

Pattern Programs in Java

Nested Loop

Practice for Class 9/10 ICSE

1. Star Triangle Pattern

Pattern

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

Answer

```
class StarPattern1  
{  
    public static void main(String args[])  
    {  
        for(int i=1;i<=5;i++)  
        {  
            for(int j=1;j<=i;j++)  
            {  
                System.out.print("*");  
            }  
  
            System.out.println();  
        }  
    }  
}
```

Explanation

- Outer loop controls rows.
- Inner loop prints stars.

2. Reverse Star Pattern

Pattern

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

Answer

```
class StarPattern2  
{  
    public static void main(String args[])  
    {  
        for(int i=5;i>=1;i--)  
        {  
            for(int j=1;j<=i;j++)  
            {  
                System.out.print("*");  
            }  
  
            System.out.println();  
        }  
    }  
}
```

```
        System.out.print("*");
    }

    System.out.println();
}
}
```

3. Number Triangle Pattern

1
12
123
1234
12345

Answer

```
class NumberPattern1
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=i;j++)
            {
                System.out.print(j);
            }

            System.out.println();
        }
    }
}
```

4. Reverse Number Pattern

12345
1234
123
12
1

Answer

```
class NumberPattern2
{
    public static void main(String args[])
    {
        for(int i=5;i>=1;i--)
        {
            for(int j=1;j<=i;j++)
            {
                System.out.print(j);
            }

            System.out.println();
        }
    }
}
```

5. Alphabet Triangle Pattern

Pattern

A
AB
ABC
ABCD
ABCDE

Answer

```
class AlphabetPattern1
{
    public static void main(String args[])
    {
        for(char i='A'; i<='E'; i++)
        {
            for(char j='A'; j<=i; j++)
            {
                System.out.print(j);
            }

            System.out.println();
        }
    }
}
```

6. Reverse Alphabet Pattern

Pattern

ABCDE
ABCD
ABC
AB
A

Answer

```
class AlphabetPattern2
{
    public static void main(String args[])
    {
        for(char i='E'; i>='A'; i--)
        {
            for(char j='A'; j<=i; j++)
            {
                System.out.print(j);
            }

            System.out.println();
        }
    }
}
```

7. Floyd's Triangle

Pattern

```
1
2 3
4 5 6
7 8 9 10
```

Answer

```
class FloydTriangle
{
    public static void main(String args[])
    {
        int k=1;

        for(int i=1;i<=4;i++)
        {
            for(int j=1;j<=i;j++)
            {
                System.out.print(k + " ");
                k++;
            }

            System.out.println();
        }
    }
}
```

8. Binary Pattern

Pattern

```
1
01
101
0101
```

Answer

```
class BinaryPattern
{
    public static void main(String args[])
    {
        for(int i=1;i<=4;i++)
        {
            for(int j=1;j<=i;j++)
            {
                System.out.print((i+j)%2);
            }

            System.out.println();
        }
    }
}
```

9. Square Star Pattern



Pattern

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

Answer

```
class SquarePattern
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=5;j++)
            {
                System.out.print("*");
            }

            System.out.println();
        }
    }
}
```

10. Hollow Square Pattern

Pattern

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

Answer

```
class HollowSquare
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=5;j++)
            {
                if(i==1 || i==5 || j==1 || j==5)
                    System.out.print("*");
                else
                    System.out.print(" ");
            }

            System.out.println();
        }
    }
}
```

11. Right Angle Number Pattern

Pattern

1
22
333
4444
55555

Answer

```
class NumberPattern3
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=i;j++)
            {
                System.out.print(i);
            }

            System.out.println();
        }
    }
}
```

12. Reverse Right Angle Number Pattern

55555
4444
333
22
1

Answer

```
class NumberPattern4
{
    public static void main(String args[])
    {
        for(int i=5;i>=1;i--)
        {
            for(int j=1;j<=i;j++)
            {
                System.out.print(i);
            }

            System.out.println();
        }
    }
}
```

