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CS1300AA  
Program 3  
Chapter 4- Cellular Telephone Bill  
Due Date:4/12/2016

**Program goal:**

The task of the program is to calculate a customer's bill for a cellular telephone. The program has to take into account of the type of service (premium or regular) and the different ways the customer will be charged depending on the type of service he/she has. The premium service price fluctuates depending on whether the minutes are used in the night or daytime. The program will output the account number of the customer, type of service, number of minutes the telephone service used, and the final bill.

**Preconditions:**

- A customer
- Number of minutes
- Type of service
- Account Number
- Flat rate chargers
- Extra rate charges

**Source Code:**

```
#include <iostream>
#include <iomanip>

using namespace std;
//Defining the variables for the program, names self-explanatory
char typeOfService;
double bill = 0;
double regularServiceFlatRate = 10.00;
double regularServiceCharge = 0.20;
double premiumDayServiceCharge = 0.10;
double premiumNightServiceCharge = 0.05;
double PremiumServiceFlatRate = 25.00;
double extraRegularRate = 0.0;
double extraDayRate = 0.0;
double extraNightRate = 0.0;
string regularService = "Regular";
string premiumService = "Premium";
double minutes;
double dayMinutes;
```

```
double nightMinutes;  
int accountNumber;
```

```
int main()  
{  
    // Make sure theres a decimal point for units that need them such as money  
    cout << showpoint << fixed;  
    cout << "Enter your Account number: ";  
    cin >> accountNumber;  
    cout << "What type of service? Enter r for regular service or p for premium service: ";  
    cin >> typeOfService;  
    //asking user the type of service  
    if(typeOfService == 'r' || typeOfService == 'R') {  
        //regular service  
        cout << endl;  
        cout << "Account Number: " << accountNumber << endl;  
        cout << "Type of Service: " + regularService << endl;  
        cout << "The flat rate is $" << setprecision(2) << regularServiceFlatRate << endl;  
        cout << "The first 50 minutes are free and you are charged $" << setprecision(2) <<  
regularServiceCharge << " per minute after 50 minutes." << endl;  
        //asking user to enter the minutes  
        cout << "Enter amount of minutes customer used: ";  
        cin >> minutes;  
        if(minutes <= 50) {  
            //bill does not change from the flat rate  
            bill = regularServiceFlatRate;  
            cout << noshowpoint << setprecision(0) << fixed;  
            cout << "Customer used " << minutes << " minutes" << endl;  
            cout << showpoint << setprecision(2);  
            cout << "Extra minute charge total charge: $" << extraRegularRate << endl;  
            cout << "Amount Due: $" << bill << endl;  
        }  
        if(minutes > 50) {  
            //bill will increase every extra minute used by $0.20  
            extraRegularRate = (minutes - 50) * regularServiceCharge;  
            bill = regularServiceFlatRate + extraRegularRate;  
            cout << noshowpoint << setprecision(0) << fixed;
```

```

        cout << "Customer used " << minutes << " minutes" << endl;
        cout << showpoint << setprecision(2);
        cout << "Extra minute charge total charge: $" << extraRegularRate << endl;
        cout << "Amount Due: $" << bill << endl;
    }
}
// if p is entered go to premium service
else if(typeOfService == 'p' || typeOfService == 'P') {
    cout << endl;
    cout << "Account Number: " << accountNumber << endl;
    cout << "Type of Service: " + premiumService << endl;
    cout << "The flat rate is $" << setprecision(2) << PremiumServiceFlatRate << endl;
    cout << "From 6:00am to 6:00pm, the first 75 minutes are free then you charged $" <<
setprecision(2) << premiumDayServiceCharge << " per minute after 75 minutes." << endl;
    cout << endl;
    cout << "From 6:00pm to 6:00am, the first 100 minutes are free then you charged $" <<
setprecision(2) << premiumNightServiceCharge << " per minute after 100 minutes." << endl;
    //enter amount of minutes for day
    cout << endl;
    cout << "Enter amount of minutes customer used during the day: ";
    cin >> dayMinutes;
    //if the minutes is less than 75, same as the flat rate
    if(dayMinutes <= 75) {
        bill = PremiumServiceFlatRate;
        cout << noshowpoint << setprecision(0) << fixed;
        cout << "Customer used " << dayMinutes << " day minutes" << endl;
    }
    //calculate the bill for the day minutes
    if(dayMinutes > 75) {
        extraDayRate = (dayMinutes - 75) * premiumDayServiceCharge;
        bill = PremiumServiceFlatRate + extraDayRate;
        cout << noshowpoint << setprecision(0) << fixed;
        cout << "Customer used " << dayMinutes << " day minutes" << endl;
    }
}
//taking in night minutes

```

```

    cout << "Enter amount of minutes customer used during the night: ";
    cin >> nightMinutes;
    //bill will remain the same if minutes don't exceed the free minutes allowed
    if(nightMinutes <= 100) {
        bill = bill;
        cout << noshowpoint << setprecision(0) << fixed;
        cout << "Customer used " << nightMinutes << " night minutes" << endl;

    }
    //The extra minutes will be added on to the current bill from the day, no need to apply flat
rate again
    if(nightMinutes > 100) {
        extraNightRate = (nightMinutes - 100) * premiumNightServiceCharge;
        bill = bill + extraNightRate;
        cout << noshowpoint << setprecision(0) << fixed;
        cout << "Customer used " << nightMinutes << " night minutes" << endl;

    }
    cout << endl;
    cout << "Total Minutes: " << dayMinutes + nightMinutes << endl;
    cout << showpoint << setprecision(2);
    cout << "Extra day minute charge total charge: $" << extraDayRate << endl;
    cout << "Extra night minute charge total charge: $" << extraNightRate << endl;
    cout << "Extra total minute charge total charge: $" << extraDayRate + extraNightRate <<
endl;
    cout << "Amount Due: $" << bill << endl;
}
//if user does not enter a valid service to being with, program will tell you to enter a valid one
else {
    cout << "Enter a valid service please" << endl;
}

    return 0;
}

```

**Postconditions:**

Output the customer's account number, minutes, service used, and the amount due.

