

UNIVERSITY OF ENGINEERING AND TECHNOLOGY, TAXILA



SOFTWARE ENGINEERING

MID_SOLUTION

SUBMITTED TO : MS.SABA AWAN

SUBMITTED BY : MUHAMMAD ARSALAN

REG NO : 20-SE-56

+++++

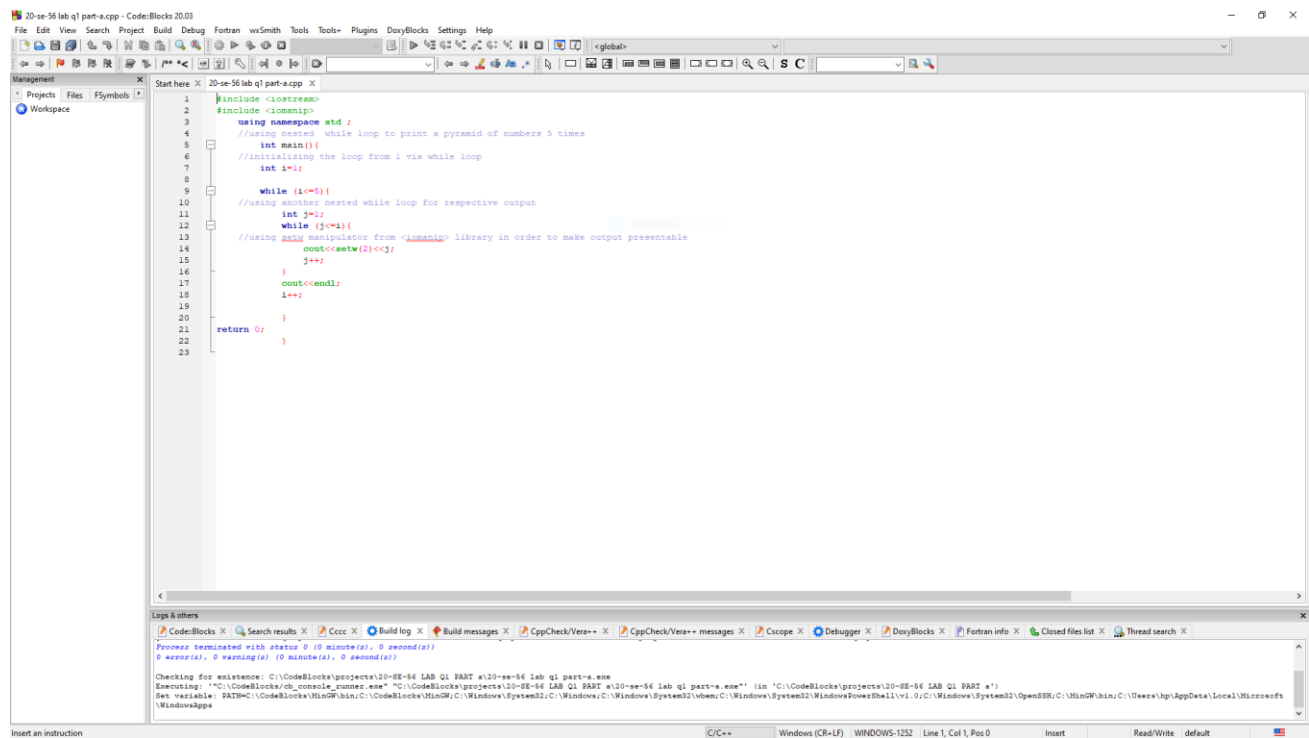
Question

a): Write C++ Program to Program to print half pyramid a using number and using alphabets by making use of “While Loop only”. [15 marks, CLO 1]

SOLUTION:

HALF-PYRAMID USING NUMBER

CODE:



```
1 #include <iostream>
2 #include <iomanip>
3 using namespace std;
4 //using nested while loop to print a pyramid of numbers 5 times
5 int main()
6 //initializing the loop from 1 via while loop
7 int i=1;
8
9 while (i<=5){
10 //using another nested while loop for respective output
11 int j=1;
12 while (j<=i){
13 //using setw manipulator from <iomanip> library in order to make output presentable
14 cout<<setw(2)<<j;
15 j++;
16 }
17 cout<<endl;
18 i++;
19 }
20
21 return 0;
22
23
```

Logs & others

Code::Blocks Search results X C++ Build log X Build messages X CppCheck/Ver++ X CppCheck/Ver++ messages X Cscope X Debugger X DoryBlocks X Fortran info X Closed files list X Thread search X