13. Pyramid Star Pattern

*


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

Answer

```
class PyramidPattern
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=5-i;j++)
            {
                System.out.print(" ");
            }

            for(int k=1;k<=2*i-1;k++)
            {
                System.out.print("*");
            }

            System.out.println();
        }
    }
}
```

14. Inverted Pyramid Pattern

Pattern

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

Answer

```
class InvertedPyramid
{
    public static void main(String args[])
    {
        for(int i=5;i>=1;i--)
        {
            for(int j=1;j<=5-i;j++)
            {
                System.out.print(" ");
            }

            for(int k=1;k<=2*i-1;k++)
            {
                System.out.print("*");
            }

            System.out.println();
        }
    }
}
```

15. Hollow Triangle Pattern

Pattern

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

Answer

```
class HollowTriangle
{
    public static void main(String args[])
    {
        int n=5;

        for(int i=1;i<=n;i++)
        {
            for(int j=1;j<=i;j++)
            {
                if(j==1 || j==i || i==n)
                    System.out.print("*");
                else
                    System.out.print(" ");
            }

            System.out.println();
        }
    }
}
```

16. Continuous Number Square Pattern

Pattern

```
12345
12345
12345
12345
12345
```

Answer

```
class Pattern16
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=5;j++)
            {
                System.out.print(j);
            }

            System.out.println();
        }
    }
}
```

```
}  
}
```

17. Alphabet Square Pattern

Pattern

```
ABCDE  
ABCDE  
ABCDE  
ABCDE  
ABCDE
```

Answer

```
class Pattern17  
{  
    public static void main(String args[])  
    {  
        for(int i=1;i<=5;i++)  
        {  
            for(char j='A';j<='E';j++)  
            {  
                System.out.print(j);  
            }  
  
            System.out.println();  
        }  
    }  
}
```

18. Reverse Counting Pattern

Pattern

```
54321  
5432  
543  
54  
5
```

Answer

```
class Pattern18  
{  
    public static void main(String args[])  
    {  
        for(int i=5;i>=1;i--)  
        {  
            for(int j=5;j>=6-i;j--)  
            {  
                System.out.print(j);  
            }  
  
            System.out.println();  
        }  
    }  
}
```

19. Alternate 1 and 0 Pattern

Pattern

```
10101
01010
10101
01010
10101
```

Answer

```
class Pattern19
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=5;j++)
            {
                System.out.print((i+j+1)%2);
            }

            System.out.println();
        }
    }
}
```

20. Reverse Alphabet Triangle

Pattern

```
E
DE
CDE
BCDE
ABCDE
```

Answer

```
class Pattern20
{
    public static void main(String args[])
    {
        for(char i='E'; i>='A'; i--)
        {
            for(char j=i; j<='E'; j++)
            {
                System.out.print(j);
            }

            System.out.println();
        }
    }
}
```

21. Multiplication Table Pattern

Pattern

```
1 2 3
2 4 6
3 6 9
```

Answer

```
class Pattern21
{
    public static void main(String args[])
    {
        for(int i=1;i<=3;i++)
        {
            for(int j=1;j<=3;j++)
            {
                System.out.print((i*j) + " ");
            }

            System.out.println();
        }
    }
}
```

22. Diagonal Star Pattern

```
*
 *
  *
   *
```

Answer

```
class Pattern22
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<i;j++)
            {
                System.out.print(" ");
            }

            System.out.println("*");
        }
    }
}
```

23. X Pattern

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

Answer

```
class Pattern23
{
    public static void main(String args[])
    {
        int n=5;

        for(int i=1;i<=n;i++)
        {
            for(int j=1;j<=n;j++)
            {
                if(i==j || i+j==n+1)
                    System.out.print("*");
                else
                    System.out.print(" ");
            }

            System.out.println();
        }
    }
}
```

