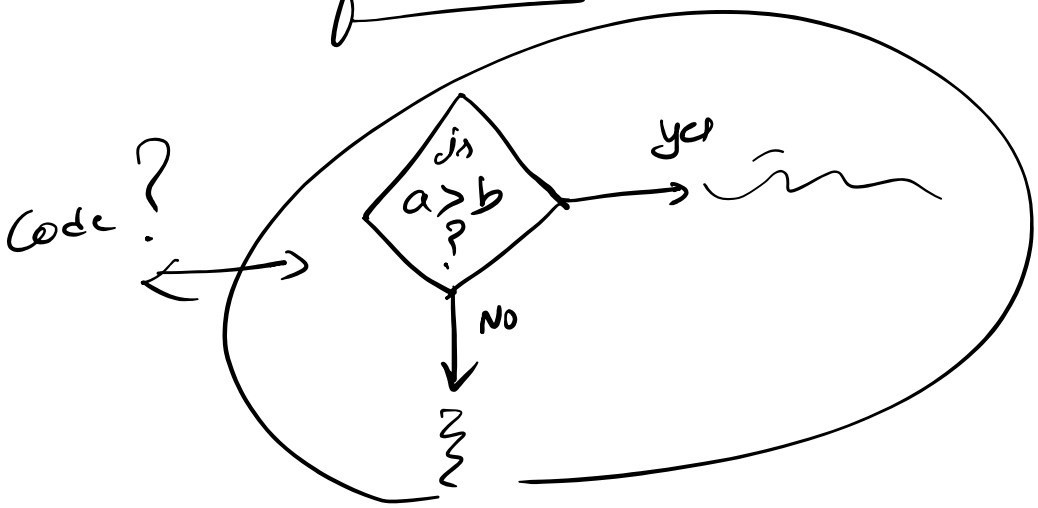
Conditionals & Loops

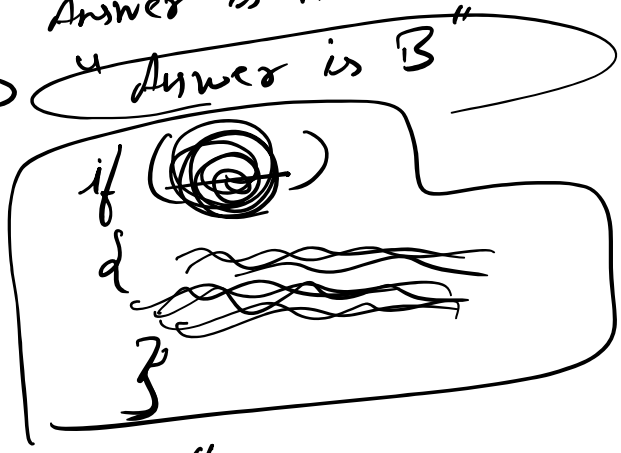
→ Conditionals

flowchart



→ P.S → i/p → a , b

o/p → a > b → "Answer is A"
b > a → "Answer is B"




```
if (a > b)
{
    cout << "Answer is A";
}
```

```
if (b>a)
{
    cout << "Answer is B";
}
```

(if)

