***OOPS LAB - PRACTICAL 2***

***Name : Prathamesh Rajbhoj***

***Branch : CSE***

***Section : 4A***

***Roll No : 53***

**Aim**

An Employee Attendance Management

System (EMS) has to be designed. The system maintains following information

**Employee :** id, name, age, designation, salary,

Attendance [] – array to maintain day-wise attendance of an employee

**Attendance**

date

time in (in 24 hours format HH MM)

time out (in 24 hours format HH MM)

**AttendanceGenerator**

Class that implements all the functionalities mentioned below

WAP to implement following functionalities of EMS

1. Display month wise attendance of an employee

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

3. Count Number of working days for an employee

Assumptions:

1. Each month is of 10 days (for simplicity of input)

2. You may define any other classes, if required

3. Use a suitable datatype for date and time as per your choice

Review Questions:

1. Object array passed as an argument to a method is pass by value or pass by reference? Justify your answer.

2. How do we declare a 2D object Array? Explain with an example.

***AutoTimeGenerator.java***

public class AutoTimeGenerator {

// generates random time between 1-11 hr

static int generate\_entry\_hour() {

int ans = (int) (1 + (Math.random() \* 15));

return ans;

}

// generates random time between 1-59 min

static int generate\_entry\_min() {

int ans = (int) (1 + (Math.random() \* 58));

return ans;

}

// generates random time between 10-24 hr

static int generate\_exit\_hour() {

int ans = (int) (10 + (Math.random() \* 14));

return ans;

}

// generates random time between 1-59 min

static int generate\_exit\_min() {

int ans = (int) (1 + (Math.random() \* 58));

return ans;

}

}

***EMPLOYEE.JAVA***

public class Employee {

int id;

String name;

int age;

String designation;

double salary;

Attendance attd[][];

Employee() {

}

Employee(int id, String name, int age, String designation, double salary, Attendance attd[][]) {

this.id = id;

this.name = name;

this.age = age;

this.designation = designation;

this.salary = salary;

this.attd = attd;

}

void display() {

System.out.println();

System.out.println("ID : " + this.id);

System.out.println("Name : " + this.name);

System.out.println("Age : " + this.age);

System.out.println("Designation : " + this.designation);

System.out.println("Salary : " + this.salary);

for (int i = 0; i < 12; i++) {

for (int j = 0; j < 10; j++) {

attd[i][j].display\_attendance();

}

}

System.out.println();

}

void month\_wise\_display(int month\_no) {

if (month\_no > 12 || month\_no < 1) {

System.out.println("\n\nInvalid Month\n\n");

return;

}

System.out.println();

System.out.println("ID : " + this.id);

System.out.println("Name : " + this.name);

System.out.println("Age : " + this.age);

System.out.println("Designation : " + this.designation);

System.out.println("Salary : " + this.salary);

System.out.println();

for (int i = 0; i < 30; i++) {

attd[month\_no - 1][i].display\_attendance();

}

System.out.println();

}

int count\_time(int date, int month) {

int d = attd[month - 1][date - 1].duration;

return d;

}

int count\_working\_days() {

int ans = 0;

for (int i = 0; i < 12; i++) {

for (int j = 0; j < 30; j++) {

int d = attd[i ][j].duration;

if (d != 0) {

ans++;

}

}

}

return ans;

}

}

***Attendance.JAVA***

public class Attendance {

String date;

String time\_in;

String time\_out;

int duration;

// Time Format : 09:25

// Time Format : 18:07

Attendance() {

}

int find\_duration(String time\_in, String time\_out) {

int ans = 0;

if (time\_in == time\_out) {

return 0;

}

if (time\_in == "" || time\_out == "") {

return 0;

}

int hr1 = (time\_in.charAt(0)) \* 10 + (time\_in.charAt(1));

int min1 = (time\_in.charAt(3)) \* 10 + (time\_in.charAt(4));

int hr2 = (time\_out.charAt(0)) \* 10 + (time\_out.charAt(1));

int min2 = (time\_out.charAt(3)) \* 10 + (time\_out.charAt(4));

if (hr1 > hr2) {

return 0;