24. Hollow Rectangle Pattern

Pattern

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

Answer

```
class Pattern24
{
    public static void main(String args[])
    {
        int rows=4, cols=6;

        for(int i=1;i<=rows;i++)
        {
            for(int j=1;j<=cols;j++)
            {
                if(i==1 || i==rows || j==1 || j==cols)
                    System.out.print("*");
                else
                    System.out.print(" ");
            }

            System.out.println();
        }
    }
}
```

25. Increasing Alphabet Pattern

Pattern

```
A
BB
```

CCC
DDDD
EEEE

Answer

```
class Pattern25
{
    public static void main(String args[])
    {
        for(char i='A'; i<='E'; i++)
        {
            for(char j='A'; j<=i; j++)
            {
                System.out.print(i);
            }

            System.out.println();
        }
    }
}
```

26. Continuous Character Pattern

A
BC
DEF
GHIJ
KLMNO

Answer

```
class Pattern26
{
    public static void main(String args[])
    {
        char ch='A';

        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=i;j++)
            {
                System.out.print(ch);
                ch++;
            }

            System.out.println();
        }
    }
}
```

27. Reverse Continuous Number Pattern

Pattern

98765
9876
987

98
9

Answer

```
class Pattern27
{
    public static void main(String args[])
    {
        for(int i=5;i>=1;i--)
        {
            for(int j=9;j>=10-i;j--)
            {
                System.out.print(j);
            }

            System.out.println();
        }
    }
}
```

28. Centered Number Pyramid Pattern

```
1
121
12321
1234321
123454321
```

Answer

```
class Pattern28
{
    public static void main(String args[])
    {
        int n=5;

        for(int i=1;i<=n;i++)
        {
            for(int j=1;j<=n-i;j++)
            {
                System.out.print(" ");
            }

            for(int j=1;j<=i;j++)
            {
                System.out.print(j);
            }

            for(int j=i-1;j>=1;j--)
            {
                System.out.print(j);
            }

            System.out.println();
        }
    }
}
```

29. Diamond Star Pattern

Pattern

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

Answer

```
class Pattern29
{
    public static void main(String args[])
    {
        for(int i=1;i<=4;i++)
        {
            for(int j=1;j<=4-i;j++)
                System.out.print(" ");

            for(int k=1;k<=2*i-1;k++)
                System.out.print("*");

            System.out.println();
        }

        for(int i=3;i>=1;i--)
        {
            for(int j=1;j<=4-i;j++)
                System.out.print(" ");

            for(int k=1;k<=2*i-1;k++)
                System.out.print("*");

            System.out.println();
        }
    }
}
```

30. Pascal Triangle Pattern

Pattern

```
1
1 1
1 2 1
1 3 3 1
```

Answer

```
class Pattern30
{
    public static void main(String args[])
    {
        int n=4;

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

```

        int num=1;

        for(int j=0;j<=i;j++)
        {
            System.out.print(num + " ");

            num = num * (i-j) / (j+1);
        }

        System.out.println();
    }
}

```

Important Tips for Students

Common Nested Loop Logic

Pattern Type	Common Formula
Triangle	$j \leq i$
Reverse Triangle	$j \leq n - i$
Pyramid	$2 * i - 1$
Hollow Shape	Border condition
Binary Pattern	$(i + j) \% 2$
Alphabet Pattern	Character increment

Most Important Patterns for ICSE Practical

- ✓ Floyd Triangle
- ✓ Pyramid Pattern
- ✓ Diamond Pattern
- ✓ Hollow Square
- ✓ Number Triangle
- ✓ Binary Pattern
- ✓ Alphabet Triangle
- ✓ Pascal Triangle
- ✓ X Pattern
- ✓ Continuous Character Pattern



Some more patterns like diagonals, boundaries, right angle inverted right angle Mirror image of all those patterns

Advanced Pattern Programs in Java

Diagonal, Boundary, Mirror & Right Angle Patterns

Class 9/10 ICSE – Nested Loop Practice

31. Left Diagonal Star Pattern

Pattern

