

PRACTICAL 2

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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

```
// package prac2;

public class Time {
    int h,m,s;
    Time(int hr,int ms,int sc){
        h = hr;
        m = ms;
        s = sc;
    }

    Time Add(Time A,Time B){

        int sec = A.s + B.s;
        int sec1 = sec%60;
        int min = A.m + B.m + (sec/60);
        int mins = min%60;
        int hs = A.h + B.h + (min/60);

        Time n = new Time(hs,mins,sec1);

        return n;
    }
}
```

```

Time Sub(Time A,Time B){
    int t1 = A.h*60*60 + A.m*60 + A.s;
    int t2 = B.h*60*60 + B.m*60 + B.s;
    int tot = t1-t2;
    if(tot > 0)
        tot += 0;
    else
        tot *= (-1);

    int mins = tot/60;
    int hrs = mins/60;

    Time n = new Time(hrs,mins%60,tot%60);

    return n;
}

void display(){
    System.out.println("Hours: "+h+" Mins: "+m+" Sec: "+s);
}
}

```

Attendance.java

```

// package prac2;

public class Attendance {
    int dt,mn,yr;
    Time t,t1;
    Attendance(int date,int month,int year,Time q,Time q2){
        dt = date;
        mn = month;
        yr = year;
        t = q;
        t1 = q2;
    }

    void Display(){
        System.out.println("-----");
        System.out.println("DATE : "+dt+" - "+mn+" - "+yr);
        System.out.print("TIME IN --> ");
        t.display();
        System.out.print("TIME OUT --> ");
        t1.display();
        System.out.println("-----");
    }
}

```

```

    }
    Time hoursworked(){
        Time q3 = t.Sub(t1, t);
        // System.out.println("Hours Worked : "+q3.h);
        return q3;
    }
}

```

Employee.java

```

// package prac2;

public class Employee {
    String nm,des;
    int id,age;
    Attendance[] a = new Attendance[3];

    Employee(String name,int id1,int age1,String Designation,Attendance[] a1){
        nm = name;
        id = id1;
        age = age1;
        des = Designation;
        a = a1;
    }

    void Display1(){
        System.out.println("-----!!!!-----");
        System.out.println("Name : "+nm);
        System.out.println("ID : "+id);
        System.out.println("Age : "+age);
        System.out.println("Designation : "+des);
        for(Attendance a2:a){
            a2.Display();
        }
        System.out.println("-----");
    }

    void workingHours(){
        Time t1= new Time(0,0,0);
        for(Attendance a2:a){
            Time t2 = a2.hoursworked();
            // t2.display();
            t1 = t2.Add(t1, t2);
            // System.out.println("---- ");
            // t1.display();
        }
        System.out.println("TOTAL HOURS WORKED : "+t1.h);
    }
}

```

```

void workingHours(int dt1,int dt2,int mn1,int mn2){
    Time t1= new Time(0,0,0);
    for(Attendance a2:a){
        if((a2.mn >= mn1)&&(a2.mn <= mn2)){
            if((a2.dt >= dt1 )&&(a2.dt <= dt2)){
                Time t2 = a2.hoursworked();
                t1 = t2.Add(t1, t2);
            }
        }
    }
    System.out.println("TOTAL HOURS WORKED : "+t1.h);
}

void workingHours(int mn1){
    workingHours(1, 30, mn1, mn1);
}
}

```

Main.java

```

// package prac2;

public class Main {
    public static void main(String[] args) {
        Time s1 = new Time(3,59,0);
        s1.display();
        Time s2 = new Time(1,58,1);
        Time s3 = new Time(10,0,1);

        s2.display();
        Time s = s1.Add(s1, s2);
        s.display();
        Time sa = s1.Sub(s1, s2);
        sa.display();

        Attendance[] a = new Attendance[8];
        a[1] = new Attendance(4, 2, 2023, s1,s2);
        a[0] = new Attendance(1, 2, 2023, s1,s2);
        a[2] = new Attendance(6, 2, 2023, s1,s3);
        a[3] = new Attendance(10, 2, 2023, s1,s3);
        a[4] = new Attendance(15, 2, 2023, s2,s3);
        a[5] = new Attendance(20, 2, 2023, s2,s3);
        a[6] = new Attendance(2, 3, 2023, s2,s3);
        a[7] = new Attendance(4, 3, 2023, s2,s3);
    }
}

```

```

        a[0].Display();

        Employee e1 = new Employee("Shreyash", 62, 20, "Student", a);
        e1.Display1();
        e1.workingHours();
// if not parameter passed it gives all hours worked in whole working span
        e1.workingHours(2);
// if only one parameter it takes as a month and gives working hours of month
        e1.workingHours(1, 15, 2, 2);
//4 parameters ==> date/month 1 and date/month2 it gives all working between
these two dates
    }
}

```

Output:

```

PS C:\Users\smitk\Desktop\JAVA prac\prac2> cd "c:\Users\smitk\Desktop\JAVA prac\prac2\" ; if ($?) { javac Main.java } ; if ($?) { java Main }
Hours: 3 Mins: 59 Sec: 0
Hours: 1 Mins: 58 Sec: 1
Hours: 5 Mins: 57 Sec: 1
Hours: 2 Mins: 0 Sec: 59
-----
DATE : 1 - 2 - 2023
TIME IN --> Hours: 3 Mins: 59 Sec: 0
TIME OUT --> Hours: 1 Mins: 58 Sec: 1
-----
!!!!-----
Name : Shreyash
ID : 62
Age : 20
Designation : Student
-----
DATE : 1 - 2 - 2023
TIME IN --> Hours: 3 Mins: 59 Sec: 0
TIME OUT --> Hours: 1 Mins: 58 Sec: 1
-----
DATE : 4 - 2 - 2023
TIME IN --> Hours: 3 Mins: 59 Sec: 0
TIME OUT --> Hours: 1 Mins: 58 Sec: 1
-----
DATE : 6 - 2 - 2023
TIME IN --> Hours: 3 Mins: 59 Sec: 0
TIME OUT --> Hours: 10 Mins: 0 Sec: 1
-----
DATE : 10 - 2 - 2023
TIME IN --> Hours: 3 Mins: 59 Sec: 0
TIME OUT --> Hours: 10 Mins: 0 Sec: 1
-----
DATE : 15 - 2 - 2023
TIME IN --> Hours: 1 Mins: 58 Sec: 1
TIME OUT --> Hours: 10 Mins: 0 Sec: 1
-----

```

```

-----
DATE : 15 - 2 - 2023
TIME IN --> Hours: 1 Mins: 58 Sec: 1
TIME OUT --> Hours: 10 Mins: 0 Sec: 1
-----

```

```

-----
DATE : 20 - 2 - 2023
TIME IN --> Hours: 1 Mins: 58 Sec: 1
TIME OUT --> Hours: 10 Mins: 0 Sec: 1
-----

```

```

-----
DATE : 2 - 3 - 2023
TIME IN --> Hours: 1 Mins: 58 Sec: 1
TIME OUT --> Hours: 10 Mins: 0 Sec: 1
-----

```

```

-----
DATE : 4 - 3 - 2023
TIME IN --> Hours: 1 Mins: 58 Sec: 1
TIME OUT --> Hours: 10 Mins: 0 Sec: 1
-----

```

```

-----
TOTAL HOURS WORKED : 48
TOTAL HOURS WORKED : 32
TOTAL HOURS WORKED : 24

```

```

PS C:\Users\smitk\Desktop\JAVA prac\prac2> 

```