

Rollwala Computer Center

OBJECT ORIENTED CONCEPTS AND PROGRAMMING

Assignment-2

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Name: **Akshit Trivedi**

Roll No: **40**

Course: **Master of Computer Application**

Sem: **1**

OOCP ASSIGNMENT-2

Roll No: 40
Class: MCA-1

Name: Akshit Trivedi
Year: 2021-22

PATTERN PROGRAMS

1. Simple Number Triangle Pattern.

INPUT:

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

int main()
{
    int i,j,k,l,n;
    cout<<"Enter the Range=";
    cin>>n;

    for(i=1;i<=n;i++)
    {
        for(k=1;k<=i;k++)
        {
            cout<<i;

        }

        cout<<"\n";
    }

    return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 01_simple
e_pattern.cpp -o 01_simple_pattern } ; if ($?) { .\01_simple_pattern }
Enter the Range=5
1
22
333
4444
55555
```

2. Inverted Pyramid of Numbers.

INPUT:

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



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```
int main()
{
    int rows=6;

    int k=1;

    for(int i = rows; i >= 1; --i)
    {

        for(int j = 0; j < i-1; ++j)
        {
            cout << k<<" ";
        }

        k++;
        cout << endl;
    }
    return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 02_inverted_pyramid.cpp -o 02_inverted_pyramid } ; if ($?) { .\02_inverted_pyramid }
1 1 1 1 1
2 2 2 2
3 3 3
4 4
5
```

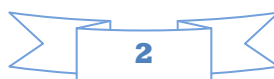
3. Half Pyramid Pattern of Numbers.

INPUT:

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

int main()
{
    int rows=5;

    for(int i=1; i<= rows; ++i)
    {
        for(int j=1; j<=i; ++j)
        {
```



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```
        cout<<j<< " ";
    }
    cout <<"\n";
}
return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 03_half_
pyramid.cpp -o 03_half_pyramid } ; if ($?) { .\03_half_pyramid }
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

4. Inverted Pyramid of Descending Numbers.

INPUT:

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

int main()
{
    int rows=5;

    for(int i = rows; i >= 1; --i)
    {

        for(int j = 0; j < i; ++j)
        {
            cout << i<<" ";
        }

        cout << endl;
    }

    return 0;
}
```

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OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 04_inverted_pyramid_of_desending_numbers.cpp -o 04_inverted_pyramid_of_desending_numbers } ; if ($?) { .\04_inverted_pyramid_of_desending_numbers }
5 5 5 5 5
4 4 4 4
3 3 3
2 2
1
```

5. Inverted Pyramid of the Same Digit.

INPUT:

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

int main()
{
    int rows=5;

    int num = 1;

    for (int i=5; i>=0; i--)
    {
        for(int j=0; j<=i; j++)
        {
            cout<<num;

        }

        printf("\n");

    }
    return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 05_inverted_pyramid_of_same_digit.cpp -o 05_inverted_pyramid_of_same_digit } ; if ($?) { .\05_inverted_pyramid_of_same_digit }
111111
11111
1111
111
11
1
1
```

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6. Reverse Pyramid of Numbers.

INPUT:

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

int main()
{
    int i,j,k,rows=5,count;

    for(i=1; i<=rows; i++)
    {
        for (int j=i; j>=1; j--)
        {
            cout<<j;
        }
        cout<<"\n";
    }
    return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 06_rever
ce_pyramid.cpp -o 06_reverce_pyramid } ; if ($?) { .\06_reverce_pyramid }
1
21
321
4321
54321
```

7. Inverted Half Pyramid Number Pattern.

INPUT:

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

int main()
{
    int rows;

    rows = 5;
```



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```
for(int i=5; i>=0; i--)
{
    for(int j=0; j<=i+1; j++)
    {
        cout<<j;
    }
    cout<<"\n";
}

return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 07_inverted_half_pyramid.cpp -o 07_inverted_half_pyramid } ; if ($?) { .\07_inverted_half_pyramid }
0123456
012345
01234
0123
012
01
~
```

8. Pyramid of Natural Numbers Less Than 10.

INPUT:

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

int main()
{
    int currentNumber = 1, stop = 2, rows=3;

    for(int i=0;i<rows; i++)
    {
        for(int j=1; j<stop; j++)
        {
            cout<<currentNumber <<" ";
            currentNumber++;
        }
        cout<<endl;
        stop +=2;
    }
}
```