```
*
 *
  *
   *
    *
```

Answer

```
class Pattern31
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<i;j++)
            {
                System.out.print(" ");
            }

            System.out.println("*");
        }
    }
}
```

32. Right Diagonal Star Pattern

Pattern

```
*
 *
  *
   *
    *
```

Answer

```
class Pattern32
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=5-i;j++)
            {
                System.out.print(" ");
            }

            System.out.println("*");
        }
    }
}
```

33. Cross (X) Pattern

Pattern

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

```
* *  
* *
```

Answer

```
class Pattern33  
{  
    public static void main(String args[])  
    {  
        int n=5;  
  
        for(int i=1;i<=n;i++)  
        {  
            for(int j=1;j<=n;j++)  
            {  
                if(i==j || i+j==n+1)  
                    System.out.print("*");  
                else  
                    System.out.print(" ");  
            }  
  
            System.out.println();  
        }  
    }  
}
```

34. Hollow Square Boundary Pattern

Pattern

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

Answer

```
class Pattern34  
{  
    public static void main(String args[])  
    {  
        int n=5;  
  
        for(int i=1;i<=n;i++)  
        {  
            for(int j=1;j<=n;j++)  
            {  
                if(i==1 || i==n || j==1 || j==n)  
                    System.out.print("*");  
                else  
                    System.out.print(" ");  
            }  
  
            System.out.println();  
        }  
    }  
}
```

35. Hollow Rectangle Boundary Pattern

Pattern

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

Answer

```
class Pattern35
{
    public static void main(String args[])
    {
        int row=4, col=6;

        for(int i=1;i<=row;i++)
        {
            for(int j=1;j<=col;j++)
            {
                if(i==1 || i==row || j==1 || j==col)
                    System.out.print("*");
                else
                    System.out.print(" ");
            }

            System.out.println();
        }
    }
}
```

36. Right Angle Triangle Pattern

Pattern

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

Answer

```
class Pattern36
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=i;j++)
            {
                System.out.print("*");
            }

            System.out.println();
        }
    }
}
```

37. Inverted Right Angle Triangle

Pattern

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

Answer

```
class Pattern37  
{  
    public static void main(String args[])  
    {  
        for(int i=5;i>=1;i--)  
        {  
            for(int j=1;j<=i;j++)  
            {  
                System.out.print("*");  
            }  
  
            System.out.println();  
        }  
    }  
}
```

38. Mirror Right Triangle Pattern

Pattern

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

Answer

```
class Pattern38  
{  
    public static void main(String args[])  
    {  
        for(int i=1;i<=5;i++)  
        {  
            for(int j=1;j<=5-i;j++)  
            {  
                System.out.print(" ");  
            }  
  
            for(int k=1;k<=i;k++)  
            {  
                System.out.print("*");  
            }  
  
            System.out.println();  
        }  
    }  
}
```

39. Inverted Mirror Right Triangle

Pattern

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

Answer

```
class Pattern39
{
    public static void main(String args[])
    {
        for(int i=5;i>=1;i--)
        {
            for(int j=1;j<=5-i;j++)
            {
                System.out.print(" ");
            }

            for(int k=1;k<=i;k++)
            {
                System.out.print("*");
            }

            System.out.println();
        }
    }
}
```

40. Hollow Right Triangle

Pattern

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

Answer

```
class Pattern40
{
    public static void main(String args[])
    {
        int n=5;

        for(int i=1;i<=n;i++)
        {
            for(int j=1;j<=i;j++)
            {
                if(j==1 || j==i || i==n)
                    System.out.print("*");
                else
                    System.out.print(" ");
            }
        }
    }
}
```

```
    }  
    System.out.println();  
    }  
}
```

41. Hollow Inverted Triangle Pattern

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

Answer

