

2022

MARCH

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
27	28	29	30	31								

M	T	W	T	F	S	S	M	T	W	T	F	S
---	---	---	---	---	---	---	---	---	---	---	---	---

01

March

10th Wk • 060-305

Tuesday

01/04/24

Conditional Statement

✓ if (condition)

{ statement;

} else if (condition)

{ statement;

}

else { statement;

}

{ } is required to execute multiple statements.

✓ switch ()

break;

E.g → int button = sc.nextInt();

switch (button)

{ case 1 :

System.out.println ("namaste");

break;

case 2 :

System.out.println ("hello");

break;

default :

System.out.println ("invalid");

break;

APRIL
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24
25 26 27 28 29 30
M T W T F S S M T W T F S S

For characters,

case 'a':

 statement;

 break;

case 'b':

 statement;

 break;

* * break → keyword of java that takes control out of the scope. As soon as user encounters break, rest of the statement doesn't get executed.

Loops in Java

1) for loop → for (initialization, condition; update)

{ statement;

2) while loop

}

3) do-while loop

while (condition)

{ statement;

do

{ statement;

}

} while (condition); → use terminator.

03

March

10th Wk • 062-303

Thursday

outer loop
inner loop

2022

65

MARCH

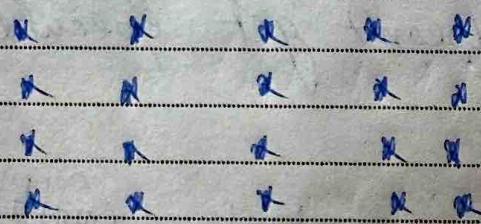
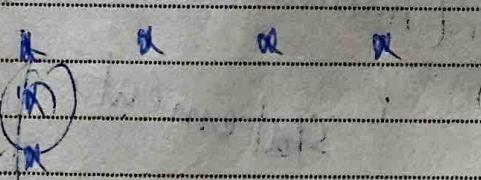
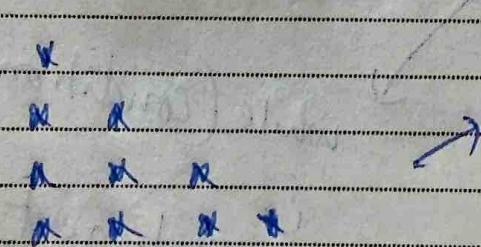
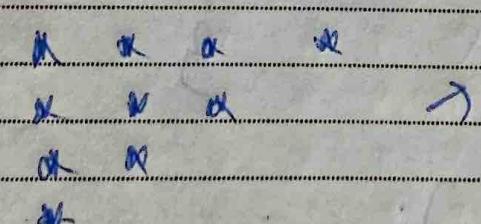
1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
27	28	29	30	31								

M	T	W	T	F	S	S	M	T	W	T	F	S
---	---	---	---	---	---	---	---	---	---	---	---	---

do-while

while

- 8) 1) First the Condition is checked, then if it's true, the Statement is executed.
- 9) 2) If condition is false, Statement will not be executed once.
- 10) 1) First statement is executed, then condition is checked.
- 11) 2) If condition is false, Statement gets executed once.
- 12) Q) Point the following Pattern :-

- 1) (a)  → Solid Rectangle & Nested loop
- 2) (b)  → hollow rectangle.
- 3) (c)  → half pyramid
- 4) (d)  → inverted half pyramid

2022

APRIL	1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20 21 22 23 24	10th Wk • 063-302
25 26 27 28 29 30	

M T W T F S S M T W T F S S

```

    count = 1;
for (i=2; i<=24; i++)
{
    for (j=1; j<=i; j++)
    {
        s.o. p[count] [count];
        count++;
    }
    s.o. p[count];
}
  
```

March

04

Friday

(d) *

→ Inverted &
rotated half pyramid

(e) 1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

→ half pyramid
with numbers

(f)

1 2 3 4 5

1 2 3 4

1 2 3

1 2

1

→ inverted
half pyramid with numbers

(g)

(1)

2 3

4 5 6

7 8 9 10

11 12 13 14 15

→ Floyd's triangle

(h)

Floyd's Triangle

(i)

0 - 1 triangle

0 1 2 3 4

even (i,j) → 1
odd (i,j) → 0

→ 0 - 1 binary
triangle.

