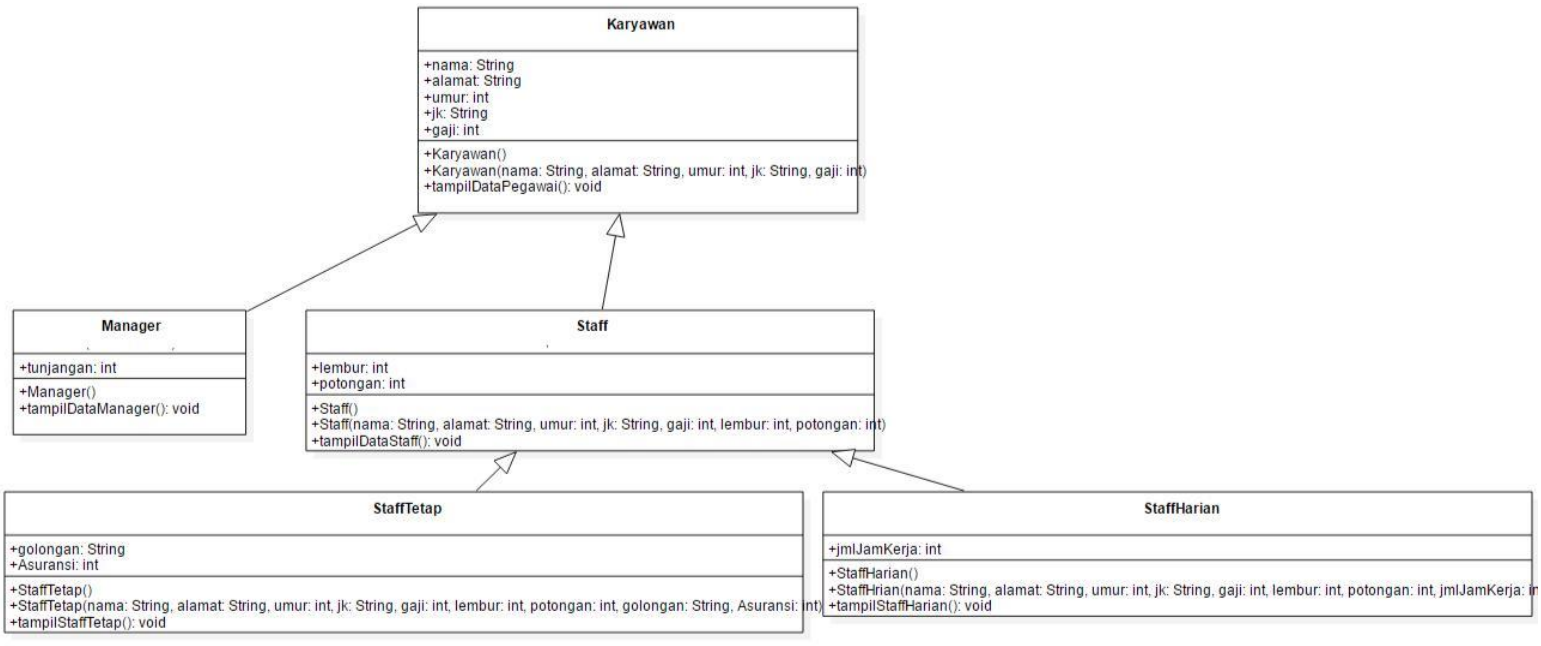
5. The program in Experiment 1 above is included in what type of inheritance? Explain the reason!

Jawaban : Pada percobaan 1 termasuk ke dalam jenis inheritance Hierarcichal Inheritance. Dikarenakan pada jenis inheritance tersebut terjadi ketika sebuah class memiliki lebih dari satu kelas turunan (subclass). Sesuai dengan yang terjadi pada percobaan 1.

4. TRIAL 2

A. STEP BY STEP

1. Pay attention to the class diagram below



2. Based on the program that you have made in the previous experiment 1, add two classes, namely the Staff Staff class and the Staff Day class. The program code is as follows

Class StaffTetap.java

```
11  */
12  public class StaffTetap extends Staff{
13      public String golongan;
14      public int asuransi;
15
16      public StaffTetap(){
17
18      }
19      public StaffTetap(String nama, String alamat, String jk, int umur,
20              int gaji, int lembur, int potongan,String golongan, int asuransi){
21          super(nama,alamat,jk,umur,gaji, potongan, lembur);
22          this.golongan=golongan;
23          this.asuransi=asuransi;
24      }
25      public void tampilStaffTetap(){
26          System.out.println("==============Data Staff Tetap====================");
27          super.tampilDataStaff();
28          System.out.println("Golongan         ="+golongan);
29          System.out.println("Jumlah Asuransi  ="+asuransi);
30          System.out.println("Gaji Bersih      ="+(gaji+lembur-potongan-asuransi));
31      }
32
33  }
```