Process terminated with status 0 (0 minute(s), 0 second(s))
0 error(s), 0 warning(s), 0 minute(s), 0 second(s))

Checking for existence: C:\CodeBlocks\projects\20-SE-56 LAB Q1 PART a\20-se-56 lab q1 part-a.exe
Executing: "C:\CodeBlocks\cb_console_runner.exe" "C:\CodeBlocks\projects\20-SE-56 LAB Q1 PART a\20-se-56 lab q1 part-a.exe" (in "C:\CodeBlocks\projects\20-SE-56 LAB Q1 PART a")
Set variable: PATH=C:\CodeBlocks\MinGW\bin;C:\CodeBlocks\MinGW\bin\Windows\System32;C:\Windows\System32\cmd.exe;C:\Windows\System32\WindowsPowerShell\v1.0;C:\Windows\System32\OpenSSH\bin;C:\MinGW\bin;C:\Users\hp\AppData\Local\Microsoft\WindowsApps

Insert an instruction C/C++ Windows (CR+LF) WINDOWS-1252 Line 1, Col 1, Pos 0 Insert Read/Write default

Output

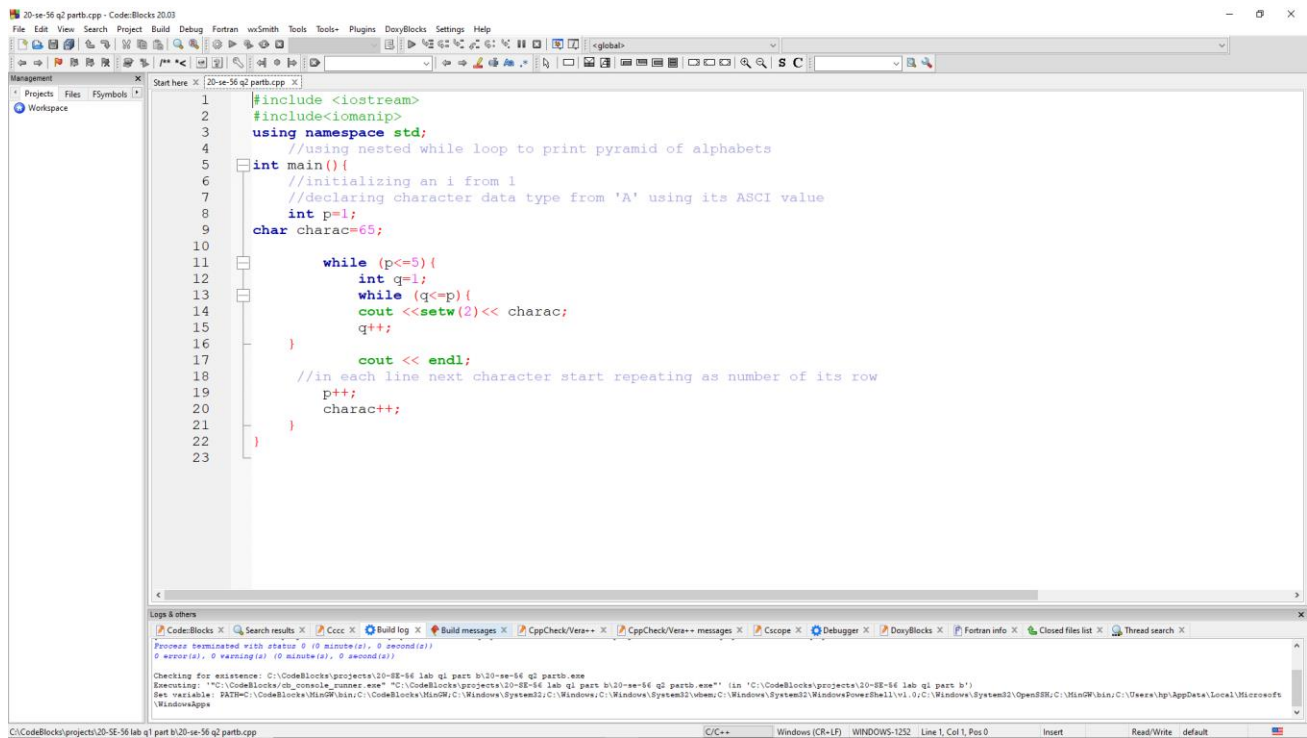


```
"C:\CodeBlocks\projects\20-SE-56 LAB Q1 PART a\20-se-56 lab q1 part-a.exe"
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

Process returned 0 (0x0)   execution time : 4.285 s
Press any key to continue.
```