0 1 2 3 4

1 0 1 0 1

2 1 0 1 0 1

3 0 1 0 1 0 1

4 1 0 1 0 1 0 1

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
28	29	30	31									

M	T	W	T	F	S	S	M	T	W	T	F	S
---	---	---	---	---	---	---	---	---	---	---	---	---

05

March

10th Wk • 064-301

Saturday

solutionSolid Rectangle

(a) import java.util.*;

8

Public class SolidRectangle

9

{

Public static void main (String[] args)

10

{

System.out.println ("enter length");

11

System.out.println ("enter breadth");

12

Scanner sc = new Scanner (System.in);

int length = sc.nextInt();

int breadth = sc.nextInt();

1

for (int i = 1; i <= length; i++)

2

for (int j = 1; j <= breadth; j++)

3

{

System.out.print (" * ");

4

}

System.out.println (" \n ");

5

{ } { }

6

Output

length = 4

* * * *

breadth = 5

* * * *

* * * *

* * * *

2022

APRIL	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
W	T	W	T	F	S	S	M	T	W	F

March

10th Wk • 065-300

06

Sunday

68

(II) hollow rectangle

import java.util.*;

i = row length
j = column breadth

class HollowRectangle

{ public static void main (String [] args)

{ System.out.println ("enter length");

System.out.println ("enter breadth");

Scanner sc = new Scanner (System.in);

int length = sc.nextInt();

int breadth = sc.nextInt();

for (int i = 1; i <= length; i++) {

if ((i == 1) || (i == length))

{ for (int j = 1; j <= breadth; j++) {

System.out.print ("*");

} else {

for (int j = 1; j <= breadth; j++) {

if ((j == 1) || (j == breadth)) {

System.out.print ("*");

} else {

System.out.print (" ");

System.out.println ();

output
length 24
breadth 5* * * * *
* * * * *
* * * * *
* * * * *

07

March

11th Wk • 066-299

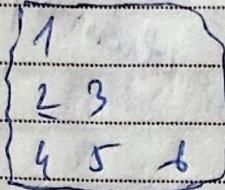
Monday

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
28	29	30	31									

M	T	W	T	F	S	S	M	T	W	T	F	S
---	---	---	---	---	---	---	---	---	---	---	---	---

Floyd's Triangle

8



10

11 12 13 14 15

1st row $\rightarrow 1+0$ 2nd row $\rightarrow 2+(1-1)$ 3rd row $\rightarrow 3+(2-1)$ 4th row $\rightarrow 4+(3-1)$.

11

 $r=1, r+0$ $r=2, r+0, r+1$

12

 $r=3, r+1, r+2, r+3$ $r=4, r+3, r+4, r+5, r+6$ $r=5, r+6, r+7, r+8, r+9, r+10, 5^0$

1	value	11
2	2	7
3	3	5
4	4	1
5	5	0

1st iteration

2

Count = 0

3

 $i=1$

4

 $j=1; j \leq 1+0; j++$ $1+0$ $2+0, 2+1$ $3+1, 3+2, 3+3$ $4+3, 4+4, 4+5, 4+6$ $5+6$

5

Count = 1;

6

Count = 1

 $i=2$ $j=2, j \leq 3; j++$ 

Count = 3;

 \rightarrow

2 3

-

2nd iteration

Count = 3;

 $i=3$ $j=3; j \leq 6; j++ \rightarrow$

Count = 6

1 2 3
3 4 5 6

2022

APRIL	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	T	W	T	F	S	S	M	T	W	F

March

11th Wk • 067-298

08

Tuesday

70

n, total number of rows = 5

Approach → ✓ think about the number of values getting printed for each row.

Total number of rows, i.e. 5.

number of values, getting printed, (j)

for i = 1, j = 1 to 1. (1 time)

for i = 2, j = 1 to 2 (2 times)

for i = 3, j = 1 to 3. (3 times)

and so on..