Class StaffHarian.java

```
11  */
12  public class StaffHarian extends Staff{
13      public int jmlJamKerja;
14
15      public StaffHarian(){
16
17      }
18      public StaffHarian(String nama, String alamat, String jk, int umur,
19              int gaji, int lembur, int potongan,int jmlJamKerja){
20          super(nama,alamat,jk,umur,gaji,lembur,potongan);
21          this.jmlJamKerja=jmlJamKerja;
22      }
23      public void tampilStaffHarian(){
24          System.out.println("====================Data Staff Harian==================");
25          super.tampilDataStaff();
26          System.out.println("Jumlah Jam Kerja  ="+jmlJamKerja);
27          System.out.println("Gaji Bersih      ="+(gaji*jmlJamKerja+lembur-potongan));
28      }
29
30  }
```

3. After creating the two classes above then edit the inheritance1.java class to be as follows:

```
 */
public class Inheritance1 {

    /**
     * @param args the command line arguments
     */
    public static void main(String[] args) {
        // TODO code application logic here
        StaffTetap ST= new StaffTetap("Budi", "Malang", "Lakilaki", 20, 2000000, 250000, 200000, "2A", 100000);
        ST.tampilStaffTetap();


        StaffHarian SH = new StaffHarian("Indah", "Malang", "Perempuan", 27, 10000, 100000, 50000, 100);
        SH.tampilStaffHarian();
    }

}
```

4. Run the program then the display is as follows:

```
Output - inheritance1 (run)
run:
==============Data Staff Tetap====================
Nama             =Budi
Alamat           =Malang
Jenis Kelamin    =Lakilaki
Umur             =20
Gaji             =2000000
Lembur           =200000
Potongan         =250000
Total Gaji       =1950000
Golongan         =2A
Jumlah Asuransi =100000
Gaji Bersih      =1850000
====================Data Staff Harian==================
Nama             =Indah
Alamat           =Malang
Jenis Kelamin    =Perempuan
Umur             =27
Gaji             =10000
Lembur           =100000
Potongan         =50000
Total Gaji       =60000
Jumlah Jam Kerja =100
Gaji Bersih      =1050000
BUILD SUCCESSFUL (total time: 0 seconds)
```

B. QUESTIONS

1. Based on the class above, which one belongs to single inheritance and which one belongs to multilevel inheritance?

Jawaban : Untuk yang termasuk ke dalam single inheritance adalah antara class Karyawan dan class Manager.

Lalu, untuk yang termasuk ke dalam multilevel inheritance adalah class Karyawan - class Staff dan class StaffTetap & class StaffHarian.

2. Pay attention to the program code StaffTable and StaffHarian, what attributes do those classes have? State which attributes are inherited from the Staff class!

Jawaban : Atribut yang diwarisi dari class Staff adalah lembur dan potongan. Namun, karena class Staff adalah subclass dari class Karyawan. Maka, atribut dari class Karyawan terwariskan hingga ke class StaffTetap dan class StaffHarian secara tidak langsung.

3. Does the following program snippet function in the StaffHarian class

```
super(nama,alamat,jk,umur,gaji,lembur,potongan);
```

Jawaban : Untuk merujuk pada class super atau parentnya yang dimana nantinya akan mengakses atribut yang ada didalam parameternya.

4. Does the following program snippet function in the StaffHarian class

```
super.tampilDataStaff();
```

Jawaban : Untuk mengakses method tampilDataStaff() pada class super nya yaitu pada class Staff.