HALF PYRAMID USINH ALPHABETS

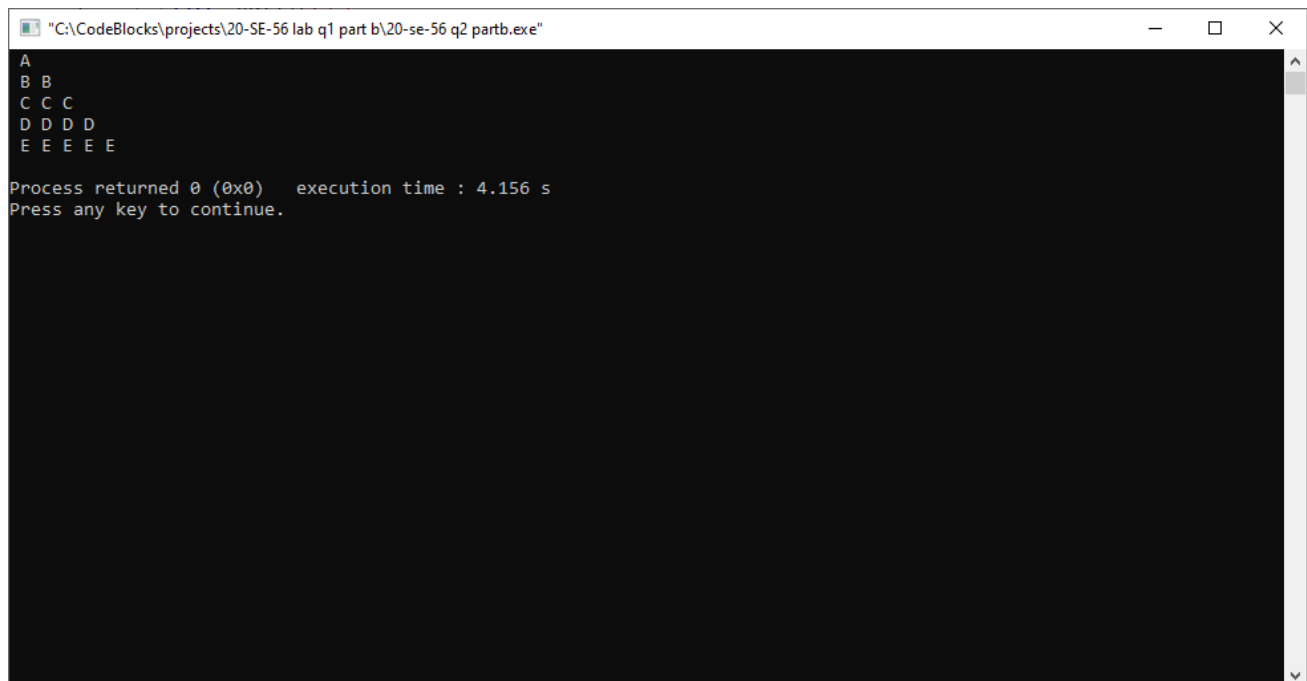
CODE:



```
1  #include <iostream>
2  #include <iomanip>
3  using namespace std;
4  //using nested while loop to print pyramid of alphabets
5  int main() {
6      //initializing an i from 1
7      //declaring character data type from 'A' using its ASCII value
8      int p=1;
9      char charac=65;
10
11      while (p<=5) {
12          int q=1;
13          while (q<=p) {
14              cout <<setw(2)<< charac;
15              q++;
16          }
17          cout << endl;
18          //in each line next character start repeating as number of its row
19          p++;
20          charac++;
21      }
22  }
```

The screenshot shows the Code::Blocks IDE with a C++ file named '20-se-56 q2 partb.cpp'. The code uses nested while loops to print a half pyramid of alphabets. The outer loop controls the number of rows (p from 1 to 5), and the inner loop controls the number of characters per row (q from 1 to p). The character starts at 'A' (ASCII 65) and increments by 1 for each character. The output is displayed in the 'Logs & others' panel at the bottom.

OUTPUT:



```
"C:\CodeBlocks\projects\20-SE-56 lab q1 part b\20-se-56 q2 partb.exe"
A
B B
C C C
D D D D
E E E E E

Process returned 0 (0x0)   execution time : 4.156 s
Press any key to continue.
```

The screenshot shows the execution of the program. The output is a half pyramid of alphabets: A, B B, C C C, D D D D, E E E E E. Below the output, it shows 'Process returned 0 (0x0)' and 'execution time : 4.156 s'. The prompt 'Press any key to continue.' is visible at the bottom.

