**Basic Program**

1. Write a C# Sharp program to print Hello and your name in a separate line.
2. Write a C# Sharp program to print the sum of two numbers.
3. Write a C# Sharp program to print the result of dividing two numbers.
4. Write a C# Sharp program to print the results of the specified operations.  
   Test data:

-1 + 4 \* 6

( 35+ 5 ) % 7

14 + -4 \* 6 / 11

2 + 15 / 6 \* 1 - 7 % 2

1. Write a C# Sharp program to swap two numbers using third variable.
2. Write a C# Sharp program to swap two numbers without using third variable.
3. Write a C# Sharp program to print the output of the multiplication of three numbers entered by the user.
4. Write a C# Sharp program to print on screen the output of adding, subtracting, multiplying and dividing two numbers entered by the user.
5. Write a C# Sharp program that prints the multiplication table of a number as input.
6. Write a C# Sharp program that takes four numbers as input to calculate and print the average.
7. Write a C# Sharp program that takes three numbers (x,y,z) as input and outputs (x+y).z and x.y + y.z.
8. Write a C# program that takes a number as input and displays it four times in a row (separated by blank spaces), and then four times in the next row, with no separation. You should do it twice: Use the console. Write and use {0}.

*Test Data:*  
Enter a digit: 25  
*Expected Output:*  
25 25 25 25  
25252525  
25 25 25 25  
25252525

1. Write a C# program that takes a number as input and displays a rectangle of 3 columns wide and 5 rows tall using that digit.

*Test Data:*  
Enter a digit: 25  
*Expected Output:*  
25 25 25 25  
25252525  
25 25 25 25  
25252525

1. Write a C# program to convert Celsius degrees to Kelvin and Fahrenheit.
2. Write a C# program that removes a specified character from a non-empty string using the index of a character.

*Test Data:*  
w3resource  
*Sample Output:*  
wresource  
w3resourc  
3resource

1. Write a C# program to create a new string from a given string where the first and last characters change their positions.

*Test Data:*  
w3resource  
Python  
*Sample Output:*  
e3resourcw  
nythoP  
x

1. Write a C# program to create a string from a given string (length 1 or more) with the first character added at the front and back.  
   *Sample Output:*  
   Input a string : The quick brown fox jumps over the lazy dog.  
   TThe quick brown fox jumps over the lazy dog.T
2. Write a C# program to check a pair of integers and return true if one is negative and one is positive.  
   *Sample Output:*  
   Input first integer:  
   -5  
   Input second integer:  
   25  
   Check if one is negative and one is positive:  
   True
3. Write a C# program to compute the sum of two given integers. If two values are the same, return the triple of their sum.
4. Write a C# program to get the absolute value of the difference between two given numbers. Return double the absolute value of the difference if the first number is greater than the second number.
5. Write a C# program to check the sum of the two given integers. Return true if one of the integers is 20 or if their sum is 20.
6. Write a C# program to check if the given integer is within 20 of 100 or 200.  
   *Sample Output:*  
   Input an integer:  
   25  
   False
7. Write a C# program to convert a given string into lowercase.  
   *Sample Output:*  
   write a c# sharp program to display the following pattern using the alphabet.
8. Write a C# program to find the longest word in a string.  
   Test Data: Write a C# Sharp Program to display the following pattern using the alphabet.  
   *Sample Output:*  
   following
9. Write a C# program to print odd numbers from 1 to 99. Prints one number per line.  
   *Sample Output:*  
   Odd numbers from 1 to 99. Prints one number per line.  
   1  
   3  
   5  
   7  
   9  
   ...  
   95  
   97  
   99
10. Write a C# program to compute the sum of the first 500 prime numbers.  
    *Sample Output:*  
    Sum of the first 500 prime numbers:  
    824693
11. Write a C# program and compute the sum of an integer's digits.  
    *Sample Output:*  
    Input a number(integer): 12  
    Sum of the digits of the said integer: 3
12. Write a C# program to reverse the words of a sentence.  
    *Sample Output:*  
    Original String: Display the pattern like pyramid using the alphabet.  
    Reverse String: alphabet. the using pyramid like pattern the Display
13. Write a C# program to find the size of a specified file in bytes.  
    *Sample Output:*  
    Size of a file: 31
14. Write a C# program to convert a hexadecimal number to a decimal number.  
    *Sample Output:*  
    Hexadecimal number: 4B0  
    Convert to-  
    Decimal number: 1200

