CS1002 Programming Fundamentals

Saturday, Nov 05, 2022

Course Instructor

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Serial No:

Mid II Exam
Total Time: 1 Hour
Total Marks: 50

_____
Signature of Invigilator

Roll No	Section	Signature

DO NOT OPEN THE QUESTION BOOK OR START UNTIL INSTRUCTED.
Instructions:

1. Verify at the start of the exam that you have a total of four (4) questions printed on nine (08) pages including this title page.
2. Attempt all questions on the question book and in the given order.
3. The exam is closed books, and closed notes. Please see that the area in your threshold is free of any material classified as 'useful in the paper' or else there may a charge of cheating.
4. Read the questions carefully for clarity of context and understanding of the meaning and make assumptions wherever required, for neither the invigilator will address your queries, nor the teacher/examiner will come to the examination hall for any assistance.
5. Fit in all your answers in the provided space. You may use extra space on the last page if required. If you do so, clearly mark the question/part number on that page to avoid confusion.
6. **Calculators are not Allowed.**
7. Use only your own stationery.
8. Use only permanent ink-pens. Only the questions attempted with permanent ink-pens will be considered. Any part of the paper done in lead pencil cannot be claimed for checking/rechecking.

	Q-1	Q-2	Q-3	Q-4	Total
Total Marks	20	10	10	10	**50**
Marks Obtained					

Vetted By: _____ Vetter Signature: _____

University Answer Sheet Required: No ☐ Yes ☐

National University of Computer and Emerging Sciences

Department of Computer Science **Chiniot-Faisalabad Campus**

Q1	20

Write the output of the given code and the results of the expressions in the space provided.
(Suppose there is no error)

Sr.	Code	Answer

a.	`for (int i = 1; i <= 3; ++i)`
	`{`
	`  for (int j = 1; j <= 3; ++j)`
	`  {`
	`  for (int k = 1; k <= 4; ++k)`
	`  cout << '*';`
	`  cout << endl;`
	`  }`
	`  cout << endl;`
	`}`
		****
		**** 1.3 marks
		****
		
		**** 1.3 marks
		****
		****
		
		****
		**** 1.3 marks
		****

b.	`int main()`
	`{`
	`  int temp[5];`
	`  for (int i = 0; i < 5; i++) {`
	`  temp[i] = 2 * i - 3;`
	`  }`
	`  for (int i = 0; i < 5; i++) {`
	`  cout << temp[i] << " ";`
	`  }`
	`  cout << endl;`
	`  temp[0] = temp[4];`
	`  temp[4] = temp[1];`
	`  temp[2] = temp[3] + temp[0];`
	`  for (int i = 0; i < 5; i++)`
	`  cout << temp[i] << " ";`
	`  cout << endl;`
	`}`
		-3 -1 1 3 5 2 marks
		5 -1 8 3 -1 2 marks

c.	`int a, c, t;`
	`t = 3;`
	`for (a = 1; a <= t; a++){`
	`  for (c = 1; c <= t; c++){`
	`  if (c == a || c == (t + 1 - a))`
	`  cout << "*";`
	`  else`
	`  cout << " ";`
	`  }`
	`  cout << endl;`
	`}`
		* * 1.3 marks
		  * 1.3 marks
		* * 1.3 marks

d.	`int main()`
	`{`
	`  int arr[5] = { 4,8,0,3,5 };`
	`  int a = 3;`
	`  arr[a] = arr[2 * a - 4];`
	`  arr[a + 1] = 6;`
	`  arr[a - 1] = arr[a - 2];`
	`  cout << arr[1] << arr[2]`
	`  << arr[3] << arr[4];`
		8806
		
		Each digit(1.3 Marks)

	} 	

e.	int n = 0;
	while (n <= 11) {
	  if (n % 3 == 0)
	  {
	  cout << n << " ";
	  }
	  else
	  {
	  cout << "$" << endl;
	  }
	  n++;
	}
		0 $
		$
		3 $
		$
		6 $ 0.5 each line
		$
		9 $
		$

Left for Rough Work:

Q2	10 = 6 + 4

a. Write a C++ program that declares an array of size 100. Use named constant for the size of array. Take count of inputs that the user wants to enter. Input those many numbers from user. Then check if the provided elements of the array are the same or not if read from front or back. Your program must print "The elements are not equal" if any of the corresponding elements in the arrays are not equal otherwise it will print "The element read from both sides are equal".