**Results/Output:****If service is r or R:****If service is r and don't exceed 50 minutes:**

Enter your Account number: 1524250

What type of service? Enter r for regular service or p for premium service: R

Account Number: 1524250

Type of Service: Regular

The flat rate is \$10.00

The first 50 minutes are free and you are charged \$0.20 per minute after 50 minutes

Enter amount of minutes customer used: 47

Customer used 47 minutes

Extra minute charge total charge: \$0.00

Amount Due: \$10.00

**If minutes exceed 50:**

Enter your Account number: 1530443

What type of service? Enter r for regular service or p for premium service: r

Account Number: 1530443

Type of Service: Regular

The flat rate is \$10.00

The first 50 minutes are free and you are charged \$0.20 per minute after 50 minutes

Enter amount of minutes customer used: 250

Customer used 250 minutes

Extra minute charge total charge: \$40.00

Amount Due: \$50.00

**If service is p or P:**

**If both day and night minutes don't exceed free limit:**

Enter your Account number: 12304

What type of service? Enter r for regular service or p for premium service: p

Account Number: 12304

Type of Service: Premium

The flat rate is \$25.00

From 6:00am to 6:00pm, the first 75 minutes are free then you charged \$0.10 per minute after 75 minutes.

From 6:00pm to 6:00am, the first 100 minutes are free then you charged \$0.05 per minute after 100 minutes.

Enter amount of minutes customer used during the day: 73

Customer used 73 day minutes

Enter amount of minutes customer used during the night: 99

Customer used 99 night minutes

Total Minutes: 172

Extra day minute charge total charge: \$0.00

Extra night minute charge total charge: \$0.00

Extra total minute charge total charge: \$0.00

**If day exceeds free limit but night does not:**

What type of service? Enter r for regular service or p for premium service: P

Account Number: 435

Type of Service: Premium

The flat rate is \$25.00

From 6:00am to 6:00pm, the first 75 minutes are free then you charged \$0.10 per minute after 75 minutes.

From 6:00pm to 6:00am, the first 100 minutes are free then you charged \$0.05 per minute after 100 minutes.

Enter amount of minutes customer used during the day: 176

Customer used 176 day minutes

Enter amount of minutes customer used during the night: 51

Customer used 51 night minutes

Total Minutes: 227

Extra day minute charge total charge: \$10.10

Extra night minute charge total charge: \$0.00

Extra total minute charge total charge: \$10.10

Amount Due: \$35.10

**If night exceeds free limit but day does not:**

What type of service? Enter r for regular service or p for premium service: p

Account Number: 802

Type of Service: Premium

The flat rate is \$25.00

From 6:00am to 6:00pm, the first 75 minutes are free then you charged \$0.10 per minute after 75 minutes.

From 6:00pm to 6:00am, the first 100 minutes are free then you charged \$0.05 per minute after 100 minutes.

Enter amount of minutes customer used during the day: 51

Customer used 51 day minutes

Enter amount of minutes customer used during the night: 599

Customer used 599 night minutes

Total Minutes: 650

Extra day minute charge total charge: \$0.00

Extra night minute charge total charge: \$24.95

Extra total minute charge total charge: \$24.95

Amount Due: \$49.95



**If both day and night exceed limit:**

Enter your Account number: 612

What type of service? Enter r for regular service or p for premium service: p

Account Number: 612

Type of Service: Premium

The flat rate is \$25.00

From 6:00am to 6:00pm, the first 75 minutes are free then you charged \$0.10 per minute after 75 minutes.

From 6:00pm to 6:00am, the first 100 minutes are free then you charged \$0.05 per minute after 100 minutes.

Enter amount of minutes customer used during the day: 353

Customer used 353 day minutes

Enter amount of minutes customer used during the night: 591

Customer used 591 night minutes

Total Minutes: 944

Extra day minute charge total charge: \$27.80

Extra night minute charge total charge: \$24.55

Extra total minute charge total charge: \$52.35

**If service input not valid:**

Enter your Account number: 714

What type of service? Enter r for regular service or p for premium service: G

Enter a valid service please

## **Reflection**

### **Overview:**

This program needs the use of control structures in order to be successful because the customer gets a different bill depending on all the inputs. The first variable that alters the flow of the program is the type of service the customer has. The regular service has its own flat rate plus an additional 20 cents after every minute passed 50 minutes so two control structures are needed for that. The premium rate has its own flat rate plus different day and night minute charges similar to the regular service causing four different control structures. According to the user inputs, the program I designed will calculate the correct charges on the account.

### **Problems and Solutions:**

I understood the program fairly easy since it was just some math and nested if, else if, and else statements. The only problem I had is to see if I can implement a switch statement but I figured the values aren't specific enough to implement one beside asking for which service the customer has. Even then, I figured it would be easier to nest everything in a big if, else if, and else statement.

### **Lessons Learned:**

I learned that even though switch statements can be useful in control structures, I have rarely ever seen it used in actual programs so I tend to stay away from them. I think it is because they are rarely a good number of specific options. If and else statements work for specific options and broader options such as the variable being less than a certain value.