**Challenge 2:**

1. Program to Find Sum of N Numbers using Recursion.
2. [C# Program to Multiply two Floating Point Numbers](https://techstudy.org/csharp/Csharp-Program-to-Multiply-two-Floating-Point-Numbers)
3. Reverse Number using Recursion in C
4. C# Program to Swap Values of Two Variables without using third variable.
5. Prime Number using Recursion in C
6. C# Program to find the Size of data types.
7. Reverse Number using Recursion in C
8. C# Program to Print ASCII Value of character.
9. Write a C# Sharp program to find the length of a string without using a library function.
10. C# Program to check whether an integer entered by the user is odd or even.
11. Write a C# Sharp program to separate individual characters from a string.
12. C# Program to Find the Largest Number using Conditional Operator.
13. Write a program in C# Sharp to print individual characters of the string in reverse order.
14. C# Program to Check whether an alphabet is a vowel or not.
15. Write a program in C# Sharp to count the total number of words in a string.
16. C# program to check whether a triangle can be formed by the given value for the angles.
17. Write a program in C# Sharp to compare two strings without using a string library functions.
18. C# program to count total number of notes in entered amount.
19. Write a program in C# Sharp to count the number of alphabets, digits and special characters in a string.
20. Write C# program to print alphabets from a to z.
21. Write a program in C# Sharp to copy one string to another string and print number of characters copied.
22. Write C# program to print all natural numbers in reverse order
23. Write a C# Sharp program to count the number of vowels or consonants in a string.
24. Write a C# Sharp program to find the maximum number of characters in a string.
25. Write a C# Sharp program to sort a string array in ascending order.
26. Write a program in C# Sharp to extract a substring from a given string without using the library function.
27. Write a C# Sharp program to check whether a given substring is present in the given string.
28. Write a C# Sharp program to read a sentence and replace lowercase characters with uppercase and vice-versa.
29. Write a program in C# Sharp to search for the position of a substring within a string.
30. Write a C# Sharp program to check whether a character is an alphabet and not and if so, check for the case(upper or lower).
31. Write a program in C# Sharp to find the number of times a substring appears in a given string.

**Challenge 3: Conditional programs**

1. Write a C# Program to check whether an integer entered by the user is odd or even
2. Write a C# program to check leap year using conditional Operator.
3. Write a C# program to check number is positive, negative or zero.
4. Write a C# program to print day name of week.
5. Write a C# program to accept two integers and check whether they are equal or not.
6. Write a C# program to detrermine a candidate’s age is eligible for casting the vote or not.
7. Write a C# program to find the eligibility of admission for an engineering course based on the criteria.
8. Write a C# program to calculate the total marks, percentage and division of student.
9. Write a C# program to enter month number and print number of days in month using switch case
10. Write a C# program to accept a coordinate point in an XY coordinate system and determine in which quadrant the coordinate point lies.
11. Write a C# program to determine eligibility for admission to a professional course based on the following criteria:

***Eligibility Criteria :***

***Marks in Maths >=65 and Marks in Phy >=55 and Marks in Chem>=50 and Total in all three subject >=190 or Total in Maths and Physics >=140***

1. Write a program in C to calculate and print the electricity bill of a given customer. The customer ID, name, and unit consumed by the user should be captured from the keyboard to display the total amount to be paid to the customer.

