**1.**

**package** Tuesday;

**interface** InstrumentApp {

**public** **void** play();

}

**public** **class** Instrument{

**public** **static** **void** main(String[] args) {

InstrumentApp Piano =()->{

System.***out***.println("piano is playing tan tan tan tan");

};

InstrumentApp flute =()->{

System.***out***.println("flute is playing toot toot toot toot");

};

InstrumentApp guitar =()->{

System.***out***.println("guitar is playing");

};

InstrumentApp [] instruments= **new** InstrumentApp[] {Piano,flute,guitar,Piano,flute,guitar,Piano,flute,guitar,Piano};

**for**(**int** i=0;i<instruments.length;i++) {

**if** (instruments[i] **instanceof** InstrumentApp) {

instruments[i].play();

}

}

}

}

**2.**

**package** Wednesday;

**import** java.time.LocalDate;

**import** java.time.LocalTime;

**import** java.time.ZoneId;

**import** java.time.ZonedDateTime;

**import** java.time.format.DateTimeFormatter;

**import** java.util.Scanner;

**public** **class** HealthBox {

**private** LocalDate date;

**private** LocalTime time;

**private** String zone;

**private** **void** getReminder() {

**if** (date == **null** || time == **null** || zone == **null**) {

System.***out***.println("No Appointments are Available");

**return**;

}

ZoneId zoneId = ZoneId.*of*(zone);

ZonedDateTime zonedDateTime = ZonedDateTime.*of*(date, time, zoneId);

DateTimeFormatter myFormatObj = DateTimeFormatter.*ofPattern*("E, MMM dd yyyy hh:mm:ss a");

String formattedDate = zonedDateTime.format(myFormatObj) + " " + getZone();

System.***out***.println(formattedDate);

}

**public** **void** printAppointment() {

**if** (date == **null** || time == **null** || zone == **null**) {

System.***out***.println("No Appointments are Available");

**return**;

}

ZoneId zoneId = ZoneId.*of*(zone);

ZonedDateTime zonedDateTime = ZonedDateTime.*of*(date, time, zoneId);

DateTimeFormatter myFormatObj = DateTimeFormatter.*ofPattern*("dd-MM-yyyy hh:mm:ss a");

String formattedDate = zonedDateTime.format(myFormatObj) + " " + getZone();

System.***out***.println(formattedDate);

}

**public** String getZone() {

**switch** (zone) {

**case** "America/Anchorage":

**return** "AKST";

**case** "Europe/Paris":

**return** "CEST";

**case** "Asia/Tokyo":

**return** "JST";

**case** "America/Phoenix":

**return** "MST";

**default**:

**return** "";

}

}

**public** **static** **void** main(String[] args) {

HealthBox app = **new** HealthBox();

Scanner sc = **new** Scanner(System.***in***);

**while** (**true**) {

System.***out***.println("1. Schedule an Appointment");

System.***out***.println("2. Print Appointment Details");

System.***out***.println("3. Reschedule an Appointment");

System.***out***.println("4. Get Reminder");

System.***out***.println("5. Cancel the Appointments");

System.***out***.println("6. Exit");

System.***out***.println("Enter an Option:");

**int** choice = sc.nextInt();

sc.nextLine();

**switch** (choice) {

**case** 1:

System.***out***.println("Enter Date (dd/MM/yyyy): ");

String appDate = sc.nextLine();

DateTimeFormatter dateFormatter = DateTimeFormatter.*ofPattern*("dd/MM/yyyy");

app.date = LocalDate.*parse*(appDate, dateFormatter);

System.***out***.println("Enter Time (HH:mm): ");

String appTime = sc.nextLine();

app.time = LocalTime.*parse*(appTime);

System.***out***.println("Available Zones are:");

System.***out***.println("A: America/Anchorage");

System.***out***.println("B: Europe/Paris");

System.***out***.println("C: Asia/Tokyo");

System.***out***.println("D: America/Phoenix");

System.***out***.println("Select the Zone:");

String zoneChoice = sc.nextLine();

**switch** (zoneChoice) {

**case** "A":

app.zone = "America/Anchorage";

**break**;

**case** "B":

app.zone = "Europe/Paris";

**break**;

**case** "C":

app.zone = "Asia/Tokyo";

**break**;

**case** "D":

app.zone = "America/Phoenix";

**break**;

**default**:

System.***out***.println("Invalid zone choice.");

**continue**;

}

System.***out***.println("Successfully Booked");

System.***out***.println("--------------------------------------");

**break**;

**case** 2:

app.printAppointment();

**break**;

**case** 3:

**if** (app.date == **null**) {

System.***out***.println("No Appointments to Reschedule");

**break**;

}

System.***out***.println("Current Appointment Date is:");

app.getReminder();

System.***out***.println("Enter the number of days to be postponed:");

**int** daysToPostpone = sc.nextInt();

sc.nextLine();

System.***out***.println("Enter new Time (HH:mm):");

String newTimeStr = sc.nextLine();

LocalTime newTime = LocalTime.*parse*(newTimeStr);

app.date = app.date.plusDays(daysToPostpone);

app.time = newTime;

System.***out***.println("Your Appointment has been rescheduled to:");

app.getReminder();

**break**;

**case** 4:

app.getReminder();

**break**;

**case** 5:

app.date = **null**;

app.time = **null**;

app.zone = **null**;