a = 5 b = 14

```
if( )
{
}
```

```
if(a>b)
{
    do something
}
```

i/p -> a = 5

+ve
  +ve
  not +ve

```
if(a>0)
{
    print(+ve)
}
```

if-else block

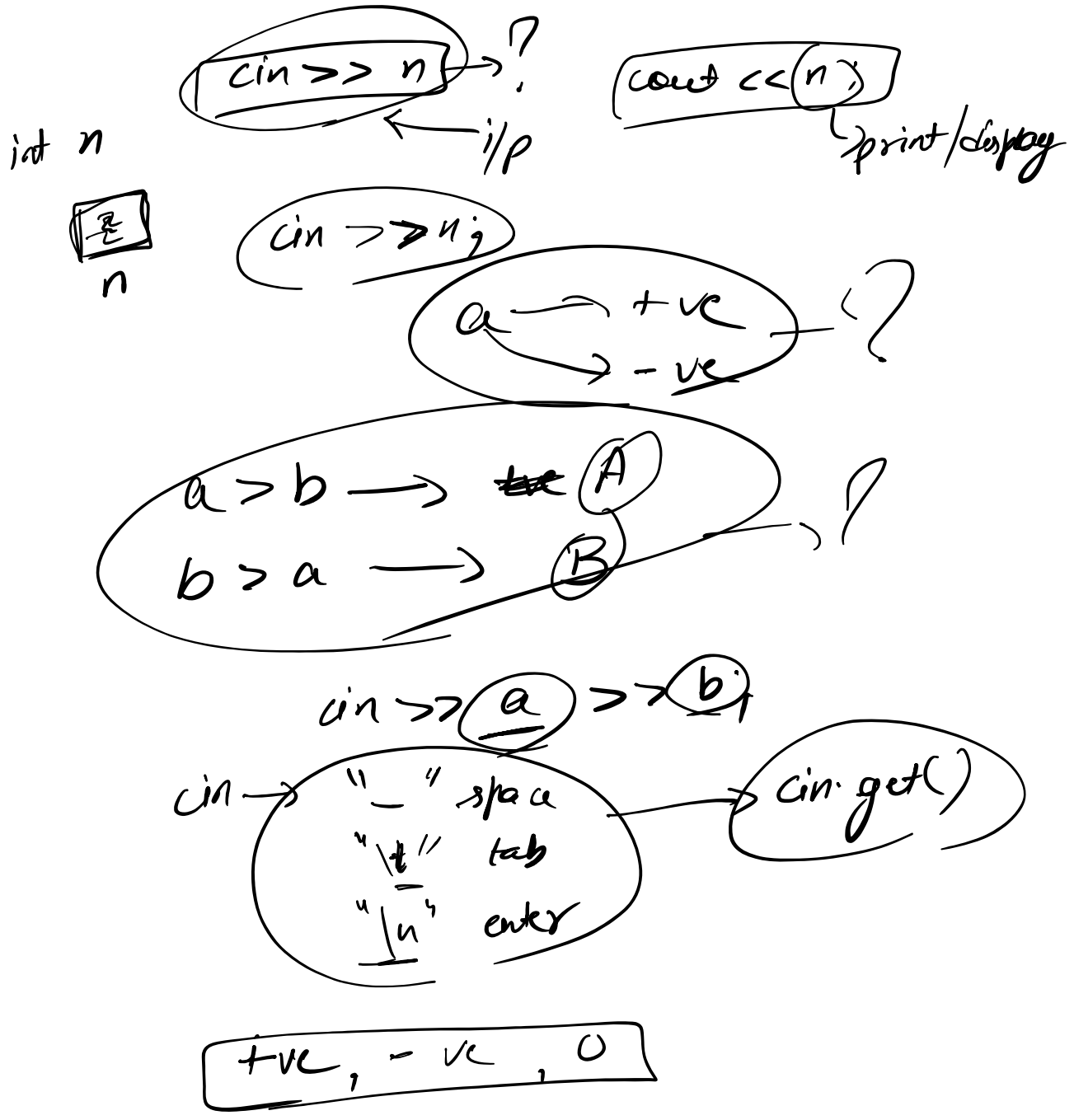
a = 5

a = -2

```
else
{
    print(not +ve)
}
```

```
if ( )
{
}
```

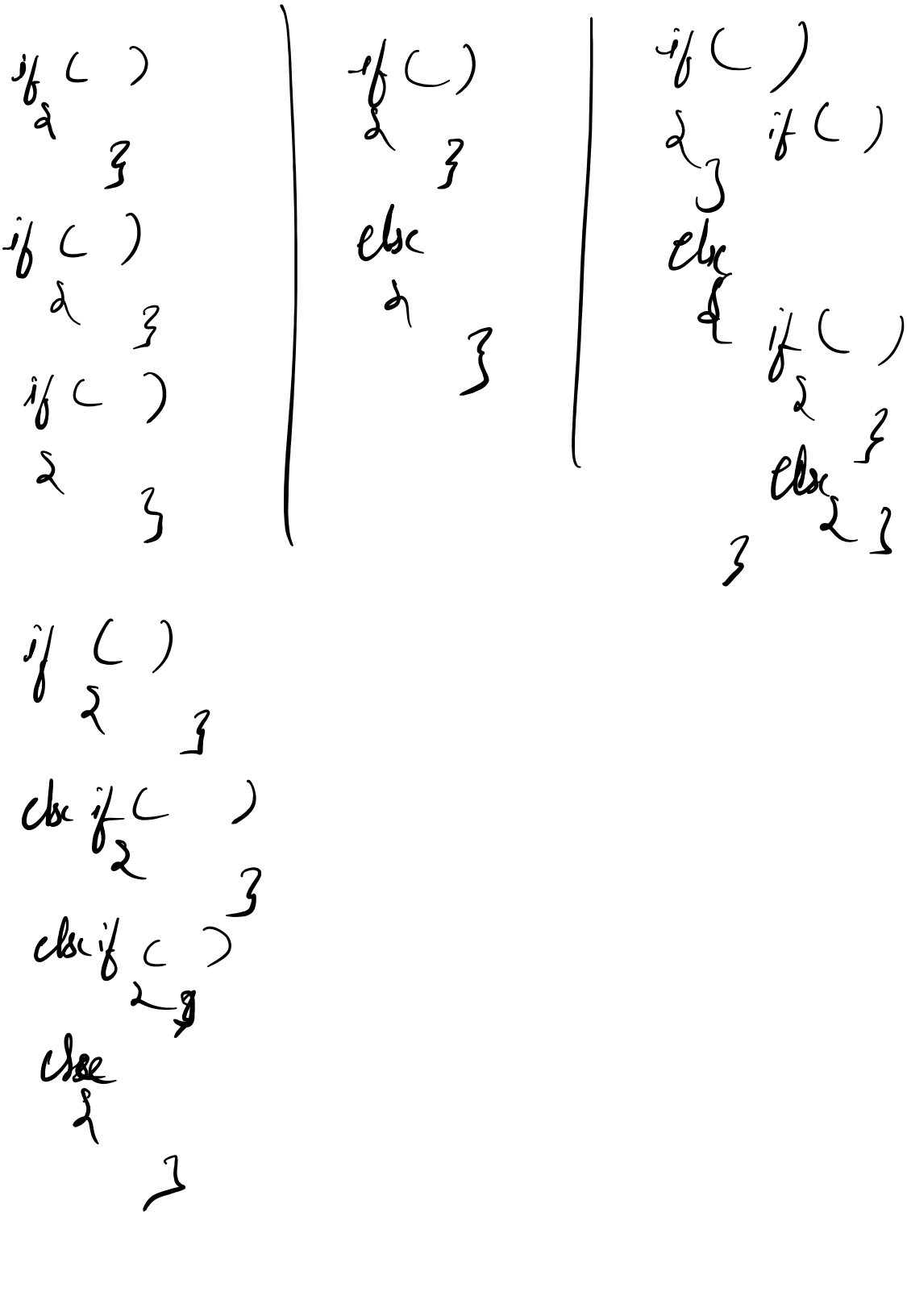
```
if ( )
{
}
else
{
}
```