**The charge are as follow :**

|  |  |
| --- | --- |
| **Unit** | **Charge/unit** |
| upto 199 | @1.20 |
| 200 and above but less than 400 | @1.50 |
| 400 and above but less than 600 | @1.80 |
| 600 and above | @2.00 |

If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/-

***Test Data :***

1001

James

800

Expected Output :

Customer IDNO :1001

Customer Name :James

unit Consumed :800

Amount Charges @Rs. 2.00 per unit : 1600.00

Surchage Amount : 240.00

Net Amount Paid By the Customer : 1840.00

1. Write a program in C# to read any digit (0-9) and display it in the word using switch case.
2. Write a C# program which computes the area of various geometrical shapes using a menu-driven approach.
3. Write a C# Program to print Fibonacci Series
4. Write a C# Program to Find First N Fibonacci Numbers
5. Write a C# Program to Find Nth Fibonacci Number using Recursion
6. Write a C# Program to Find the Factorial of a Number
7. Write a C# Program to Find the Factorial of a Number using Recursion
8. Write a C# Program to Check Whether a Given Number is Perfect Number
9. Write a C# Program to Check Armstrong Number
10. Write a C# Program to Display Armstrong Number between Two Intervals
11. Write a C# Program to Find Nth Armstrong Number when max armstrong number should be 31.
12. Write a C# Strong Number Program in C using While Loop
13. Write a C# Print Strong Numbers from 1 to n
14. Write a c# Find Strong Numbers in a Given Range
15. Write a C# Program to Find the Minimum Range of Data Types
16. Write a C# Program to Find the Maximum Range of Data Types
17. Write a C# Program to Demonstrate Boxing Operations
18. Write a C# Program to Perform Unboxing Operation
19. Write a C# Program to find Product of 2 numbers using recursion.
20. Write a C# Program to Find All Substrings in a String
21. Write a C# Program to Convert Characters of a String to Opposite Case.
22. Write a C# Program to Count the Number of Lines in a String
23. Write a C# Program to print the Frequency of “is” and "the" Word in a String in C#
24. Write a C# Program to print string in Pasal case
25. Write a C# Program to Convert a Positive Number into Negative
26. Write a C# Program to Find the Average of All the Array Elements
27. Write a C# Program to Merge Two Arrays into Third Array.
28. Write a C# program that converts alternate lower case letter and upper case letter ("A" - "Z"). For example, if the user enters "Shivam" then the program will show "ShIvAm" on the screen.
29. Write a C# program that takes three points (x1, y1), (x2, y2) and (x3, y3) from the user and the program will check wheteher or not all the three points fall on one straight line.
30. Write a C# program that takes coordinates (x, y) of a center of a circle and its radius from the user, the program will determine whether a point lies inside the circle, on the circle or outside the circle.
31. Write a C# program using a switch statement that takes one value from the user and asks about the type of conversion and then performs a conversion depending on the type of conversion. If user enters:

I -> convert from inches to centimeters.

G -> convert from gallons to liters.

M -> convert from mile to kilometer.

P -> convert from pound to kilogram.

If the user enters any other character then show a proper message.

1. In a company, worker efficiency is determined on the basis of the time required for a worker to complete a specific job. If the time taken by the worker is between 2 - 3 hours, then the worker is said to be highly efficient. If the time required by the worker is 3 - 4 hours, then the worker is ordered to increase their speed. If the time taken is 4 - 5 hours then the worker is given training to improve his speed and if the time taken by the worker is more than 5 hours then the worker must leave the company. If the time taken by the worker is input through the keyboard then find the efficiency of the worker.
2. Write a C# program using conditional operators to determine whether a year entered through the keyboard is a leap year or not.
3. Write a C# program using a switch statement that takes one character value from the user and checks whether the entered value is an arithmetic operator, logical operator, conditional operator, relational operator, or something else.
4. Write a C# program that prints an identity matrix using a for loop, in other words takes a value n from the user and shows the identity table of size n \* n. Write a C# program using a for loop that prints the following series.

Example: 1 2 4 8 16 21 64 128 …nth iteration.

1. Write a C# program using a for loop that prints the following output (you need to find a pattern to print letters in this order):

Example: A B D H P

1. Write a C# program using a loop that prints the following output.

Example: 1 2 2 3 3 3 4 4 4 4 5 5 5 5 5 6 6 6 6 6 6 . . . nth iteration

1. Write a C# program to print all the ASCII values and their equivalent characters using a while loop. The ASCII values vary from 0 to 255.
2. Write a C# program to print all the ASCII values and their equivalent characters using a do-while loop. The ASCII values vary from 10 to 255.
3. Write a C# program that takes one value from the user and checks whether the entered value is a character, integer or special symbol.
4. Write a C# program that takes an integer as an input from the user and prints if it is a prime or composite number.
5. Write a C# program that prints the Fibonacci series using a loop.

