



CL-1004 OBJECT ORIENTED PROGRAMMING LAB

Assignment # 01

INSTRUCTOR: MUHAMMAD ABDULLAH

SEMESTER FALL 2021

ASSIGNMENT #01

Operators, Conditional Statements, Loops, Functions and Arrays

Object Oriented Programming – Lab

Due Date: 12th October 2021

Total Marks: 80

A note of warning: Start work on assignments as soon as they are given. Do not underestimate the demanding nature of this course. Expect the system to crash the night before your program is due. Aim to have it done the day before.

Submit the assignment on [Google Classroom and printed form](#). Do not email me assignments after due date. It will not be accepted in any case. **Students are required to submit actual content written in Pdf. Hand written/ Scanned assignments will not be accepted.**

Note: Name of the file should start with your Serial Number followed by Roll number, Name and at the end assignment number (**10_p190001_Name_Assign#01**)

i.e. 10_p190001_Ali_Assign#01

Operators

- 1) Write a C++ program that will convert dollar to rupees (Dollar to Rupees Conversion Calculator).
- 2) Write a C++ program that will convert rupees to dollar (Rupees to Dollar Conversion Calculator).
- 3) Write a C++ program that will convert centigrade to Fahrenheit.
- 4) Take student name and marks of your 2nd semester from user and then generate DMC which will contain obtained marks out of total and percentage.
- 5) In lab manual 2.3 math functions (Other Math Functions) are listed in the form of table you all are directed to implement all these functions using C++ program.

Conditional Statements

if else

1. Find positive and negative numbers using if else statement.
2. Find even and odd numbers using if else statement.
3. Find leap year using if else statement.
4. Write a C++ program which will get two numbers from user and find large number between them using if else statement.

Leap year Hints: common year has 365 days (feb 28 days)

Leap year has 366 days (feb 29 days)

`year%4==0` leap year

if-else-if else

1. Find positive, negative and neutral numbers using if-else-if else statement.
2. Take value of temperature from user and find status of weather accordingly.
3. Take value of percentage from user and find grades based on percentage value.
4. Make a calculator using if-else-if else statement which perform the addition, subtraction, multiplication, division and remainder operations. Take values and operator from user on runtime.

Conditional Operator (?:)

1. Write a C++ program which will get two numbers from user and find large number between them using conditional operator.
2. Find positive and negative numbers using conditional operator.
3. Find even and odd numbers using conditional operator.

Switch Statement

1. Make a C++ calculator using switch statement which perform the following addition, subtraction, multiplication, division and remainder value. Take value and operator from user on runtime.
2. Write a C++ program using switch statement which get month name from user and display month number accordingly.

Loops

for loop

1. Write a C++ program which display first 10 number using for loop.
2. Write a C++ program which display even and odd number using for loop.
3. Take a number from user and make a table of that number using for loop.
4. Take a number from user and find factorial of that number using for loop.

while loop

1. Write a C++ program which display first 10 number using while loop.
2. Write a C++ program which display even and odd number using while loop.
3. Take a number from user and make a table of that number using while loop.
4. Take a number from user and find factorial of that number using while loop.
5. Make a calculator using if-else-if else statement which perform addition, subtraction, multiplication, division and remainder operations. Take values and operator from user on runtime. Use while loop for user choice. Means after performing one operation program will ask from user "do you want to do another calculation(yes/no)?". If user press yes then user will enter number 1, number 2 and operator for calculation and if user press no then terminate the loop.

do while loop

1. Write a C++ program which display first 10 number using do while loop.
2. Write a C++ program which display even and odd number using while loop.
3. Take a number from user and make a table of that number using do while loop.
4. Take a number from user and find factorial of that number using do while loop.
5. Make a calculator using if-else-if else statement which perform addition, subtraction, multiplication, division and remainder operations. Take values and operator from user on runtime. Use do while loop for user choice. Means after performing one operation program will ask from user "do you want to do another calculation(yes/no)? ". If user press yes then user will enter number 1, number 2 and operator for calculation and if user press no then terminate the loop.

Nested for loop

1. Write a C++ program that will display * in the following pattern.

```
*****
*****
***
**
*
```

2. Write a C++ program that will display numbers in the following pattern.

```
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

3. Write a C++ program to print the output as shown below. Use "setw" manipulator.

```
  *
 **
*****
*****
```

4. Write a C++ program to print the output as given below by using the "for" loop structure and "setw" manipulator.

```
XXXXX
XXXX
XXX
XX
X
```

Arrays

1-D Arrays

1. Write a C++ program that will add two single dimensional array elements. Take values from user at runtime.
2. How to generate random number in C++, write a simple C++ program that will generate random number from 1 to 100?
3. Write a C++ program that will add two single dimensional arrays elements using random numbers?
4. Write a C++ program that will find maximum number in an array?
5. Write a C++ program that will find minimum number in an array?

2-D Arrays

1. Write a C++ program that will create 2D array using random numbers and then show these values.
2. Write a C++ program that will find maximum and minimum number in 2D array. Note array elements must be random values.
3. Write a C++ program that will add two 2D arrays elements. Take values from user at runtime. Note display values of 1st, 2nd and their resultant array.
Hints: A will be the 1st array, B will be the 2nd array and C will be resultant array.
Note: Follow Mathematics Matrix Addition Rules
4. Write a C++ program that will multiply two 2D arrays elements. Take values from user at runtime. Note display values of 1st, 2nd and their resultant array.
Hints: A will be the 1st array, B will be the 2nd array and C will be resultant array.
Note: Follow Mathematics Matrix Multiplication Rules

Functions

1. Write function in C++ that will calculate table of a number in C++. Number must be passed from calling function as an argument to function parameters.
2. Write function in C++ that will find factorial of a number. Number must be passed from calling function as an argument to function parameters.
3. Update your calculator using functions (Calculator you implemented in do while loop section question no. 05. Create separate functions for addition, subtraction, division, multiplication and remainder operations).

4. Write user defined function namely **arrayFunction()** in C++ which will initialize array by taking values from user at run time and then call this function in main function which will return this array from the calling function to the called function (to the main function) and then show all items of this array in main function using both for and enhanced for loop.
5. Write a program that check the type of the value and determine the data type of the value. In this program, you will develop a Type checking program (Type Checker).

```
int main() {  
    printType('A');  
    return 0;  
}
```

If the argument of printType(true) is true or false, it will invoke a function inside and print a message “true is a boolean”. If it is int 463287462 then it should display “4632874 is Integer”. The sample output format is as follows:

1.24353 is double data type

334345345 is an integer data type

1 is boolean data type

A is a character data type

Game of Random Number

Generate random number from 0 to 100 and after generating random number show this message to user **“Number generated, try to guess it”**. Take any number from user using cin statement by showing message **“Enter your guess number:”** for guessing. Compare this guess number to the randomly generated number. If this guess number is greater than randomly generated then show message like **“Your number is high, please try again”** and if this guess number is less than randomly generated number then show message i.e. **“Your number is low, please try again”**. Continue this process using while or do while loop until you find random number. After finding random number show this message **“You found random number in count attempts”**. Initialize count variable to count number of attempts/tries for finding a number. If the count value is less than or equal to 5 then show **“Excellent”** message else show **“Good”** message to the user.