QUESTION-1 PART-B

Write C++ Program to Program to print Program to print pyramid using numbers by making use of “**Nested for and While loop**”. [10 marks, CLO 1]

CODE:

```
20-se-56 q2.cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Plugins DoryBlocks Settings Help
C:\global\
Management
Projects Files Symbols
Workspace
1 //SIMPLE C++ PROGRAM IN ORDER TO PRINT PYRAMID
2 #include <iostream>
3 #include <iomanip>
4 using namespace std;
5
6 int main()
7 {
8     //INITIALIZING ALL REQUIRED VARIABLES
9     int rows;
10    //ROW COUNT WILL START FROM ZERO
11    count = 0;
12    count1 = 0;
13    m = 0;
14    //USER WILL PUT NUMBER OF ROWS HE WANTS TO DISPLAY OF TRIANGLE
15    cout << "NUMBER OF ROWS BEING PRINTED ";
16    cin >> rows;
17
18    for(int i = 1; i <= rows; ++i)
19        //USING NESTED FOR LOOP AND WHILE LOOP WITHIN FOR LOOP
20        {
21            for(int space = 1; space <= rows-i; ++space)
22            {
23                cout << " ";
24                ++count;
25            }
26
27            while(m != 2*i-1)
28            {
29                //WHILE LOOP COMPRISE OF IF-ELSE SEMANTIC
30                if (count <= rows-i)
31                {
32                    cout << setw(1) << i+m << " ";
33                    ++count;
34                }
35                else
36                {
37                    ++count1;
38                    cout << setw(1) << i-m-2*count1 << " ";
39                }
40                ++m;
41            }
42            //ALL THESE VARIABLES ARE EQUAL TO 0
43            count1 = count = m = 0;
44            cout << endl<<endl;
45
46            return 0;
47        }
48    }
49
50
```

OUTPUT:

```
"C:\CodeBlocks\projects\20-SE-56 lab q2\20-se-56 q2.exe"
NUMBER OF ROWS BEING PRINTED 5
1
2 3 2
3 4 5 4 3
4 5 6 7 6 5 4
5 6 7 8 9 8 7 6 5

Process returned 0 (0x0)   execution time : 23.195 s
Press any key to continue.
```

HAND WRITTEN SOLUTION OF EXAM

Muhammad Arsalan
20-SE-56

Mid-Term Exam

Question

Part-a

Half Pyramid Using number:

Code:-

```
#include <iostream>
#include <iomanip>

using namespace std;

int main() {
    int i=1;
    while (i<=5) {
        int j=1;
        while (j<=i) {
            cout << setw(2) << j;
            j++;
        }
        cout << endl;
        i++;
    }

    return 0;
}
```

Output :-

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

Half Pyramid Using alphabets:

Code:-

```
#include <iostream>
#include <iomanip>
using namespace std;
// using nested while loop to print pyramid of alphabet
int main() {
    // initializing an i from 1
    // declaring character data type from 'A' using ASCII value
    int p = 1;
    char charac = 'A';
    while (p <= 5) {
        int q = 1;
        while (q <= p) {
            cout << setw(2) << charac;
            q++;
        }
        cout << endl;
```

// in each line next character start repeating

p++;

charac ++;

}

}

Output

A

B B

C C C

D D D D

E E E E E

Part - b

Pyramid

Code:-

```
// Simple C++ Program to Print Pyramid
#include <iostream>
#include <iomanip>
using namespace std;
int main()
{
    // Initializing All Required Variables
    int rows,
    // Our Count Will Start from zero
    count = 0,
    count1 = 0,
    m = 0;
    // User Will Put Number of Rows
    cout << "NUMBER OF ROWS BEING PRINTED";
    cin >> rows;
    for (int i = 1; i <= rows; ++i)
    // Using Nested For loop and While loop
    {
        for (int space = 1; space <= rows - i; ++space)
        {
            cout << "  ";
            ++count;
        }
    }
```



```
while (m != 2 * i - 1)
```

```
{
```

```
// While loop Comprise of If-else
```

```
if (count <= rows - 1)
```

```
{
```

```
cout << setw(1) << i + m << " ";
```

```
++count;
```

```
}
```

```
else
```

```
{
```

```
++count1;
```

```
cout << setw(1) << i + m - 2 * count1 << " ";
```

```
}
```

```
++m;
```

```
}
```

```
// All these variables are equal to 0
```

```
count1 = count = m = 0;
```

```
cout << endl << endl;
```

```
}
```

```
return 0;
```

```
}
```

OutPut

```
      1
    2 3 2
  3 4 5 4 3
4 5 6 7 6 5 4
5 6 7 8 9 8 7 6 5
```