Example : 1 1 2 3 5 8 13 21 34 …

1. Write a program using a for loop that prints the following output on the screen.

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1. Write a C# program using a for loop that prints the following output on the screen.

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1. Write a C# program to print all Armstrong numbers between 1 and 500. If the sum of the cubes of each digit of the number is equal to the number itself, then the number is called an Armstrong number.
2. Write a C# program using a for loop that prints the following output on the screen.

$$$$$$$$$$

$ $

$ $

$ $

$$$$$$$$$$

1. Write a C# program using a loop that takes one value n from the user and shows the factorial of all prime numbers that are less then n,

example if n = 10 then the program will print the factorial of 2, 3, 5 and 7.

1. Write a C# program to display the sum of the following series using a loop.

1\*x + 2\*x2 + 3\*x3 + 4\*x4 + 5\*x5 + … + n\*xn

1. Write a C# program to display the sum of the following series, in other words the sum of the factorial of the odd series.

example: 1! + 3! + 5! + 7! + 9! + . . . + n!

1. Write a C# program to display the sum of the following series.

Example: 2/1! + 4/3! + 6/5! + 8/7! + 10/9! + . . . + n/(n-1)

1. Write a C# program to display the sum of the following series, in other words the sum of the factorial of the odd series multiplied by x where the power of x is the square of the corresponding number.

Example: X1\*1! + X9\*3! + X25\*5! + X49\*7! + X81\*9! + . . . + Xn2\*n!

1. Write a C# program that displays the following output on the screen.

Example:

1 2 3 4 5

1 4 9 16 25

1 8 27 64 125

1. Write a C# program that displays the following output on the screen.

####$####

###$#$###

##$###$##

#$#####$#

$#######$

1. Write a C# program to produce the following Output

A B C D E F G F E D C B A

A B C D E F \*F E D C B A

A B C D E \*\*\* E D C B A

A B C D \*\*\*\*\* D C B A

A B C \*\*\*\*\*\*\*\* C B A

A B \*\*\*\*\*\*\*\*\*\* B A

A \*\*\*\*\*\*\*\*\*\*\*\* A

1. Write a C# program to produce the following output:

1

2 3

4 5 6

7 8 9 10

1. Write a C# program that takes 10 values from the user in an array and then shows the number of prime values in the array.
2. Write a C# program that copies the values of one array to a second array in reverse order.
3. Create two arrays, student\_rollno and student\_marks, both of the same size.

The first array will save the rollnos of students and the second array will save the marks of students against his rollno.

Example if student\_rollno[0] contains 197 then student\_marks[0] will contain the marks of roll no 197.

You need to print the roll number of the student with maximum marks.

1. Write a program that will input a charater "a" value from the user. You need to use a switch statement to decide if the value of a is "t" then you need to call the table function. If the value of a is "f" then call the factorial function, if the value of a is "p" then call the prime function, if the value of a is "s" then call the search function.

You need to write four functions in your program as in the following:

Table(int n1,n2)

Factorial(int n3)

Prime(int n4)

Search(char n5[], char c, char choice)

Table function will print the table of n1 from 1 to n2.

Factorial function will print the factorial of n3 if n3 is a multiple of 2.

Prime function will print the n4 if n4 is prime.

Search function will take the first argument n5 as an array of characters and the second element a character to be searched for in the array and the third element a character to decide which searching algorithm is to be used, in other words if the user has passed the value of c as "s" then the Search function will perform the sequential search but if the value of c is something else then the Search function will perform a binary search.