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```
    return 0;  
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 08_pyram  
id_of_natural_number.cpp -o 08_pyramid_of_natural_number } ; if ($?) { .\08_pyramid_of_natural_number }  
1  
2 3 4  
5 6 7 8 9
```

9. Reverse Pattern of Digits from 10.

INPUT:

```
#include <iostream>  
using namespace std;  
int main()  
{  
    int start=1, currentNumber , stop = 2, rows;  
  
    currentNumber = stop;  
  
    for(int i=2;i<6; i++)  
    {  
        for(int j=start; j<stop; j++)  
        {  
            currentNumber=currentNumber-1;  
            cout<<currentNumber <<" ";  
  
        }  
        cout<<endl;  
  
        start=stop;  
  
        stop +=i;  
  
        currentNumber=stop;  
    }  
  
    return 0;  
}
```


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OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 09_rever  
ce_pattarn.cpp -o 09_reverce_pattarn } ; if ($?) { .\09_reverce_pattarn }  
1  
3 2  
6 5 4  
10 9 8 7
```

10. Unique Pyramid Pattern of Digits.

INPUT:

```
#include <iostream>  
using namespace std;  
int main()  
{  
    int rows=6;  
  
    for(int i=1; i<=rows; i++)  
    {  
        for(int j=1; j<i-1; j++)  
        {  
            cout<<j<<" ";  
        }  
        for(int j=i-1; j>0; j--)  
        {  
            cout<<j<<" ";  
        }  
        cout<<endl;  
    }  
  
    return 0;  
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 10_uniqu  
e_pyramid.cpp -o 10_unique_pyramid } ; if ($?) { .\10_unique_pyramid }  
1  
1 2 1  
1 2 3 2 1  
1 2 3 4 3 2 1  
1 2 3 4 5 4 3 2 1
```

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11. Connected Inverted Pyramid Pattern of Numbers.

INPUT:

```
#include <iostream>
using namespace std;
int main()
{
    int rows = 6;

    for(int i=0; i<=rows; i++)
    {
        for(int j=rows-1; j>i; j--)
        {
            cout<<j<<" ";
        }
        for(int l=0; l<i; l++)
        {
            cout<<" ";
        }
        for(int k=i+1; k<rows; k++)
        {
            cout<<k<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 11_inver
t_pyramid.cpp -o 11_invert_pyramid } ; if ($?) { .\11_invert_pyramid }
5432112345
54322345
543345
5445
55
```

12. Even Number Pyramid Pattern.

INPUT:

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

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```
int main()
{
    int rows = 5;
    int LastEvenNumber = 2 * rows;
    int evenNumber = LastEvenNumber;

    for(int i=1; i<=rows; i++)
    {
        evenNumber = LastEvenNumber;

        for(int j=0; j<i; j++)
        {
            cout<<evenNumber<<" ";

            evenNumber -= 2;
        }
        cout<<endl;
    }
    return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ tempCode
RunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
10
10 8
10 8 6
10 8 6 4
10 8 6 4 2
```

13. Pyramid of Horizontal Tables.

INPUT:

```
#include<iostream>

using namespace std;
int main()
{
    int rows = 6;

    for(int i=0; i<=rows; i++)
    {
```

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```
        for(int j=0; j<=i; j++)
        {
            cout<< i*j ;
        }
        cout<<endl;
    }
    return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 13_Horiz
ontal_tables.cpp -o 13_Horizontal_tables } ; if ($?) { .\13_Horizontal_tables }
0
01
024
0369
0481216
0510152025
061218243036
```

14. Pyramid Pattern of Alternate Numbers.

INPUT:

```
#include<iostream>

using namespace std;
int main()
{
    int rows = 5;

    for(int i=1; i<=rows; i++)
    {
        for(int j=1; j<=i; j++)
        {
            cout<< i*2-1 ;
        }
        cout<<endl;
    }
    return 0;
}
```

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OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 14_Pyramid_Alternate.cpp -o 14_Pyramid_Alternate } ; if ($?) { .\14_Pyramid_Alternate }
1
33
555
7777
99999
```

15. Mirrored Pyramid (Right-angled Triangle) Pattern of Numbers.

INPUT:

