

# Introduction:

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Welcome to assignment 2, where you will build a single C console application to demonstrate your understanding of essential control structures: if-else statements, for and while loops, break and continue statements, and switch-case. These control structures are fundamental in programming and will empower you to develop efficient solutions to various problems within a single application.

## Assignment Instructions:

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### Control Structure Menu (40 points)

**Create a C console application with a menu that allows the user to select one of the following operations:**

1. Check if a number is even or odd.
2. Display the number of digits in an integer.
3. Display the multiplication table for a number.
4. Calculate the factorial of a positive integer.
5. Draw a full pyramid given a number of rows.
6. Quit the application.

The application:

1. The application should take an input from the user for selection an operation, from **1 - 6**.
2. It should then ask the user for a **positive integer**: `<input>`, for performing the operations.
3. It should only stop if the user selects option **6**.
4. The application will cycle back to the menu operation options once an operation is completed.
5. `<choice> is an invalid choice!` printed, and cycle back to the menu operation options if the choice is `<1 or >6`.

### Part I: if-else Statement (5 points)

**For option 1, your program should:**

1. Use an if-else statement to check if the `<input>` is even or odd.
2. Display a message indicating whether the `<input>` is even or odd.

```
Enter a positive integer: 1
1 is odd
```

### Part II: do-while loop (5 points)

**For option 2, your program should:**

1. Use a do-while loop to get the number of digits of the `<input>` integer.

```
Enter a positive integer: 456
456 has 3 digits
```

**Part III: for Loop (10 points)****For option 3, your program should:**

1. Use a for loop to display the multiplication table for that `<input>` integer from 1 to 10.

```
Enter a positive integer: 5
5 * 1 = 5
5 * 2 = 10
5 * 3 = 15
5 * 4 = 20
5 * 5 = 25
5 * 6 = 30
5 * 7 = 35
5 * 8 = 40
5 * 9 = 45
5 * 10 = 50
```

**Part IV: while Loop (15 points)****For option 4, your program should:**

1. Use a while loop to calculate and display the factorial of the `<input>`.

```
Enter a positive integer: 5
Factorial of 5 is 120
```

**Part V: break and continue (15 points)****For option 5, your program should:**

1. Use nested for loops to print out a full pyramid with the height of the `<input>`.

```
Enter a positive integer: 6
      *
    * * *
  * * * * *
* * * * * * *
* * * * * * * *
* * * * * * * *
* * * * * * * *
```

**Part VI: Exit Application (10 points)**

**For option 6, your program should:**

1. Quit the application.

```
Enter selection: 6
Quitting Application...
```

## Submission Requirements:

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- You are required to submit a well-commented, single C source code file named solution.c that contains the entire interactive console application.
- Your program should minimally reproduce the output shown in the examples above.