1. Write a C# three functions, max(int,int), factorial(int) and prime(int). The max function will take two arguments and will return the maximum of the two numbers to factorial(int) method. Then main function will pass this calculated factorial to the prime function that will print all prime numbers till factorial number.
2. Write a C# function that takes four arrays of the same size as arguments; array1, array2, array3 and array4. The function will multiply the corresponding values of array1 and array2 and will save the result at the same index as array3, in other words array3[0] = array1[0] \* array2[0] and so on. Then create another function and pass all four arrays to that function as an argument where you need to compare array1, array2 and array3 and save the max value in array4. In other words if array1[0] = 10, array2[0] = 5, array3[0]= 11 then you need to save the max value, in other words array4[0] = 11. In the main function, show all the values of array4.
3. If the lengths of the sides of a triangle are denoted by a, b, and c, then the area of the triangle is given by:

Area = S\*S(S-a)(S-b)(S-c)

where, S = ( a + b + c ) / 2

1. Create a class of student that stores characteristcs of a student, like studentID, studentName, studentDOB, studentRollNo, studentEmail, studentGPA of the last 5 semesters and other related information of the student. (You may set some properties Boolean and some readonly.)

Calculate the CGPA of each student using the function calculateCGPA(…).

The student with the highest CGPA will be considerd CR of the class. There should be a function that will compare the CGPA of students and will declare a student having a greater CGPA as CR.

The program should be able to take input of 5 students from the user; definitely there will be a function that will take input from the user.

You need to use a Setter for setting the values of the data members of the class and a Getter function for getting the values of the data members of the class. (You can use a property as an alternative.)

The default value for each student's GPA should be 3.0. (You need to use an array for storing GPAs of the last 5 semesters. You may simply initialize the array with 3.0 in the constructor).

All data members should be private.

Member functions can be public.

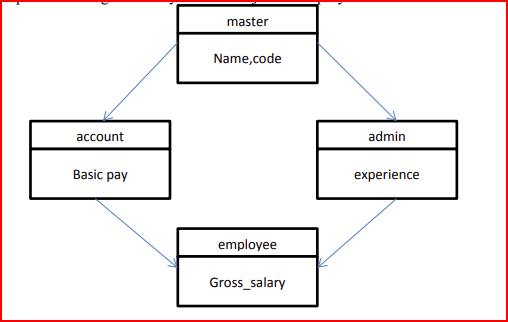
The program must be able to add two objects, in other words if we add two students then all their corresponding data members will be added one by one. (Operator Overloading).

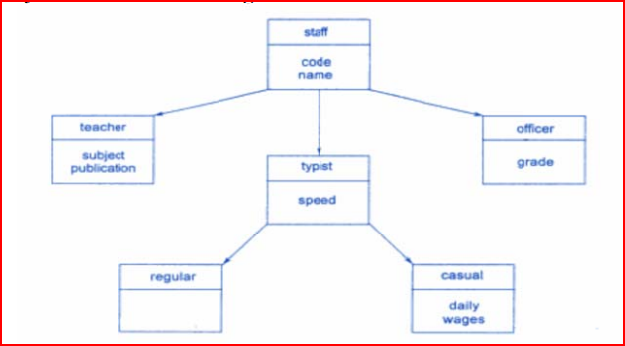
The program must contain an explicitly defined copy constructor.

StudentID and StudentGPA of the last 5 semesters must be constant or readonly.

The value of studentGPA of the last 5 semesters must be selected from a enum that may contain values {1.0, 2.0, 3.0, and 4.0}.

1. Write a C# program to declare a class ‘Account’ having data members as Account\_no and balance. Accept the data for 5 accounts and display the data of accounts having balance greater than 5000
2. Write a C# program to implement the concept of virtual base class for following figure. Accept and display information of one employee with his name, code, basic pay, experience and gross salary with the object of employee class





An education institute wishes to maintain data of its employees. The hierarchical relationships of related classes are as shown in figure. Define all the classes to represent the above hierarchy and define functions to retrieve individual information as and when required.

1. Write a C# program by using classes in which user enter the number, program will reverse the number. After reversing the number, show the sum of all numbers. For example if number is 153, the after reverse it will be 351 and the sum will be 9. Now if the sum is a odd number, then show its odd number, otherwise show even number.

Further, you are not allowed to use for loop. You can use Do while loop.

1. Write a C# program by using classes in which user enter the three angles a1, a2, and a3, and then program will check that its valid triangle or not. If it’s valid triangle, then find the factorial of a1 with while loop, and find that a2 is a palindrome number or not. If a2 is palindrome, then find the factorial of a2.
2. Write a C# program using multi-level inheritance in which the user enters the number, calculates the cube of the number, if the cube of the number is greater than 150 then print the square of the resultant cube, otherwise show the message “sorry”.
3. Suppose you are developing a hospital management system in which the user enter the patient and doctor compulsory detail, and then patient checks that the doctor is available or not.

