	Air University - Aerospace and Aviation Campus, Kamra **Department of Computer Science**

Programming Fundamental(CS111)

Assignment # 02

[CLO-2, Taxonomy Level-C3, PLO-2]

Solution

Course: BSCS-1 **Semester: 1st (**Fall 2023)

Due Date: 27/10/2023 **Total** Marks**:** 30

Instructions

1. *Plagiarism, copy & past material will lead to the cancellation of your assignment.*
2. *Write your* Name, Reg# on the first page (title page) of your submission.
3. No late submission

1.

```
//this program implements the fraction calculator

int main() {
    int numerator1, denominator1, numerator2, denominator2;
    char op;

    cout << "Please enter the first fraction (in the form of a/b): ";

    cin >> numerator1 >> op >> denominator1;

    cout << "Please enter the second fraction (in the form of c/d): ";
    cin >> numerator2 >> op >> denominator2;

    // Calculate the sum of fractions
    int result_numerator = (numerator1 * denominator2) + (numerator2 *
denominator1);
    int result_denominator = denominator1 * denominator2;

    cout << "Result: " << numerator1 << "/" << denominator1 << " + " <<
numerator2 << "/" << denominator2
              << " = " << result_numerator << "/" << result_denominator <<endl;

    return 0;
}
```

2.

```
 //Currency program

int main() {
    int total_amount;

    cout << "Enter the total amount in Rupees (PKR): ";
    cin >> total_amount;

    int hundred_notes = 0;
    int fifty_notes = 0;
    int twenty_notes = 0;
    int ten_notes = 0;

    // Calculate the number of 100Rs notes
    hundred_notes = total_amount / 100;
    total_amount %= 100;

    // Calculate the number of 50Rs notes
    fifty_notes = total_amount / 50;
    total_amount %= 50;

    // Calculate the number of 20Rs notes
    twenty_notes = total_amount / 20;
    total_amount %= 20;

    // The remaining amount is for 10Rs notes
    ten_notes = total_amount / 10;

    // Display the number of each type of note to be returned
    cout << "100 Rs Notes: " << hundred_notes << endl;
    cout << "50 Rs Notes: " << fifty_notes << endl;
    cout << "20 Rs Notes: " << twenty_notes << endl;
    cout << "10 Rs Notes: " << ten_notes << endl;

    return 0;
}
```

3.

```
  //Cable TV Company

int main() {
    char customer_code;


    // Input for customer code (M for member, N for non-member)
    cout << "Enter customer code (M for Member, N for Non-Member): ";
    cin >> customer_code;


    if (customer_code == 'M' || customer_code == 'm') {
        // Member rates
        bill_processing_fee = 100;
        basic_service_fee = 200;

        // Input for the number of premium channels
        cout << "Enter the number of premium channels: ";
        cin >> premium_channels;

        // Calculate the bill amount for members
        int total_bill = bill_processing_fee + basic_service_fee + (premium_channels *
50);

        // Display the customer's bill
        cout << "Account Number: " << account_number << endl;
        cout << "Customer Code: Member" << endl;
        cout << "Bill Processing Fee: " << bill_processing_fee << " PKR" << endl;
        cout << "Basic Service Fee: " << basic_service_fee << " PKR" << endl;
        cout << "Premium Channels: " << premium_channels << " channels" << endl;
        cout << "Total Bill: " << total_bill << " PKR" << endl;
    } else if (customer_code == 'N' || customer_code == 'n') {
        // Non-Member rates
        bill_processing_fee = 150;
        basic_service_fee = 300;

        // Input for the number of premium channels
        cout << "Enter the number of premium channels: ";
        cin >> premium_channels;

        // Calculate the bill amount for non-members
        int total_bill = bill_processing_fee + basic_service_fee + (premium_channels *
80);

        // Display the customer's bill
        cout << "Account Number: " << account_number << endl;
        cout << "Customer Code: Non-Member" << endl;
        cout << "Bill Processing Fee: " << bill_processing_fee << " PKR" << endl;
        cout << "Basic Service Fee: " << basic_service_fee << " PKR" << endl;
        cout << "Premium Channels: " << premium_channels << " channels" << endl;
        cout << "Total Bill: " << total_bill << " PKR" << endl;
    } else {
       cout << "Invalid customer code. Please enter M for Member or N for Non-Member." ;
}

    return 0;
}
```

4.

```
//factorial program

int main() {
    int n;
    int factorial = 1;

    // Input a nonnegative integer
    cout << "Enter a nonnegative integer: ";
    cin >> n;

    // Check if the input is a nonnegative integer
    if (n < 0) {
        cout << "Factorial is undefined for negative numbers." << endl;
    } else {
        // Calculate the factorial using a loop
        for (int i = 1; i <= n; i++) {
            factorial *= i;
        }

        // Display the factorial
        cout << "Factorial of " << n << " is: " << factorial << endl;
    }

    return 0;
}
```

5.

```
//Hotel rooms calculation


int main() {
    int num_floors;
    int total_rooms = 0;
    int total_occupied = 0;

    // Input validation: Number of floors should be at least 1.
    do {
        cout << "Enter the number of floors in the hotel (must be at least 1): ";
        cin >> num_floors;
    } while (num_floors < 1);

    // Loop to gather information for each floor
    for (int floor = 1; floor <= num_floors; floor++) {
        int num_rooms_on_floor;
        int num_occupied_on_floor;

        // Input validation: Number of rooms on a floor should be at least 10.
        do {
            cout << "Enter the number of rooms on floor " << floor << " (must be
at least 10): ";
            cin >> num_rooms_on_floor;
        } while (num_rooms_on_floor < 10);

        cout << "Enter the number of rooms occupied on floor " << floor << ": ";
        cin >> num_occupied_on_floor;

        // Update total counts
        total_rooms += num_rooms_on_floor;
        total_occupied += num_occupied_on_floor;
    }

    // Calculate the percentage of rooms occupied
    double occupancy_rate = (static_cast<double>(total_occupied) / total_rooms) *
100;

    // Display the results
    cout << "Total number of rooms in the hotel: " << total_rooms << endl;
    cout << "Total number of rooms occupied: " << total_occupied << endl;
    cout << "Total number of rooms unoccupied: " << total_rooms - total_occupied
<< endl;
    cout << "Occupancy rate: " << occupancy_rate << "%" << endl;

    return 0;
}
```