5. Pay attention to the program code below contained in the Staff Staff class

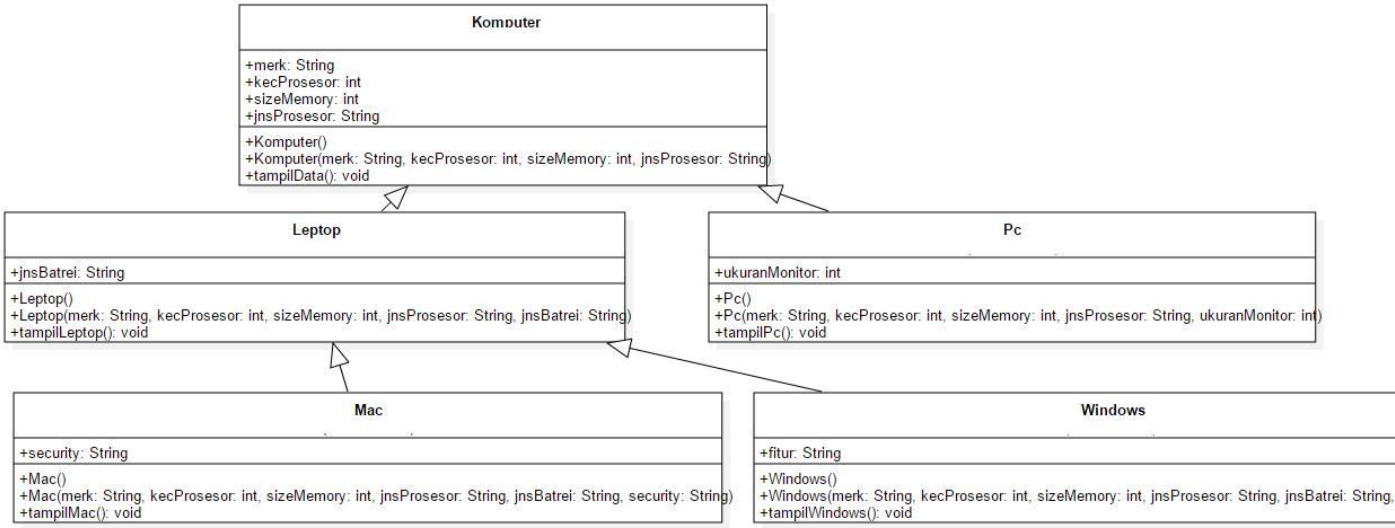
```
System.out.println("Gaji Bersih      ="+(gaji+lembur-potongan-asuransi));
```

Seen program deductions above the salary, overtime and deduction attributes can be accessed directly. Why did this happen and how did the Staff Staff class have the attributes of salary, overtime, and deduction even though the class attribute did not declare salary, overtime, and deduction?

Jawaban : Potongan kode berikut masih bisa diakses dikarenakan terjadi pewarisan kepada class StaffTetap dari class Staff pada atribut lembur dan potongan. Lalu, pada atribut gaji diwariskan secara tidak langsung dari class Karyawan.

10. ASSIGNMENTS

1. Make a program with the concept of inheritance as in the following class diagram. Then create an object instance to display data on Mac, Windows and Pc classes.



Jawaban :

Class Pc.java

```java
package Tugas;

public class Pc extends Komputer {
    public int ukuranMonitor;

    public Pc() {

    }

    public Pc(String merk, String jnsProsesor, int kecProsesor, int sizeMemory, int ukuranMonitor) {
        super(merk, jnsProsesor, sizeMemory, kecProsesor);
        this.ukuranMonitor = ukuranMonitor;
    }

    public void tampilPc() {
        super.tampilData();
        System.out.println("Ukuran Monitor          = " + ukuranMonitor);
    }
}

```

Class Windows.java

```java
package Tugas;

public class Windows extends Laptop {
    public String fitur;

    public Windows() {

    }

    public Windows(String merk, String jnsProsesor, int kecProsesor, int sizeMemory, String jnsBatrei, String fitur) {
        super(merk, jnsProsesor, kecProsesor, sizeMemory, jnsBatrei);
        this.fitur = fitur;
    }

    public void tampilWindows() {
        super.tampilLaptop();
        System.out.println("Fitur                   = " + fitur);
    }
}
```

Class Mac.java

```java
package Tugas;

public class Mac extends Laptop {
    public String security;

    public Mac() {

    }

    public Mac(String merk, String jnsProsesor, int kecProsesor, int sizeMemory, String jnsBatrei, String security) {
        super(merk, jnsProsesor, kecProsesor, sizeMemory, jnsBatrei);
        this.security = security;
    }

    public void tampilMac() {
        super.tampilLaptop();
        System.out.println("Security                = " + security);

    }
}

```

Class Laptop.java

```java
package Tugas;

public class Laptop extends Komputer {
    public String jnsBatrei;

    public Laptop() {

    }

    public Laptop(String merk, String jnsProsesor, int kecProsesor, int sizeMemory, String jnsBatrei) {
        super(merk, jnsProsesor, sizeMemory, kecProsesor);
        this.jnsBatrei = jnsBatrei;
    }

    public void tampilLaptop() {
        super.tampilData();
        System.out.println("Jenis Baterai          = " + jnsBatrei);
    }
}
```