Redundancy is a big issue. So, write your program in C# in such a way by using the inheritance that it reduce the redundancy.

You also need to draw the class diagram of the system.

1. Write a C# program to display the area of a rectangle by using a class named ‘Area’ with two member functions. The first function named as ‘Dimension’ will takes the length and breadth of the rectangle as parameters and the second function named as ‘takeArea’ returns the area of the rectangle. Assign proper data types to the data members of the classes. There should be two functions one to input/get data and the other to display the data. In main() create THREE objects of each class and assign data and then display the data of each object by calling the corresponding functions.
2. Write a C# Class having name StaticClass there should be three static data members (x,y,z). An initial value of 10 should be assigned to each data member. In default constructor x, y, and z should be incremented by 10, 20, and 30 respectively. Display this data using a static member function Display(). Create 5 objects and then display the data.
3. Create a new project, and include in it the class Person with private property age and public method Greet which will print "Hello"

Create a class "Student" and another class "Teacher", both descendants of "Person".

The class "Student" will have a public method "GoToClasses", which will write on screen "I’m going to class."

The class "Teacher" will have a public method "Explain", which will show on screen "Explanation begins". Also, it will have a private attribute "subject", a string.

The class Person must have a method "SetAge (int n)" which will indicate the value of their age (eg, 20 years old).

The student will have a public method "ShowAge" which will write on the screen "My age is: 20 years old" (or the corresponding number).

You must create another test class called "StudentAndTeacherTest" that will contain "Main" and:

Create a Person and make it say hello

Create a student, set his age to 21, tell him to Greet and display his age

Create a teacher, 30 years old, ask him to say hello and then explain.

1. Create a class "PhotoAlbum" with a private attribute "numberOfPages."

It should also have a public method "GetNumberOfPages", which will return the number of pages.

The default constructor will create an album with 16 pages. There will be an additional constructor, with which we can specify the number of pages we want in the album.

Create a class "BigPhotoAlbum" whose construction will create an album with 64 pages.

Create a test class "AlbumTest" to create an album with its default constructor,one with 24 pages, a "BigPhotoAlbum" and show the number of pages that the three albums have.

1. Define abstract class Shape with only one virtual method CalculateSurface() and fields width and height. Define two new classes Triangle and Rectangle that implement the virtual method and return the surface of the figure (height\*width for rectangle and height\*width/2 for triangle). Define class Circle and suitable constructor so that on initialization height must be kept equal to width and implement the CalculateSurface() method. Write a program that tests the behavior of the CalculateSurface() method for different shapes (Circle, Rectangle, Triangle) stored in an array.
2. All the banks operating in India are controlled by RBI. RBI has set a well defined guideline (e.g. minimum interest rate, minimum balance allowed, maximum withdrawal limit etc) which all banks must follow. For example, suppose RBI has set minimum interest rate applicable to a saving bank account to be 4% annually; however, banks are free to use 4% interest rate or to set any rates above it.

Write a program to implement bank functionality in the above scenario. Note: Create few classes namely Customer, Account, RBI (Base Class) and few derived classes (SBI, ICICI, PNB etc). Assume and implement required member variables and functions in each class.

1. We want to store the information of different vehicles. Create a class named Vehicle with two data member named mileage and price. Create its two subclasses

\*Car with data members to store ownership cost, warranty (by years), seating capacity and fuel type (diesel or petrol).

\*Bike with data members to store the number of cylinders, number of gears, cooling type(air, liquid or oil), wheel type(alloys or spokes) and fuel tank size(in inches)

Make another two subclasses Audi and Ford of Car, each having a data member to store the model type. Next, make two subclasses Bajaj and TVS, each having a data member to store the make-type.

Now, store and print the information of an Audi and a Ford car (i.e. model type, ownership cost, warranty, seating capacity, fuel type, mileage and price.) Do the same for a Bajaj and a TVS bike.