✓ Now, the value getting ~~printed~~ printed to the count, which gets increases by 1.

int count = 1;

for (int i = 1; i <= 5; i++) {

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

s.o. p(count);

count += i;

s.o. phn();

count = 2

j = 2

count = 4

j = 3

count = 6

j = 1, 2, 3

4, 5, 6

2022

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09

March

11th Wk • 068-297

Wednesday

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
28	29	30	31									

M	T	W	T	F	S	S	M	T	W	T	F	S
---	---	---	---	---	---	---	---	---	---	---	---	---

Binary triangle

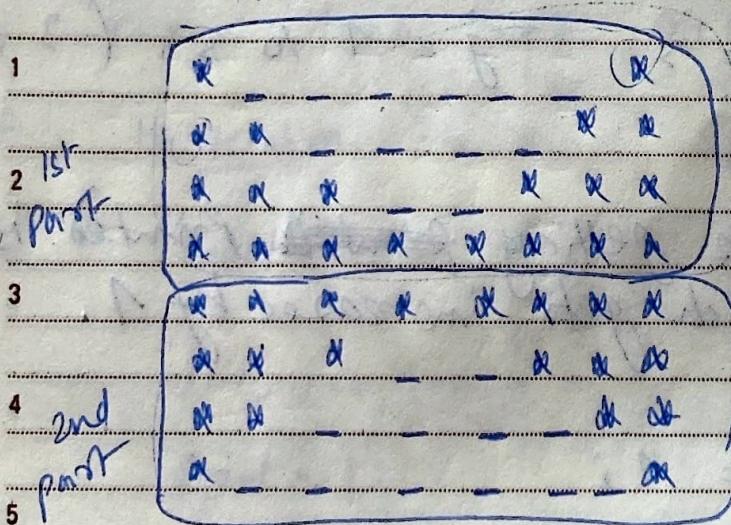
	1	0	1	3	4	5
8	1	1 (01)				
9	2	0 (02)	1 (02)			
10	3	1	0	1		
11	4	0	1	0	1	
12	5	1	0	1	0	1

$$(1,1) \rightarrow 1+1=2 \rightarrow 1$$

$$(2,1) \rightarrow 2+1=3 \rightarrow 0$$

$$(2,2) \rightarrow 2+2=4 \rightarrow 1$$

2^{m-2}
mp4

Advanced Patterns1. Butterfly Pattern

row = 8

j = 1, row / 2

j = 1, j < row, j++

K = (row - 2), K >= 2, K = K - 2

row = 8
half = 4

1st part
For spaces

$$i=1 \quad 2 \times 3 \rightarrow (n-i) \quad (4-1)$$

$$i=2 \quad 2 \times 2 \rightarrow (n-i) \quad (4-2)$$

$$i=3 \quad 2 \times 1 \rightarrow (n-i) \quad (4-3)$$

$$i=4 \quad 2 \times 0 \rightarrow (n-i) \quad (4-4)$$

2022

APRIL	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	S	T	W	T	F	S	S	M	T	W

March

11th Wk • 069-296

10

Thursday

72

for starsi=1, 1 star space 1 stari=2, 2 stars space 2 starsi=3, 3 stars space 3 starsi=4, 4 stars space 4 stars

int half = n/2;

for (int i=1; i <= n/2; i++)

{

for (int j=1; j<=i; j++)

{ s.o.p ("*"); }

for (int k=1; k < (2*(half-i)); k++)

{ s.o.p ("*"); }

for (int j=i+1; j<=i; j++)

{ s.o.p ("*"); }

}

and partfor spaces

$$i=4 \quad 2 * (\text{half} - i) = 2 * (4 - 4) = 0.$$

$$i=3 \quad 2 * (\text{half} - i) = 2 * (4 - 3) = 2$$

$$i=2 \quad 2 * (\text{half} - i) = 2 * (4 - 2) = 4$$

$$i=1 \quad 2 * (\text{half} - i) = 2 * (4 - 1) = 6$$

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2022 MARCH

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
28	29	30	31									
M	T	W	T	F	S	S	M	T	W	T	F	S

11

March

11th Wk • 070-295

Friday

2. Solid Rhombus

8

9

10

11

12

Space
 $k = (row - 1) \rightarrow P, k -$
S.O.P. (n^n);