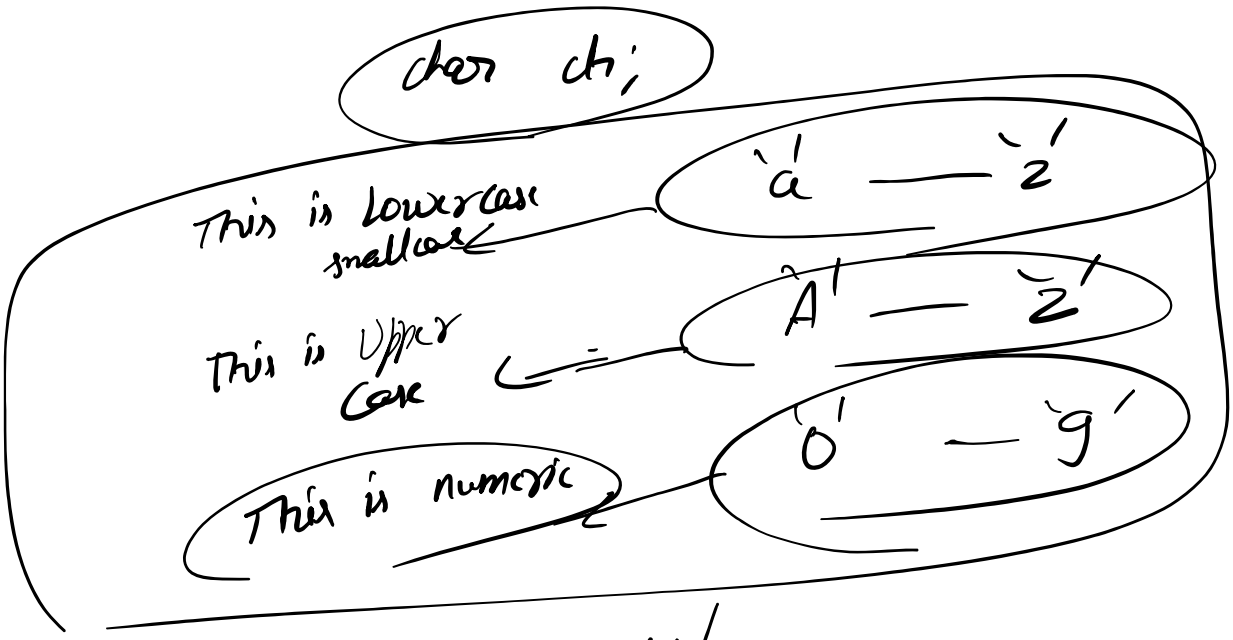

cin >> n
cout << n;
int n
i/p
print/display
是
n
cin >> n;
a → +ve
→ -ve
a > b → A
b > a → B
cin >> a >> b;
cin → " " space
"\t" tab
"\n" enter
cin.get()
+ve, -ve, 0
a = 5
if (a > 0)
{ +ve
}
-ve/0
else

```
if(a<0)
{
    -ve
}
else
{
    0
}
```

```
if ( )
{
}
else if ( )
{
}
else if ( )
{
}
else if { }
else
{
}
```