System.***out***.println("Appointment has been Cancelled!");

**break**;

**case** 6:

System.***out***.println("Exited Successfully");

sc.close();

**return**;

**default**:

System.***out***.println("Sorry, Invalid Option");

}

}

}

}

**3.**

**package** Wednesday;

**import** java.util.Random;

**public** **class** Registration<T> {

String registerId;

**public** **void** display(T obj) {

**if** (obj **instanceof** Employee) {

System.***out***.println("======Details of the Employee:========\n");

System.***out***.println("Hurray!! you availed a discount of 10%");

} **else** {

System.***out***.println("======Details of the Student:========\n");

System.***out***.println("Hurray!! you availed a discount of 22%");

}

System.***out***.println("Registration Id : " + registerId);

System.***out***.println(obj);

}

String generateRegisterId(**int** n) {

String characters = "ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789";

Random rm = **new** Random();

StringBuilder id = **new** StringBuilder();

**for** (**int** i = 0; i < n; i++) {

**int** index = rm.nextInt(characters.length());

id.append(characters.charAt(index));

}

registerId = id.toString();

**return** registerId;

}

}

**package** Wednesday;

**import** java.util.Arrays;

**public** **class** Employee {

@Override

**public** String toString() {

// **TODO** Auto-generated method stub

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

System.***out***.println("Phone No : " + Arrays.*toString*(phoneno));

System.***out***.println("Emp Id : " + employeeId);

**if** (passportno != **null**)

System.***out***.println("Passport No : " + passportno);

**if** (licenseno != 0)

System.***out***.println("License No : " + licenseno);

**if** (pancardno != **null**)

System.***out***.println("Pancard No : " + pancardno);

**if** (voterid != 0)

System.***out***.println("Voter Id : " + voterid);

**return** "";

}

**public** Employee(String name, **long**[] phoneno, **int** licenseno, **int** voterid, **int** employeeId) {

**super**();

**this**.name = name;

**this**.phoneno = phoneno;

**this**.licenseno = licenseno;

**this**.voterid = voterid;

**this**.employeeId = employeeId;

}

**public** Employee(String name, **long**[] phoneno, **int** licenseno, String pancardno, **int** employeeId) {

**super**();

**this**.name = name;

**this**.phoneno = phoneno;

**this**.licenseno = licenseno;

**this**.pancardno = pancardno;

**this**.employeeId = employeeId;

}

String name;

**long**[] phoneno;

String passportno;

**int** licenseno;

String pancardno;

**int** voterid;

**int** employeeId;

**public** Employee(String name, **long**[] phoneno, String passportno, **int** employeeId) {

**super**();

**this**.name = name;

**this**.phoneno = phoneno;

**this**.passportno = passportno;

**this**.employeeId = employeeId;

}

}

**package** Wednesday;

**import** java.util.Arrays;

**public** **class** Students {

@Override

**public** String toString() {

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

System.***out***.println("Phone No : " + Arrays.*toString*(phoneno));

**if** (passportno != **null**)

System.***out***.println("Passport No : " + passportno);

**if** (licenseno != 0)

System.***out***.println("License No : " + licenseno);

**if** (pancardno != **null**)

System.***out***.println("Pancard No : " + pancardno);

**if** (voterid != 0)

System.***out***.println("Voter Id : " + voterid);

**return** "";

}

**public** Students(String name, **long**[] phoneno, **int** licenseno, **int** voterid) {

**super**();

**this**.name = name;

**this**.phoneno = phoneno;

**this**.licenseno = licenseno;

**this**.voterid = voterid;

}

**public** Students(String name, **long**[] phoneno, **int** licenseno, String pancardno) {

**super**();

**this**.name = name;

**this**.phoneno = phoneno;

**this**.licenseno = licenseno;

**this**.pancardno = pancardno;

}

String name;

**long**[] phoneno;

String passportno;

**int** licenseno;

String pancardno;

**int** voterid;

**public** Students(String name, **long**[] phoneno, String passportno) {

**super**();

**this**.name = name;

**this**.phoneno = phoneno;

**this**.passportno = passportno;

}

}

**package** Wednesday;

**public** **class** Main {

**public** **static** **void** main(String[] args) {

Registration<Employee> reEmp=**new** Registration<Employee> ();

Registration<Students> reStu=**new** Registration<Students> ();

**long** [] phoneno= {9712345678L,9876543210L};

Employee emp1 = **new** Employee("Chaitanya", phoneno, 1234, "SRVRJKS2", 120034);

reEmp.generateRegisterId(7);

reEmp.display(emp1);

Employee emp2 = **new** Employee("pavan", phoneno, 625444554, "SRVR4544", 110054);

reEmp.generateRegisterId(7);

reEmp.display(emp2);

Employee emp3 = **new** Employee("sandip", phoneno, 32545415, "S55456", 120034);

reEmp.generateRegisterId(7);

reEmp.display(emp3);

Students stu1 = **new** Students("pavan",phoneno,1254545,"SDFGFDGF");

reStu.generateRegisterId(7);

reStu.display(stu1);

Students stu2 = **new** Students("kalyan",phoneno,1452447,"SDFGFDGF");

reStu.generateRegisterId(7);

reStu.display(stu2);

Students stu3 = **new** Students("varma",phoneno,14554454,"SDFGFDGF");

reStu.generateRegisterId(7);

reStu.display(stu3);

}

}