Spaces
equal to row \rightarrow always

3. Number Pyramid

1

2

3

4

5

6

7

8

9

10

11

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15

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285

APRIL	12	13	14	15	16	17	18	19	20	21	22	23	24
5	6	7	8	9	10								
26	27	28	29	30	T	W	F	S	M	T	W	F	S

2022

March
11th Wk • 071-29412
Saturday

74

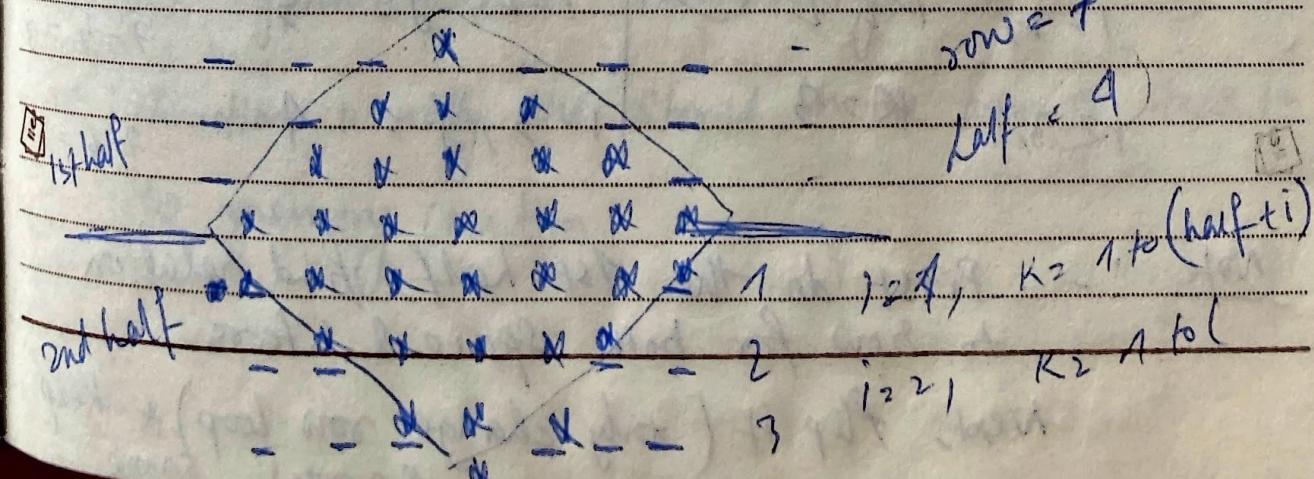
4. Palindromic Pattern

1		i=1	1	
2 1 2		i=2	2 1	(2)
3 2 1 2 3		i=3	3 2 1	2 3
4 3 2 1 2 3 4		i=4	4 3 2 1	2 3 4
5 4 3 2 1 2 3 4 5		i=5	5 4 3 2 1	2 3 4 5

For Spaces

1	Space	1	9 Space	No space in b/w
2	Space	2 1 2	5 Space	
3	2 Space	3 2 1 2 3	9 Space	
4	4 Space	4 3 2 1 2 3		$A \times A^T (A^T) = S - 2 = 3$
5	0 Space	5 4 3 2 1 2 3 4 5		$A \times A^{-1} = I$

5. Diamond Pattern



13

March

11th Wk • 072-293

Sunday

2022

MARCH

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
28	29	30	31									

M	T	W	T	F	S	S	M	T	W	T	F	S
---	---	---	---	---	---	---	---	---	---	---	---	---

 $\star \star \star$

8

9

For space, $i=1$, space(K) = 2 $K = \text{row} - i = 3 - 1 = 2$

10

$i=2$, $K = 1$ $K = 3 - 2 = 1$

11

$i=3$, $K = 0$. $K = 3 - 3 = 0$

12

For stars, $i=1, j=1$ $(2 \times i) - 1 = (2 \times 1) - 1 = 2 - 1 = 1$

1

$i=2, j=3$ $(2 \times i) - 1 = (2 \times 2) - 1 = 4 - 1 = 3$

2

$i=3, j=5$ $(2 \times i) - 1 = (2 \times 3) - 1 = 6 - 1 = 5$

3

 $\star \star \star \star \star$ $\text{row } 2$ $j = 2$

4

 $\star \star \star$ $j = 4$

5

for spaces

for stars

6

 $i=1, K=1$

$i=1, j=5, \text{row } -(2 \times i)$
 $7 - 2 = 5$

 $i=2, K=2$ $i=2, j=3$ $7 - 4 = 3$ $i=3, K=3$ $i=3, j=1$ $7 - 6 = 1$

Note 1 - First do the 1st half. Find relation to row for both space & stars.

Next, flip it (only change row loop) & keep the rest same