if - else - if - else

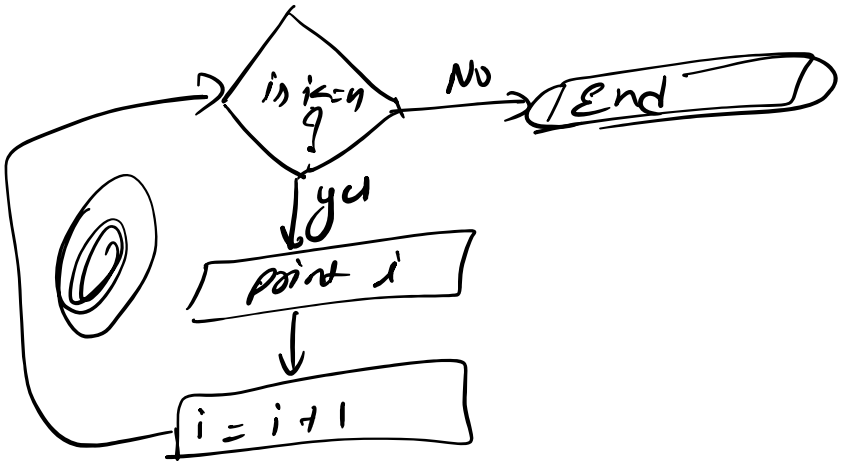




M/W

flowchart → Looping

1 — to N



Print numbers 1 to N

→ while Loop

while ( ) 조건식

{

}

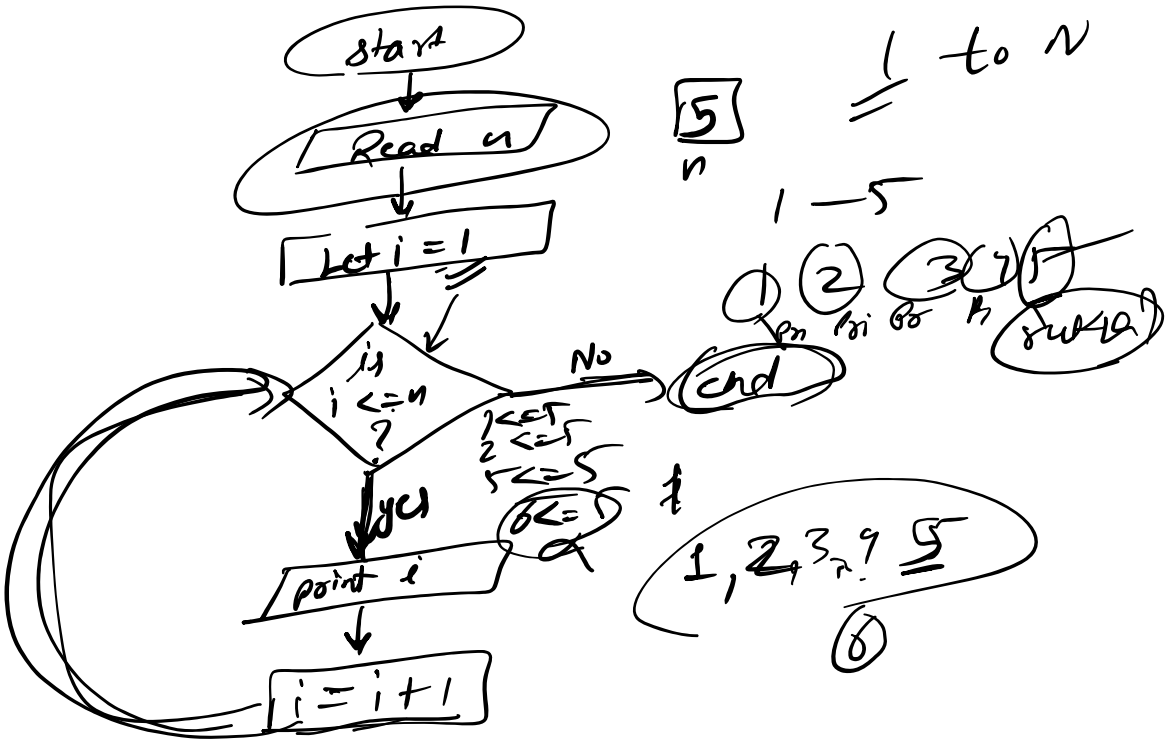
print (1 to N)

70
10
10
10
10
10
10
10
:0

while ( )

{

}



```
int n;
cin >> n;
int i=1
while (i<=n)
{ //print
  cout << i;
   i = i + 1;
}
```

1 ——— 5

1 2 3 4 5

(<=)

→ Sum → (1 to N)

1 + 2 + 3 + 4 + 5

sum = 0, 1, 3, 6, 10, 15

i = 1, 2, 3, 4, 5 & ruk gye

```
sum = 0
i = 1
while (i<=n)
{
    sum = sum + i;
    i = i + 1;
}
```

$sum = \frac{n}{2}(a+l)$

$= \frac{100}{2}(1+100)$

$= 50 \times 101 = 5050$

→ 1 to N

→ find sum of all even no (n) ← i/p → H/w

→ H/w table

fact'c

→ prime no

int n → 5

prime — ? or not

prime?

5%2 != 0

5%2 = 1

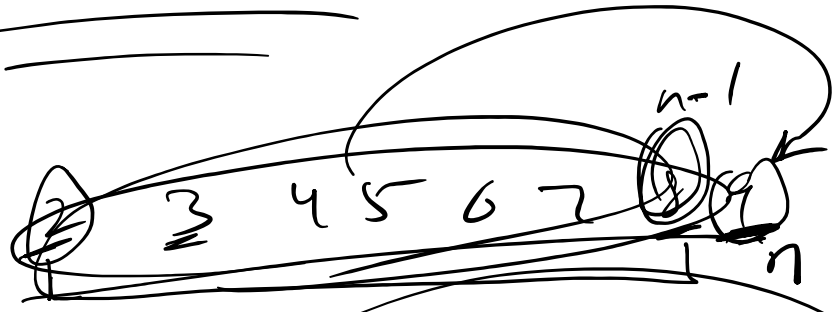
5%3 = 2

5%4 = 1

1 2 3 4 5

% → modulo opr → remainder

→ Prime or Not



% == 0 → not prime

% → 0 → prime

1 2 3 4 5 6 7 7%7==0

i<n

i<=n

1 2 3 4 5 6 7

i<n → 6

i<=n → 7

7%7==0

7

Divide

Rem == 0

prime

2 → Not prime

7 → ~

→ Pattern:-

row - 4

row → col → row

4

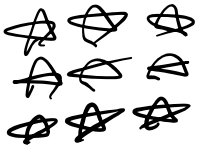
1st → 4

2nd → 4

3rd → 4

4th → 4

relation - ?



