**Sample Java Source Code**

import java.text.NumberFormat;

import java.util.\*;

public class CarHire {

static Scanner stdIn;

// Prompts a question and returns a boolean if the user enters 'Y' instead of 'N' (any other will result

// in this function returning false)

private static boolean promptYN(String question) {

System.out.print(question + " (Y/N): ");

return stdIn.nextLine().toLowerCase().contains("y");

}

// Asks the user for a string response

private static String promptString(String question) {

System.out.print(question + ": ");

return stdIn.nextLine();

}

// Ask the users for an integral response. This will retry until one is given

private static int promptInt(String question) {

while (true) {

try {

return Integer.parseInt(promptString(question));

} catch (Exception e) {

}

}

}

// Prompts the user for a string, will keep asking if it doesn't match

// the specified pattern

private static String promptStringPattern(String question, String pattern) {

String answer = "";

do {

answer = promptString(question);

} while (!answer.matches(pattern));

return answer;

}

// Helper function: prints part of the voucher

private static void printVoucherPart(String leftSpacer, String key, String value) {

if (key != "")

key = key + ":";

System.out.printf("%-20s %-21s%s\n", leftSpacer, key, value);

}

// Format a float as currency number

private static String currency(float n) {

// Format a floating point number to the Euro (IE) currency in English

return NumberFormat.getCurrencyInstance(new Locale("en", "IE")).format(n);

}

public static void main(String[] args) {

stdIn = new Scanner(System.in);

// After the program has ran, subtract this by one to find the total cars hired

int voucherNumber = 1;

// There are only four cars available

int[] carsHired = new int[]{0, 0, 0, 0};

// Other variables used for the "daily report"

int numGPS = 0, numChildSeats = 0;

float grossRevenue = 0.0f, netRevenue = 0.0f;

float totalDiscount = 0.0f;

do {

int driverAge = promptInt("> What's the driver's age?");

if (driverAge < 18) {

System.out.println("! people under the age of 18 cannot higher cars.");

continue;

} else {

float carCost;

String carType = "Economy";

int carChoice = 1;

if (driverAge <= 24) {

// Drivers between 18-24 are charged a flat-rate and can only hire economy..

carCost = 32.0f;

} else {

carChoice = promptInt("> What car would you like to hire (enter corresponding number on LHS)?" +

"\n\t1) Economy, €14/day" +

"\n\t2) Compact, €17/day" +

"\n\t3) Intermediate, €23/day" +

"\n\t4) Platinum, €26/day\t");

switch (carChoice) {

case 1: // Economy

carType = "Economy";

carCost = 14.0f;

break;

case 2: // Compact

carType = "Compact";

carCost = 17.0f;

break;

case 3: // Intermediate

carType = "Intermediate";

carCost = 23.0f;

break;

case 4: // Platinum

carType = "Platinum";

carCost = 26.0f;

break;

default:

System.out.println("! Invalid car choice");

continue;

}

}

String name = promptStringPattern("> What's your full name?", "[a-zA-Z\\'\\- ]+");

String address1 = promptString("> What's your first address line?");

String address2 = promptString("> What's your second address line?");

String address3 = promptString("> What's your third address line?");

String licenseNumber = promptStringPattern("> What's your driver license number?", "[0-9]{7}[a-zA-Z][0-9][a-zA-Z][0-9]");

int insuranceChoice = promptInt("What insurance type would you like? (enter corresponding number on LHS)?" +

"\n\t1) Collision Damage Waiver, €4/day" +

"\n\t2) Fully Comprehensive Cover, €11/day\t");

float insuranceCost;

String insuranceType;

switch (insuranceChoice) {

case 1: // CDW

insuranceCost = 4.0f;

insuranceType = "CDW";

break;

case 2: // FCC

insuranceCost = 11.0f;

insuranceType = "FCC";

break;

default:

System.out.println("! Invalid insurance choice");

continue;

}

int extraDrivers = promptInt("> How many extra drivers will be insured?");

insuranceCost += (extraDrivers \* 8.0f);

boolean wantsChildSeats = promptYN("> Would you like a child seat for €5/day up to a maximum of €15?");

boolean wantsGPS = promptYN("> Would you like a GPS for €12/day up to a maximum of €149");

int numDays = promptInt("> How many days would you like to hire the car for?");

if (numDays <= 0) {

System.out.println("! Invalid number of days");

continue;

}

// Calculate costs of everything added up

insuranceCost \*= numDays;

carCost \*= numDays;

// Logically speaking, this age range is only allowed to hire economy cars at a higher price

// because they're high risk. But the brief specifies that they can only pay a maximum of €325 euro.