}

if (hr1 == hr2 && min1 > min2) {

return 0;

}

if (min1 < min2) {

ans += (hr2 - hr1) \* 60 + (min2 - min1);

} else {

ans += (hr2 - hr1 - 1) \* 60 + (60 - (min1 - min2));

}

// System.out.println(ans);

return ans;

}

Attendance(String date, String time\_in, String time\_out) {

this.date = date;

this.time\_in = time\_in;

this.time\_out = time\_out;

this.duration = find\_duration(this.time\_in, this.time\_out);

}

void display\_attendance() {

// System.out.println("Date : " + this.date);

// System.out.println("Entry : " + this.time\_in);

// System.out.println("Exit : " + this.time\_out);

// System.out.println("Duration : " + this.duration);

// System.out.println("duration : "+this.duration);

System.out.println(this.date + " - " + (this.duration / 60) + " hr " + (this.duration % 60) + " mins");

}

}

***AttendanceGenerator.JAVA***

import java.util.Scanner;

public class AttendanceGenerator {

public static void main(String[] args) {

// Assuming 30 days in a month for ease instead of 29,30,31

// 12 months in a year

Attendance a[][] = new Attendance[12][30];

Employee emp1 = new Employee(1, "Prathamesh Rajbhoj", 19, "CEO", 9999999, a);

System.out.println();

System.out.println();

System.out.println("Auto Generating Entrance and Exit Time Via Rand Function");

System.out.println();

System.out.println();

for (int i = 0; i < 12; i++) {

for (int j = 0; j < 30; j++) {

String date = Integer.toString(j + 1) + "/" + Integer.toString(i + 1);

int entry\_hr = AutoTimeGenerator.generate\_entry\_hour();

int entry\_min = AutoTimeGenerator.generate\_entry\_min();

int exit\_hr = AutoTimeGenerator.generate\_exit\_hour();

int exit\_min = AutoTimeGenerator.generate\_exit\_min();

// converting entry time into HH:MM Format

String entry = "";

if (entry\_hr < 10) {

entry += "0";

}

entry += Integer.toString(entry\_hr);

entry += ":";

if (entry\_min < 10) {

entry += "0";

}

entry += Integer.toString(entry\_min);

// converting exit time into HH:MM Format

String exit = "";

if (exit\_hr < 10) {

exit += "0";

}

exit += Integer.toString(exit\_hr);

exit += ":";

if (exit\_min < 10) {

exit += "0";

}

exit += Integer.toString(exit\_min);

a[i][j] = new Attendance(date, entry, exit);

// printing auto generated d time

System.out.println("Date : " + (j + 1) + "/" + (i + 1));

System.out.println("Entry Time : " + entry);

System.out.println("Exit Time : " + exit);

System.out.println("Duration : " + (a[i][j].duration / 60) + " hr " + (a[i][j].duration % 60) + " mins");

System.out.println();

}

}

Scanner sc = new Scanner(System.in);

System.out.println();

System.out.println();

System.out.print("Enter Month For which you want to see Attendance : ");

int month\_number = sc.nextInt();

System.out.println();

System.out.println();

emp1.month\_wise\_display(month\_number);

System.out.println();

System.out.println();

System.out.print("Enter Day For which you want to see Attendance : ");

String s = sc.next();

System.out.println();

int date = (s.charAt(0) - '0') \* 10 + (s.charAt(1) - '0');

int month = (s.charAt(3) - '0') \* 10 + (s.charAt(4) - '0');

int dur = emp1.count\_time(date, month);

System.out.println("Working Hour for " + (date) + "/" + (month) + " : " + (dur / 60) + " hr " + (dur % 60) + " mins");

System.out.println();

System.out.println();

System.out.println("Calculating Total Working Days for EMP1 in a year");

System.out.println();

int work\_day = emp1.count\_working\_days();