```
#include<iostream>

using namespace std;
int main()
{
    int rows = 5;

    for(int i=1; i<=rows; i++)
    {
        int num=1;
        for(int j=rows; j>0; j--)
        {
            if(j > i)
            {
                cout<<" ";
            }
            else
            {
                cout<<num;
                num+=1;
            }
        }
        cout<<endl;
    }
    return 0;
}
```

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OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 15_Mirrored_Pyramid.cpp -o 15_Mirrored_Pyramid } ; if ($?) { .\15_Mirrored_Pyramid }
1
12
123
1234
12345
```

16. Equilateral Triangle with Stars (Asterisk Symbol).

INPUT:

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

int main()
{
    int i, j, rows;

    cout<<"Enter Number of rows : ";
    cin>>rows;

    for(i=1; i<=rows; i++)
    {
        for(j=i; j<rows; j++)
        {
            cout<<" ";
        }

        for(j=1; j<=(2*i-1); j++)
        {
            cout<<"*";
        }

        cout<<"\n";
    }
    return 0;
}
```

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OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ 16_Equilateral_Triangle.cpp -o 16_Equilateral_Triangle } ; if ($?) { .\16_Equilateral_Triangle }
Enter Number of rows : 5
*
***
*****
*****
*****
*****
```

17. Downward Triangle Pattern of Stars.

INPUT:

```
#include<iostream>
using namespace std;
int main()
{
    int i, space, j, rows;
    cout<<"Enter Number of Rows: ";
    cin>>rows;
    for(i=1; i<=rows; i++)
    {
        for(space=1; space<i; space++)
            cout<<" ";
        for(j=i; j<=rows; j++)
        {
            cout<<"* ";
        }
        cout<<endl;
    }
    cout<<endl;
    return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter Number of Rows: 5
* * * * *
* * *
* *
*
*
```

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18. Pyramid Pattern of Stars.

INPUT:

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

int main()
{
    int space, rows;

    cout << "Enter number of rows: ";
    cin >> rows;

    for(int i = 1, k = 0; i <= rows; ++i, k = 0)
    {
        for(space = 1; space <= rows-i; ++space)
        {
            cout << " ";
        }

        while(k != 2*i-1)
        {
            cout << "* ";
            k++;
        }
        cout << endl;
    }
    return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter number of rows: 5
```

```

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


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19. Hourglass Pattern Program.

INPUT:

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

void pattern(int rows_no)
{
    int i, j, k;

    for (i = 1; i <= rows_no; i++) {

        for (k = 1; k < i; k++)
            cout << " ";

        for (j = i; j <= rows_no; j++)
            cout << j << " ";

        cout << endl;
    }

    for (i = rows_no - 1; i >= 1; i--) {

        for (k = 1; k < i; k++)
            cout << " ";

        for (j = i; j <= rows_no; j++)
            cout << j << " ";

        cout << endl;
    }
}

int main()
{
    int rows_no;
    cout<<"Enter Number of Rows: ";
    cin>>rows_no;

    pattern(rows_no);
    return 0;
}
```

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}

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter Number of Rows: 5
1 2 3 4 5
 2 3 4 5
   3 4 5
    4 5
     5
    4 5
   3 4 5
  2 3 4 5
 1 2 3 4 5
```

20. Pascal's Triangle Program.

INPUT:

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

int main()
{
    int rows, count = 0, count1 = 0, k = 0;

    cout << "Enter number of rows: ";
    cin >> rows;

    for(int i = 1; i <= rows; ++i)
    {
        for(int space = 1; space <= rows-i; ++space)
        {
            cout << " ";
            count++;
        }

        while(k != 2*i-1)
        {
            if (count <= rows-1)
            {
                cout << i+k << " ";
                count++;
            }
            else

```

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```
        {
            count1++;
            cout << i+k-2*count1 << " ";
        }
        k++;
    }
    count1 = count = k = 0;

    cout << endl;
}
return 0;
}
```

OUTPUT:

```
PS C:\MCA\MCA-1\OOCP\Practical Assignment 2> cd "c:\MCA\MCA-1\OOCP\Practical Assignment 2\" ; if ($?) { g++ tempCode
RunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter number of rows: 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
```