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Sec: A (A3)

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OOPs Practical 2

Aim: Create an Employee Attendance Management System (EMS).

A. Design a Class Time with data members as hours, minutes and seconds. This class provides the functionality to Add and Subtract two time objects. The result will be returned in a new time object.

B. Create a class to store Attendance. The attendance will have Time_IN , Time_OUT along with date information.

C. Create a class Employee with employee name, id, name, age, designation, salary, Attendance[].

a. Provide the functionality to count the number of hours worked in a month.

b. Display the number of working hours of an employee for a given date.

Write appropriate constructors and display function where required.

Code & Output:

time.java

```
public class time {
    int hrs,min,sec;

    time(int hrs,int min, int sec){
        this.hrs = hrs;
        this.min = min;
        this.sec = sec;
    }

    time addTime(time a, time b){
        time c = new time(0,0,0);

        c.hrs = a.hrs+b.hrs;

        int temp_min = a.min+b.min;
```

```
        if(temp_min >= 60){
            c.hrs += 1;
            temp_min -= 60;
        }

        c.min = temp_min;

        int temp_sec = a.sec+b.sec;
        if(temp_sec >= 60){
            c.min += 1;
            temp_sec -= 60;
        }

        c.sec = temp_sec;
        return c;
    }

    void display(time a){
        System.out.print(a.hrs + " hrs " + a.min + " min " + a.sec + " sec ");
    }

    time subTime(time a, time b){
        time max = new time(0,0,0);
        time mini = new time(0,0,0);
        time ans = new time(0,0,0);

        if(a.hrs < b.hrs){
            max = b;
            mini = a;
        }
        else{
            max = a;
            mini = b;
        }

        ans.hrs = max.hrs - mini.hrs;
        if(max.min >= mini.min){
            ans.min = max.min - mini.min;
        }
        else{
            ans.hrs--;
            ans.min = 60 - mini.min;
        }

        if(max.sec >= mini.sec){
            ans.sec = max.sec - mini.sec;
        }
        else{
```

```
            ans.min--;
            ans.sec = 60 - max.sec;
        }

        return ans;
    }
}
```

attend.java

```
public class attend {
    time time_in = new time(0,0,0);
    time time_out = new time(0,0,0);
    int date, month, year;

    attend(time time_in, time time_out, int date, int month, int year){
        this.time_in = time_in;
        this.time_out = time_out;
        this.date = date;
        this.month = month;
        this.year = year;
    }

    void display(){
        System.out.print("\nDate: " + date +" "+ month+" " + year);
        System.out.print("\nTime in: ");
        time_in.display(time_in);
        System.out.print("\nTime out: ");
        time_out.display(time_out);
    }
}
```

employee.java

```
public class employee {
    String name;
    int id;
    int age;
    String des;
    int sal;
    attend[] a = new attend[10];          // Max days is set to 10 for now.
    int days=0;
    private time t = new time(0,0, 0);

    employee(String name, int id, int age, String des, int sal){
        this.name = name;
```

```
        this.id = id;
        this.age = age;
        this.des = des;
        this.sal = sal;
    }

    void addAttend(int date, int month, int year, time tin, time tout){
        a[days] = new attend(tin, tout, date, month, year);
        days++;
    }

    void display(){
        System.out.println("\nName: "+name);
        System.out.println("ID: "+id);
        System.out.println("Age: "+age);
        System.out.println("Designation: "+des);
        System.out.println("Salary: "+sal);
    }

    time workingHourInMonth(int m){
        time hr = new time(0,0,0);
        for(int i=0;i<days;i++){
            if(a[i].month == m){
                time temp = t.subTime(a[i].time_in, a[i].time_out);
                hr = t.addTime(hr, temp);
            }
        }
        return hr;
    }

    int displayWorkingHoursOnDate(int date, int month, int year){
        for(int i=0;i<days;i++){
            if(date == a[i].date && month == a[i].month && year == a[i].year){
                time tt = t.subTime(a[i].time_in, a[i].time_out);
                System.out.println("\n\nWorking Hours On Date: "+date+"
"+month+" "+year);
                System.out.print("Working Time: ");
                tt.display(tt);
                return 1;
            }
        }
        return 0;
    }
}
```

main.java

```
public class main {
    public static void main(String[] args) {

        // Part A

        System.out.println("\n----------- Part A -----------");
        time t1 = new time(10,10,10);
        time t2 = new time(17,5,5);
        System.out.print("\nTime 1: ");
        t1.display(t1);
        System.out.print("\nTime 2: ");
        t2.display(t2);

        time s = new time(0,0,0);
        System.out.print("\n\nAddition of time: ");
        s = s.addTime(t1, t2);
        s.display(s);

        time s1 = new time(0,0,0);
        System.out.print("\nSubtraction of time: ");
        s1 = s1.subTime(t1, t2);
        s1.display(s1);

        // Part B

        System.out.println("\n\n----------- Part B -----------");
        attend a = new attend(t1, t2, 30, 12, 2003);
        a.display();

        // Part C

        System.out.println("\n\n----------- Part C -----------");
        employee[] ea = new employee[5];

        time timein = new time(10, 30, 13);
        time timeout = new time(17, 0, 24);
        ea[0] = new employee("Sahil", 56, 19, "SDE", 50000);
        ea[0].addAttend(1,1,23,timein,timeout);
        ea[0].addAttend(2,1,23,timein,timeout);
        ea[0].addAttend(3,1,23,timein,timeout);
        ea[0].addAttend(4,1,23,timein,timeout);
        ea[0].addAttend(5,1,23,timein,timeout);
        ea[0].display();
        time temp = ea[0].workingHourInMonth(1);
        System.out.print("\nWorking Hours in month 1: ");
        temp.display(temp);
        ea[0].displayWorkingHoursOnDate(2,1,23);
```

```
    }
}
```

Output:

```
PS C:\Users\LENOVO\OneDrive\Desktop\GitHub Main Folder\Sem 4\OOPs> cd "c:\Users\LENOVO\OneDrive\De
 main.java } ; if ($?) { java main }

---------- Part A ----------

Time 1: 10 hrs 10 min 10 sec
Time 2: 17 hrs 5 min 5 sec

Addition of time: 27 hrs 15 min 15 sec
Subtraction of time: 6 hrs 49 min 55 sec

---------- Part B ----------

Date: 30 12 2003
Time in: 10 hrs 10 min 10 sec
Time out: 17 hrs 5 min 5 sec

---------- Part C ----------

Name: Sahil
ID: 56
Age: 19
Designation: SDE
Salary: 50000

Working Hours in month 1: 32 hrs 30 min 55 sec

Working Hours On Date: 2 1 23
Working Time: 6 hrs 30 min 11 sec
PS C:\Users\LENOVO\OneDrive\Desktop\GitHub Main Folder\Sem 4\OOPs\2nd_Prac>
```