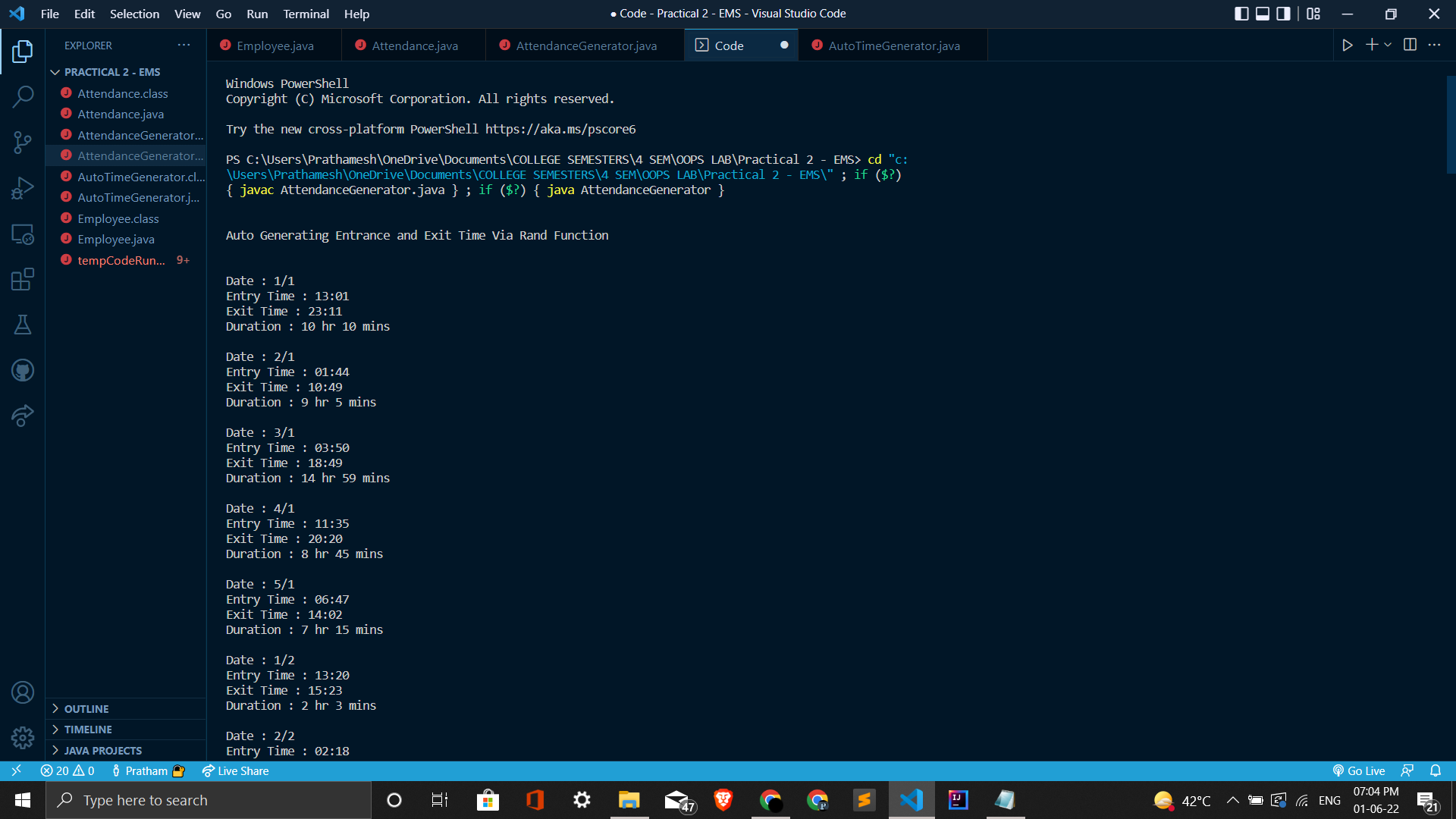
System.out.println("Total Working Days : " + work\_day + "/360\n");

sc.close();

}

}

***OUTPUTS***

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