```
class Pattern41  
{  
    public static void main(String args[])  
    {  
        int n=5;  
  
        for(int i=n;i>=1;i--)  
        {  
            for(int j=1;j<=i;j++)  
            {  
                if(j==1 || j==i || i==n)  
                    System.out.print("*");  
                else  
                    System.out.print(" ");  
            }  
  
            System.out.println();  
        }  
    }  
}
```

42. Plus (+) Pattern

Pattern

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

Answer

```
class Pattern42  
{  
    public static void main(String args[])  
    {  
        int n=5;  
  
        for(int i=1;i<=n;i++)  
        {
```

```

        for(int j=1;j<=n;j++)
        {
            if(i==3 || j==3)
                System.out.print("*");
            else
                System.out.print(" ");
        }

        System.out.println();
    }
}

```

43. Boundary Number Square

Pattern

```

11111
1  1
1  1
1  1
11111

```

Answer

```

class Pattern43
{
    public static void main(String args[])
    {
        int n=5;

        for(int i=1;i<=n;i++)
        {
            for(int j=1;j<=n;j++)
            {
                if(i==1 || i==n || j==1 || j==n)
                    System.out.print("1");
                else
                    System.out.print(" ");
            }

            System.out.println();
        }
    }
}

```

44. Double Side Triangle Pattern

Pattern

```

*      *
**     **
***    ***
****   ****
*****

```

Answer

```

class Pattern44
{

```

```

public static void main(String args[])
{
    int n=5;

    for(int i=1;i<=n;i++)
    {
        for(int j=1;j<=i;j++)
            System.out.print("*");

        for(int j=1;j<=2*(n-i);j++)
            System.out.print(" ");

        for(int j=1;j<=i;j++)
            System.out.print("*");

        System.out.println();
    }
}

```

45. Sandglass Pattern

```

*****
***
*
***
*****

```

Answer

```

class Pattern45
{
    public static void main(String args[])
    {
        for(int i=3;i>=1;i--)
        {
            for(int j=1;j<=3-i;j++)
                System.out.print(" ");

            for(int k=1;k<=2*i-1;k++)
                System.out.print("*");

            System.out.println();
        }

        for(int i=2;i<=3;i++)
        {
            for(int j=1;j<=3-i;j++)
                System.out.print(" ");

            for(int k=1;k<=2*i-1;k++)
                System.out.print("*");

            System.out.println();
        }
    }
}

```

46. Butterfly Pattern

Pattern

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

Answer

```
class Pattern46
{
    public static void main(String args[])
    {
        int n=4;

        for(int i=1;i<=n;i++)
        {
            for(int j=1;j<=i;j++)
                System.out.print("*");

            for(int j=1;j<=2*(n-i);j++)
                System.out.print(" ");

            for(int j=1;j<=i;j++)
                System.out.print("*");

            System.out.println();
        }

        for(int i=n-1;i>=1;i--)
        {
            for(int j=1;j<=i;j++)
                System.out.print("*");

            for(int j=1;j<=2*(n-i);j++)
                System.out.print(" ");

            for(int j=1;j<=i;j++)
                System.out.print("*");

            System.out.println();
        }
    }
}
```

47. Hollow Diamond Pattern

Pattern

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

Answer

```
class Pattern47
{
    public static void main(String args[])
    {
        int n=4;

        for(int i=1;i<=n;i++)
        {
            for(int j=1;j<=n-i;j++)
                System.out.print(" ");

            for(int j=1;j<=2*i-1;j++)
            {
                if(j==1 || j==2*i-1)
                    System.out.print("*");
                else
                    System.out.print(" ");
            }

            System.out.println();
        }

        for(int i=n-1;i>=1;i--)
        {
            for(int j=1;j<=n-i;j++)
                System.out.print(" ");

            for(int j=1;j<=2*i-1;j++)
            {
                if(j==1 || j==2*i-1)
                    System.out.print("*");
                else
                    System.out.print(" ");
            }