// This is specified explicitly, it does NOT say that they can't hire for more than x days because of

// this. Lucky and unlucky to be between 18 and 24 I suppose.

if (driverAge >= 18 && driverAge <= 24)

carCost = Math.min(carCost, 325.0f);

float extrasCost = 0.0f;

if (wantsChildSeats)

extrasCost += Math.min(numDays \* 5.0f, 15.0f);

if (wantsGPS)

extrasCost += Math.min(numDays \* 12.0f, 149.0f);

// Funny note: it's technically impossible to read the advertised "maximum cost" of extras

// because this discount (as described in the brief) applies to extras. Having the number

// of days high enough to reach the advertised maximums would mean the discount kicks in

// and 15% is taken off.

float thisDiscount = 0.0f;

if (numDays > 3) {

thisDiscount += carCost \* 0.15f;

thisDiscount += insuranceCost \* 0.15f;

thisDiscount += extrasCost \* 0.15f;

carCost \*= 0.85;

insuranceCost \*= 0.85;

extrasCost \*= 0.85;

}

// The only thing listed as including VAT is insurance..

float VAT = insuranceCost \* 0.195f;

final float transactionFee = 3.0f;

final float fullCost = carCost + insuranceCost + extrasCost;

String ccNumber = promptStringPattern("> What's your credit card number?", "[0-9]{16}");

String ccExpiry = promptStringPattern("> What's your credit card's expiry date (enter MM/YY)?", "(0[1-9]|10|11|12)\\/[0-9][0-9]");

// Print out the voucher

System.out.printf("%-41s VOUCHER#: %04d\n\n", "MAGNIFICENT CAR HIRE", voucherNumber);

printVoucherPart("Customer Details:", "Name", name);

printVoucherPart("", "Address", address1 + ", " + address2 + ", " + address3);

printVoucherPart("", "License Number", licenseNumber);

printVoucherPart("", "Credit Card Details", "XXXX-XXXX-XXXX-" + ccNumber.substring(12, 16));

System.out.print("\n");

printVoucherPart("Car Details:", "Car Type", carType);

printVoucherPart("", "Number of Days", String.valueOf(numDays));

printVoucherPart("", "Insurance Type", insuranceType);

printVoucherPart("", "Optional Extras", (wantsGPS || wantsChildSeats) ? "Yes" : "No");

if (wantsGPS || wantsChildSeats)

printVoucherPart("", "Cost of Extras", currency(extrasCost));

float totalCost = fullCost + VAT + transactionFee;

System.out.print("\n");

printVoucherPart("Cost details:", "Cost of Hire", currency(carCost));

printVoucherPart("", "Discount", currency(thisDiscount));

printVoucherPart("", "Cost of Insurance", currency(insuranceCost));

printVoucherPart("", "Cost - Discount", currency(fullCost));

printVoucherPart("", "VAT", currency(VAT));

printVoucherPart("", "Handling Charge", "€3");

printVoucherPart("", "", "\_\_\_\_\_\_\_\_\_\_\_\_");

printVoucherPart("", "Total Cost", currency(totalCost));

voucherNumber++;

carsHired[carChoice - 1]++;

if (wantsGPS)

numGPS++;

if (wantsChildSeats)

numChildSeats++;

totalDiscount += thisDiscount;

grossRevenue += totalCost;

netRevenue += fullCost + transactionFee;

}

} while (promptYN("> Would you like to rent another car?"));

// Print a lovely daily report using variables from before. This code will be ran when the user choose "no"

// when asked if they want to higher another car, thus triggering a report and program exit

System.out.println("\n\n====================== DAILY REPORT ======================");

System.out.printf("%-35s%s\n", "Total economy hires:", carsHired[0]);

System.out.printf("%-35s%s\n", "Total compact hires:", carsHired[1]);

System.out.printf("%-35s%s\n", "Total intermediate hires:", carsHired[2]);

System.out.printf("%-35s%s\n", "Total platinum hires:", carsHired[3]);

System.out.printf("%-35s%s\n", "Total GPS systems purchased:", numGPS);

System.out.printf("%-35s%s\n", "Total child seats purchased:", numChildSeats);

System.out.printf("%-35s%s\n", "Gross revenue generated:", currency(grossRevenue));

System.out.printf("%-35s%s\n", "Total discounted to customers:", currency(totalDiscount));

System.out.printf("%-35s%s\n", "Net revenue generated:", currency(netRevenue));

stdIn.close();

}

}