row = 3

nth row → col → row

3

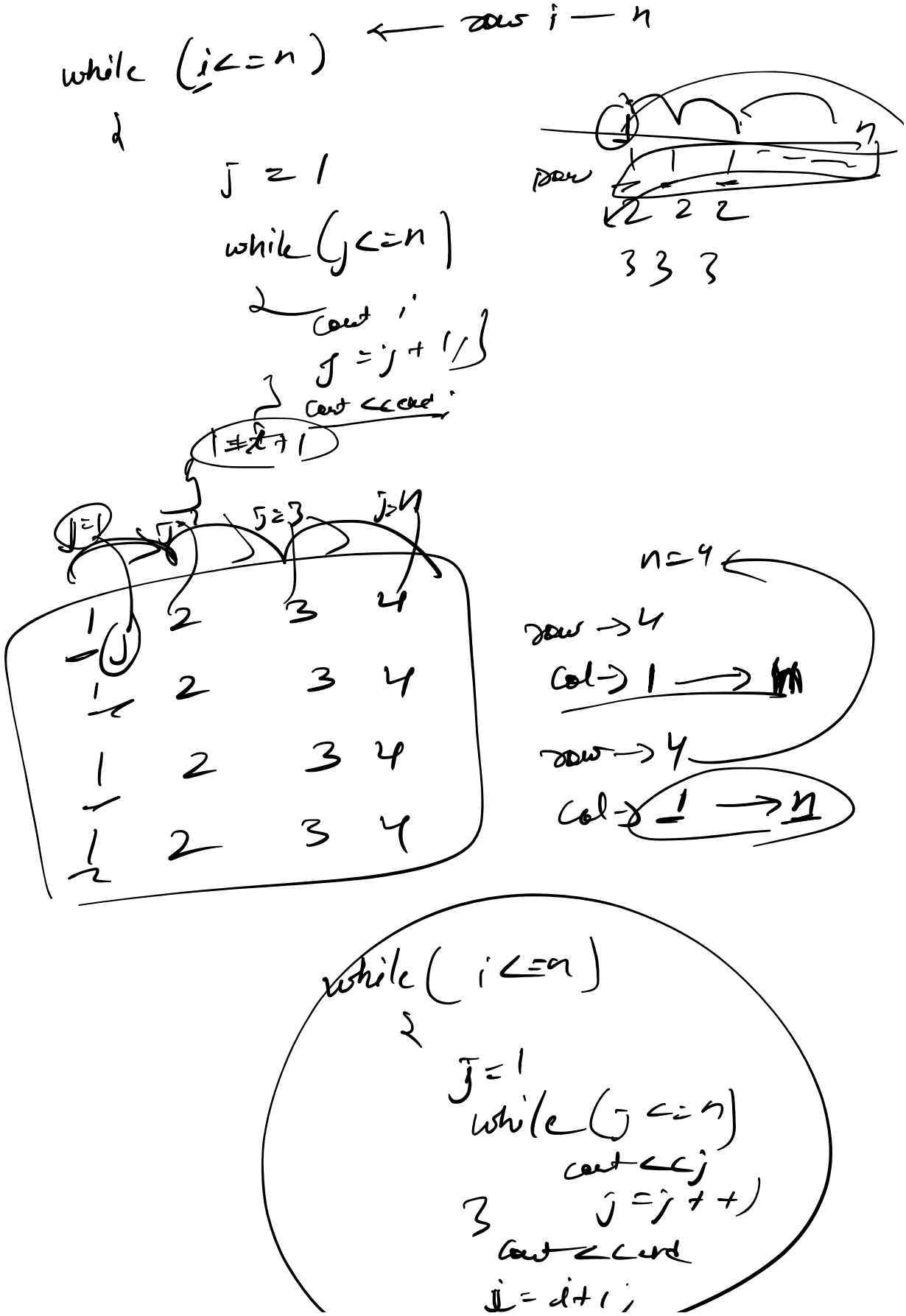
5

J

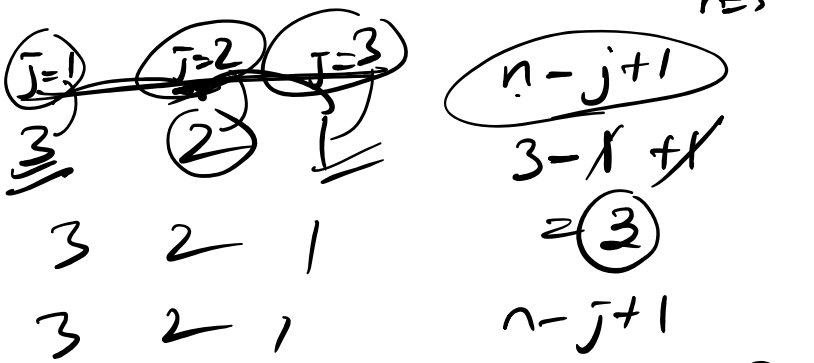
i = 1 1st → 1 1 1 0 → row = 3

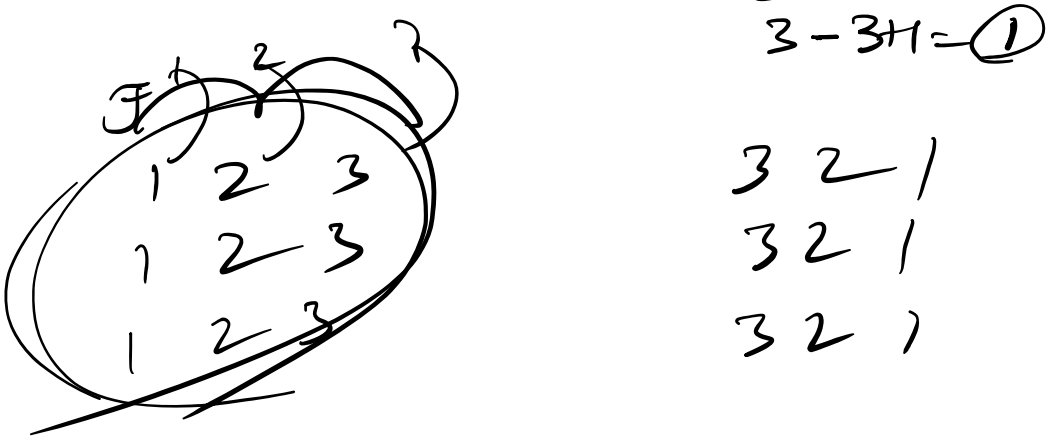
i = 2 2nd → 2 2 2 → nth row → col = i

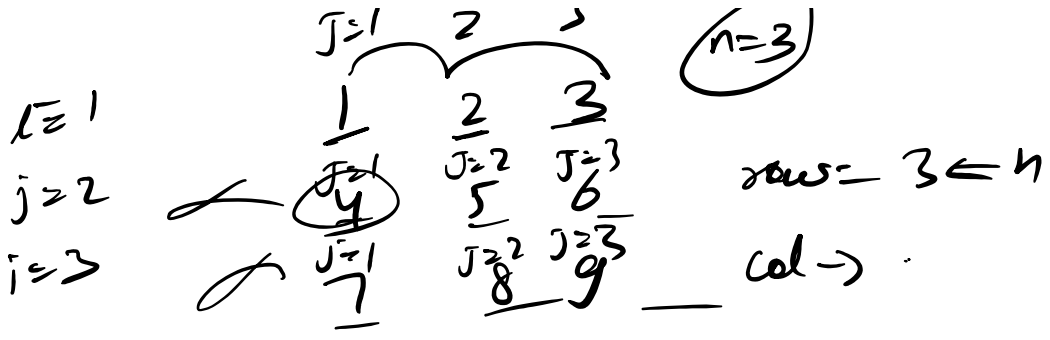
i = 3 3rd → 3 3 3 row no


row i — n
while (i<=n)
{
j = 1
while (j<=n)
{
cout i
j = j + 1;
}
cout << endl;
i = i + 1;
}
j=1
j=2
j=3
j>n
1 2 3 4
1 2 3 4
1 2 3 4
1 2 3 4
n=4
row → 4
col → 1 → n
row → 4
col → 1 → n
while (i<=n)
{
j = 1
while (j <= n)
cout << j
j = j + +)
cout << endl
i = i + 1;