            System.out.println();
        }
    }
}
```

48. Zig-Zag Number Pattern

```
1
21
121
2121
12121
```

Answer

```
class Pattern48
{
    public static void main(String args[])
    {
        for(int i=1;i<=5;i++)
        {
```

```

        for(int j=1;j<=i;j++)
        {
            if((i+j)%2==0)
                System.out.print("1");
            else
                System.out.print("2");
        }

        System.out.println();
    }
}

```

49. Hollow Pyramid Pattern

```

  *
 * *
*   *
*     *
*****

```

Answer

```

class Pattern49
{
    public static void main(String args[])
    {
        int n=5;

        for(int i=1;i<=n;i++)
        {
            for(int j=1;j<=n-i;j++)
                System.out.print(" ");

            for(int j=1;j<=2*i-1;j++)
            {
                if(j==1 || j==2*i-1 || i==n)
                    System.out.print("*");
                else
                    System.out.print(" ");
            }

            System.out.println();
        }
    }
}

```

50. Hourglass Pattern

```

*****
*****
*****
***
*
***
*****

```

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

Answer

```
class Pattern50
{
    public static void main(String args[])
    {
        int n=5;

        for(int i=n;i>=1;i--)
        {
            for(int j=1;j<=n-i;j++)
                System.out.print(" ");

            for(int k=1;k<=2*i-1;k++)
                System.out.print("*");

            System.out.println();
        }

        for(int i=2;i<=n;i++)
        {
            for(int j=1;j<=n-i;j++)
                System.out.print(" ");

            for(int k=1;k<=2*i-1;k++)
                System.out.print("*");

            System.out.println();
        }
    }
}
```

51. Checkerboard Pattern

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

Answer

```
class Pattern51
{
    public static void main(String args[])
    {
        for(int i=1;i<=4;i++)
        {
            for(int j=1;j<=4;j++)
            {
                if((i+j)%2==0)
                    System.out.print("* ");
                else
                    System.out.print(" *");
            }

            System.out.println();
        }
    }
}
```

```
}  
}  
}
```

Important Tips for Pattern Programs

Outer Loop

Controls:

- Number of rows

Inner Loop

Controls:

- Number of columns
- Stars
- Numbers
- Alphabets

Common Logic Used

Purpose	Logic
Increasing pattern	$j \leq i$
Decreasing pattern	$j \leq n - i$
Spaces	$n - i$
Pyramid	$2 * i - 1$

Most Important Patterns for ICSE

1. Star Triangle
2. Floyd Triangle
3. Number Triangle
4. Pyramid Pattern
5. Hollow Square
6. Alphabet Triangle
7. Binary Pattern
8. Reverse Triangle

These are frequently asked in:

- School Exams
- Practical Exams
- Viva Questions
- Logic Building Programs

Important Logic Used in Patterns

Pattern Type	Main Logic
Diagonal	$i == j$
Opposite Diagonal	$i + j == n + 1$
Hollow Shape	Boundary condition
Mirror Triangle	Spaces + Stars

Pattern Type	Main Logic
Pyramid	$2*i-1$
Inverted Triangle	Reverse outer loop

Most Important ICSE Pattern Programs

- ✓ Hollow Square
- ✓ Mirror Triangle
- ✓ Pyramid
- ✓ X Pattern
- ✓ Diagonal Pattern
- ✓ Boundary Pattern
- ✓ Right Angle Triangle
- ✓ Inverted Triangle
- ✓ Diamond Pattern
- ✓ Plus Pattern

Important Special Shapes Covered

- ✓ Butterfly Pattern
- ✓ Hollow Diamond
- ✓ Zig-Zag Pattern
- ✓ Hollow Pyramid
- ✓ Hourglass Pattern
- ✓ Checkerboard Pattern

These patterns are excellent for:

- Nested Loop Mastery
- ICSE Practical Exams
- Logic Building
- Viva Preparation
- Advanced Java Pattern Questions
