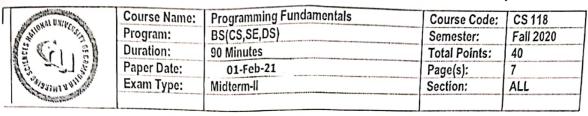
National University of Computer and Emerging Sciences, Lahore Campus



Registration No.	
MCBISH attoll No.	

Instructions:

Attempt all questions

You might use extra sheets for working but please try to write the final answer in the space provided for it

Problem No 1:

[2 + 4 + 2 + 4 Points]

What gets printed when each of the following code segmented is executed

Program Segment	Output
for(int num = 1; num<= 5; num++)	
cout< <num<<" "<<num*(num+1)="" 2<<end1;<="" td=""><td>-</td></num<<">	-
int main()	
(
int P[20];	
P[0] = 0;	
P[1] = 0;	
for(int $i = 2$; $i < 20$; $i++$)	
P[i] = i;	
for(int i = 2; i< 5; i++){	
for(int $j = 2*i$; (P[i] != 0) && (j< 20); j+=i)	
P[j] = 0;	
}	
for (int $i = 0$; $i < 20$; $i++$) {	* 100
if(P[i] != 0)	
<pre>cout<< P[i]<<endl;< pre=""></endl;<></pre>	
}	
return 0;	

```
int num = 10, i = 0;
    while(i < num)(
         if( i 12 == 0)
            cout<<1/2<<"-";
         else
            cout<<num-i/2-1<<"-";
        1++:
#include <iostream>
using namespace std;
int waitWhat(int& a, int& b) (
    int c = 0;
    a = c++;
    b = (a++) + c;
    return 2 * a + b;
}
int hellNo(int& a, int b, int& c) {
    c *= 2;
    int i = 0;
     for (i = 1; i <= c; i++) {
        a = a + c;
        c = c - 1;
    b = c + a;
    return i;
 int main() {
    int a = 1, b = 2, c, d;
    c = waitWhat(a, b);
    cout << "A: " << a << endl;
    cout << "B: " << b << endl;
    cout << "C: " << c << endl << endl;
    d = hellNo(a, c, b);
    cout << "A: " << a << endl;
    cout << "B: " << b << endl;
    cout << "C: " << c << endl;
    cout << "D: " << d << endl;
 return 0;
}
```

Problem No 2:

[12 Points]

Finding the position of larges and smallest values within a sequence a_0 , a_1 , ... a_{N-1} of N numbers is a useful operation.

Write a program that take as input a value N followed by reading N numbers and print the first occurrence of the smallest value and last occurrence of the largest value in the sequence.

NOTE: You are not allowed to use arrays for solving this problem. Furthermore, you must input the values only once

Following are some sample input along with the corresponding sample outputs

SAMPLE INPUT	SAMPLE OUTPUT
10	Smallest Value is at Position 0
1 2 3 4 5 6 7 8 9 10	Largest Value is at Position 9
6	Smallest Value is at Position 2
12.3 1 3 12 1	Largest Value is at Position 4
5	Smallest Value is at Position 0
2 2 2 2 2	Largest Value is at Position 4

WRITE THE PROGRAM ON THE NEXT PAGE

Problem No 3:

[12 + 4 Points]

A positive integer is said to be a SQUARE FREE if it is not divisible by any perfect square other than 1. Following are examples of some square free numbers 1, 2, 3, 5, 6, 7, 10, 11, 13, 14, 15, 17... whereas the numbers 4, 8, 9, 12... are not square free

- a. Write a function that will display all square free numbers that are less than N where N is a parameter of the function. The function must also return the count of these square free numbers to the calling function.
- b. Also write the main function that uses the function in part a) to display the square free numbers that are less than a certain value M specified by the user. The main function must also display the count of square-free numbers that are less than N and the count of non-square-free numbers that are less than N.

Following are some sample Inputs and the corresponding output that must be produced by your program

by your program		SAMPLE OUTPUT
	SAMPLE INPUT	SAIVIFEE OOT 5.
10		1, 2, 3, 5, 6, 7
10		Square Free Count = 6
		Non-Square Free Count= 3
		1, 2, 3, 5
6		Square Free Count = 4
		Non-Square Free Count= 1
		1, 2, 3
4		Square Free Count = 3
		Non-Square Free Count= 0
· · · · · · · · · · · · · · · · · · ·		

NOTE: YOU MIGHT WRITE ADITIONAL FUNCTION(s) IF NEEDED