For example, an array of size 100 with 6 valid elements input by the user that have the same elements (after reading it from front and back)

2	3	15	15	3	2											
0	1	2	3	4	5	6	7	8	9			...				99

```
#include<iostream>
using namespace std;

int main()
{
    const int SIZE_OF_ARRAY = 100;
    int arr[SIZE_OF_ARRAY] ;

    int count;
    cout << "Enter the count of inputs: " << endl;
    cin >> count;

    cout << "Enter the elements of the array" << endl;
    for (int i=0; i<count; i++)
    {
        cin >> arr[i];
    }
    int read = 1;
    int j = count-1;
    for(int i=0; i<count/2; i++)
    {
        if(arr[i]!=arr[j])
        {
            read=0;
            break;
        }
        else
            j--;
    }
    if (read==0)
        cout << "The elements are not equal" << endl;
    else
       cout << "The elements read from both sides are equal" <<
endl;
    return 0;
}
```

Commented [FFS1]: Marks: 1

Commented [FFS2]: Marks: 1

Commented [FFS3]: Marks: 1

Commented [FFS4]: Marks: 2

Commented [FFS5]: Marks: 1

b. Write a C++ program that

- Reads 10 integers in an array named “array1” (Marks: 1)
- Copy all the elements in another array named “array2” but in reverse order (Marks: 2)
- Then print all the elements of array2 (Marks: 1)

```
#include<iostream>
using namespace std;
int main()
{
    int array1[10], array2[10];

    cout << "Enter the elements of the array" << endl;
    for(int i=0;i<10;i++)
    {
        cin >> array1[i];
    }
    int j = 0;
    for(int i=9;i>=0;i--)
    {
        array2[i] = array1[j];
        j++;
    }

    cout << "The elemets in the reverse order are as follows" <<
endl;
    for(int i=0;i<10;i++)
    {
        cout << array2[i] << "\n";
    }
    return 0;
}
```

Commented [FFS6]: Marks: 1

Commented [FFS7]: Marks: 2

Commented [FFS8]: Marks: 1

Q3	10

Write a C++ program to the input set of integer values and count how many consecutive times each distinct value appears in the input. Stop the program when the user enters a zero value. Assume that the user will enter values in the range [0:99] only.
Program with the following input:
42 42 42 42 42 55 55 62 35 35 35 0
Output:
42 occurs 5 times
55 occurs 2 times
62 occurs 1 times
35 occurs 3 times

Solution: (Loops based solution was expected, as there was no word array in the question)
Rubrics are mentioned in parenthesis but it depends on Logic of the code!

```
#include<iostream>
using namespace std;
int main()
{
    int num=0, prev=0, count=1;

    cout<<"Enter a number, other than zero: ";
    cin>>num;
    prev = num; // your first num is previous                    (2)

    while(num != 0)                                              (2)
    {
        cout<<"Enter a number, other than zero: ";
        cin>>num;
        if(num == prev) //if new input == previous               (3)
            count++;
        else  // new input != previous then display its count    (3)
        {
            cout<<prev<<" occured "<<count<<" times"<<endl;
            count=1;
        }
        prev = num;  // store new number into previous for next iteration
    }

       return 0;
}
```

Q4	10

Write a program to add the first seven terms of the following series using a for loop:

$$Sum = 1/1! + 2/2! + 3/3! + 4/4! + \cdots$$

Output:

Enter the number of terms: 7

The Sum of the first 7 terms of the series is = 2.718056

Solution:

Rubrics are mentioned in parenthesis but it depends on Logic of the code!

```
#include<iostream>
using namespace std;
int main()
{
	int i;
	float fact=1, sum=0; (1)
	for(i=1;i<=7;i++)    (2)
	{
	    fact= fact*i;  //factorial of i (3)

	    sum += i/fact; //sum of series  (4)
	}


	cout<<"Sum of the series. = "<<sum<<endl;

	return 0;
}
```

OR

```
#include<iostream>
using namespace std;
int main()
{
	int i,j;
	float fact=1, sum=0;     (1)
	for(i=1;i<=7;i++)        (2)
	{
		fact= 1;
		for(j=1;j<=i;j++)  //factorial of i (3)
			fact=fact*j;

		sum += i/fact;  //sum of the series (4)
	}
	cout<<"Sum of the series. = "<<sum<<endl;

	return 0;
}
```