j=1 j=2 j=3
1 2 3
i=1
i=2
i=3
1 2 3
1 2 3
cout << j
cout << j

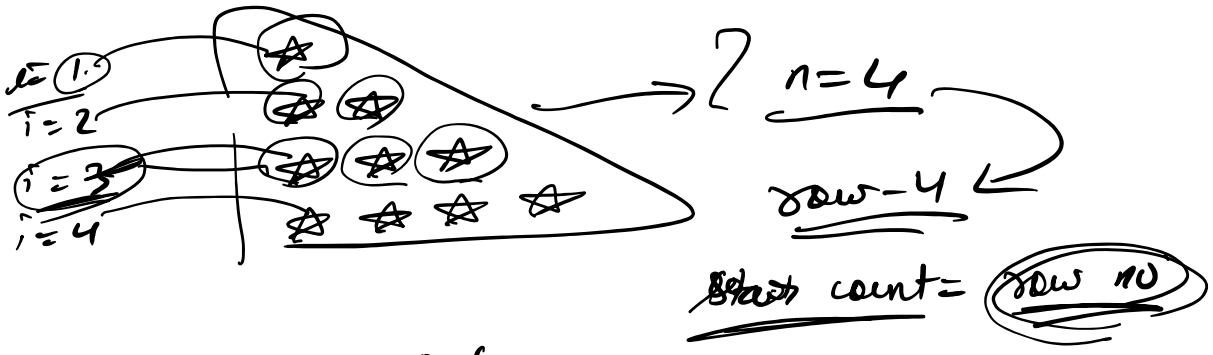

n=3
j=1 j=2 j=3
3 2 1
3 2 1
n-j+1
3-1+1
=3
n-j+1
3-2+1=2
3-3+1=1

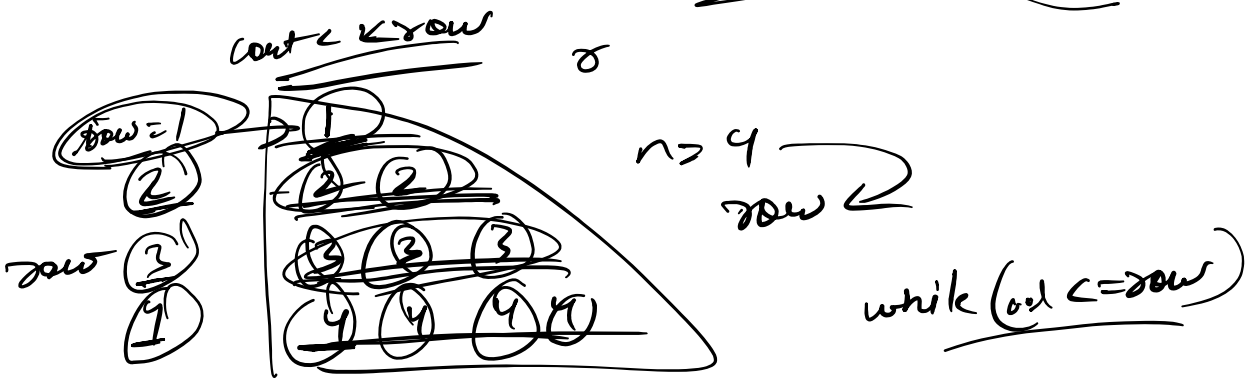

i=1 2 3
1 2 3
1 2 3
1 2 3
3 2 1
3 2 1
3 2 1

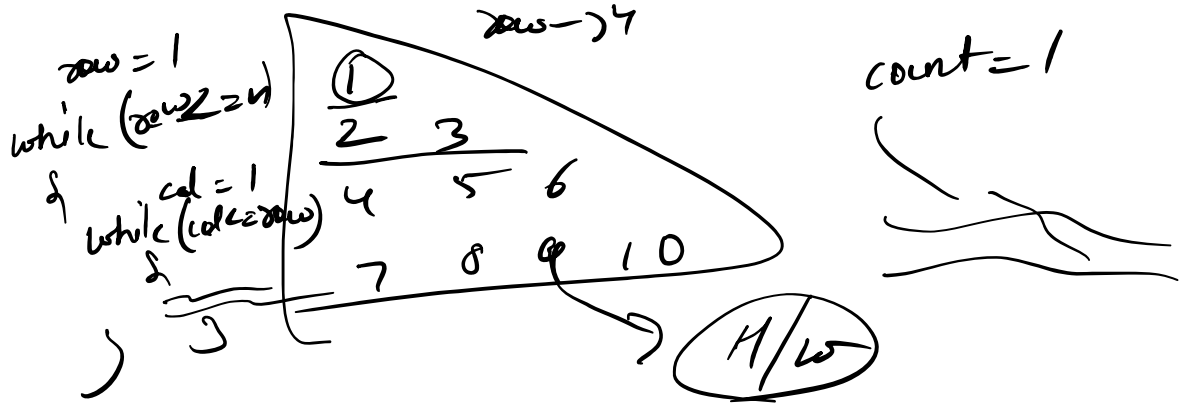


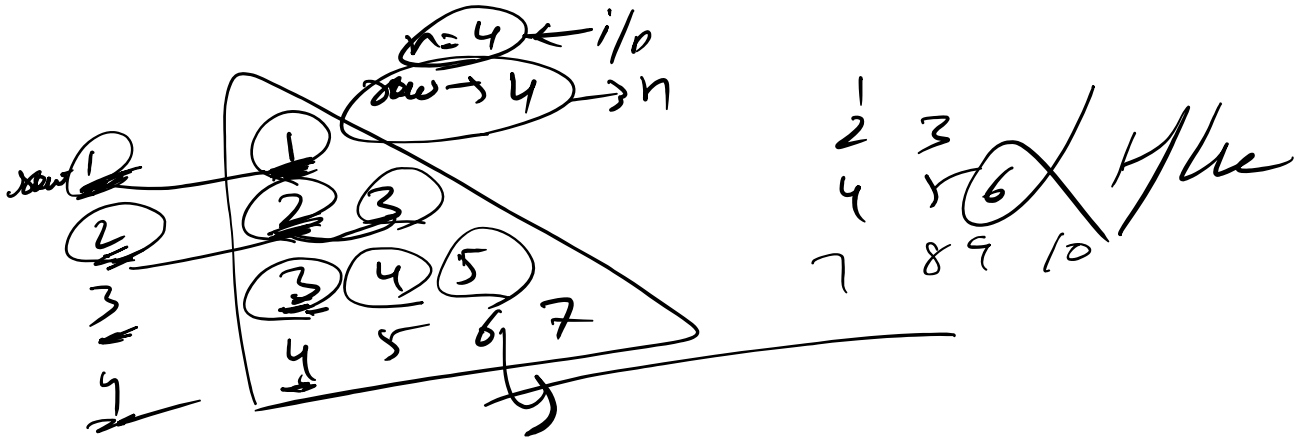
counting ..)?