Class Komputer.java

```java
package Tugas;

public class Komputer {
    public String merk, jnsProsesor;
    public int kecProsesor, sizeMemory;

    public Komputer() {

    }

    public Komputer(String merk, String jnsProsesor, int sizeMemory, int kecProsesor) {
        this.merk = merk;
        this.jnsProsesor = jnsProsesor;
        this.sizeMemory = sizeMemory;
        this.kecProsesor = kecProsesor;
    }

    public void tampilData() {
        System.out.println("==============Spesifikasi==============");
        System.out.println("Merk                   = " + merk);
        System.out.println("Jenis Prosesor         = " + jnsProsesor);
        System.out.println("Kecepatan Prosesor     = " + kecProsesor);
        System.out.println("Size Memory            = " + sizeMemory);
    }
}

```

Class Main.java

```java
package Tugas;

import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        while (true) {
            System.out.println("***********************");
            System.out.println("List Laptop dan Komputer");
            System.out.println("***********************");
            System.out.println("1. PC");
            System.out.println("2. Macbook");
            System.out.println("3. Windows");
            System.out.println("4. Exit");
            System.out.print("Masukkan Pilihan kamu: ");
            int choice = sc.nextInt();

            switch (choice) {
                case 1:
                    System.out.print("\nMasukkan Merk               : ");
                    String merkPC = sc.next();
                    System.out.print("Masukkan Kecepatan Prosesor : ");
                    int kecepatanProsesorPC = sc.nextInt();
                    System.out.print("Masukkan Jenis Prosesor     : ");
                    String jenisProsesorPC = sc.next();
                    System.out.print("Masukkan Size Memory        : ");
                    int sizeMemoryPC = sc.nextInt();
                    System.out.print("Masukkan Ukuran Layar       : ");
                    int ukuranLayarPC = sc.nextInt();
                    Pc pc = new Pc(merkPC, jenisProsesorPC, kecepatanProsesorPC, sizeMemoryPC, ukuranLayarPC);
                    System.out.println("\nInformasi PC yang Anda Pilih:");
                    pc.tampilPc();
                    break;
                case 2:
                    System.out.print("\nMasukkan Merk               : ");
                    String merkMac = sc.next();
                    System.out.print("Masukkan Kecepatan Prosesor : ");
                    int kecepatanProsesorMac = sc.nextInt();
                    System.out.print("Masukkan Jenis Prosesor     : ");
                    String jenisProsesorMac = sc.next();
                    System.out.print("Masukkan Size Memory        : ");
                    int sizeMemoryMac = sc.nextInt();
                    System.out.print("Masukkan Jenis Baterai      : ");
                    String jenisBateraiMac = sc.next();
                    System.out.print("Masukkan Security           : ");
                    String securityMac = sc.next();
                    Mac mac = new Mac(merkMac, jenisProsesorMac, kecepatanProsesorMac, sizeMemoryMac, jenisBateraiMac,
                            securityMac);
                    System.out.println("\nInformasi Macbook yang Anda Pilih:");
                    mac.tampilMac();
                    break;
                case 3:
                    System.out.print("\nMasukkan Merk               : ");
                    String merkWindows = sc.next();
                    System.out.print("Masukkan Kecepatan Prosesor : ");
                    int kecepatanProsesorWindows = sc.nextInt();
                    System.out.print("Masukkan Jenis Prosesor     : ");
                    String jenisProsesorWindows = sc.next();
                    System.out.print("Masukkan Size Memory        : ");
                    int sizeMemoryWindows = sc.nextInt();
                    System.out.print("Masukkan Jenis Baterai      : ");
                    String jenisBateraiWindows = sc.next();
                    System.out.print("Masukkan fitur              : ");
                    String fiturWindows = sc.next();
                    Windows windows = new Windows(merkWindows, jenisProsesorWindows, kecepatanProsesorWindows,
                            sizeMemoryWindows, jenisBateraiWindows, fiturWindows);
                    System.out.println("\nInformasi Windows Laptop yang Anda Pilih:");
                    windows.tampilWindows();
                    break;
                case 4:
                    System.exit(0);
                default:
                    System.out.println("Pilihan tidak valid.");
            }
        }
    }
}

```