count = 1









row=1

while(row <= n)

{

col=1 , int value = row

while (col <= row)

{

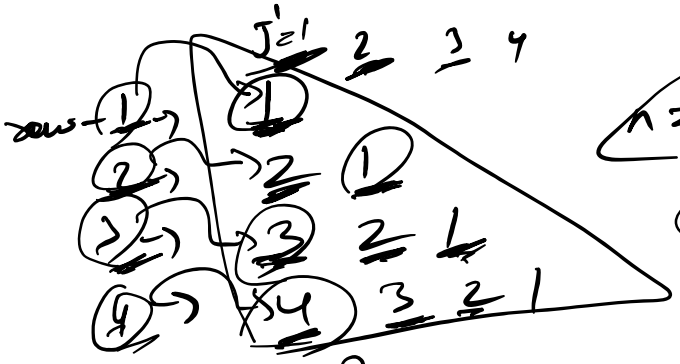
cout << value ;

value = value + 1;

}

}

Homework ?



n=4 ← i/p

row → n

while(col <= row)

{

cout << ?

}

value → ?

n-j+1

4-1+1

4-2+1

=3

3-1+1

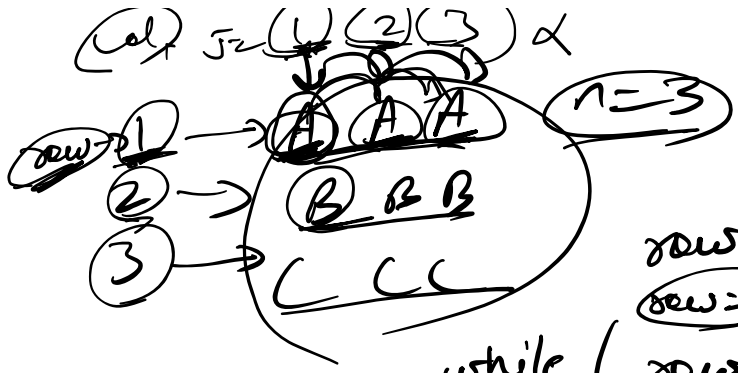
3-2+1

=2

i-j+1

1-1+1

2-1+1 2



row → 2 → n

```
row=1
while ( row <=n)
{
    cout col=1  int ch='A'
    while(col<=n)
    {
        cout<<(A'+row-1)
        col=col+1;
    }
```

char ch = 'A' + row - 1

= 'A' + 1 - 1

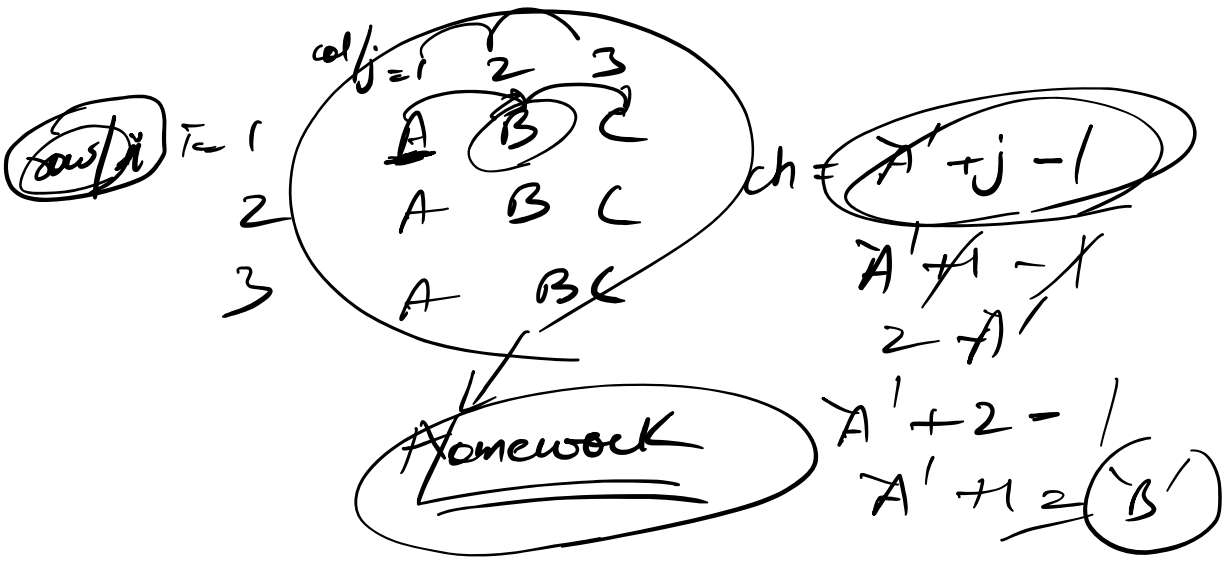
= 'A'

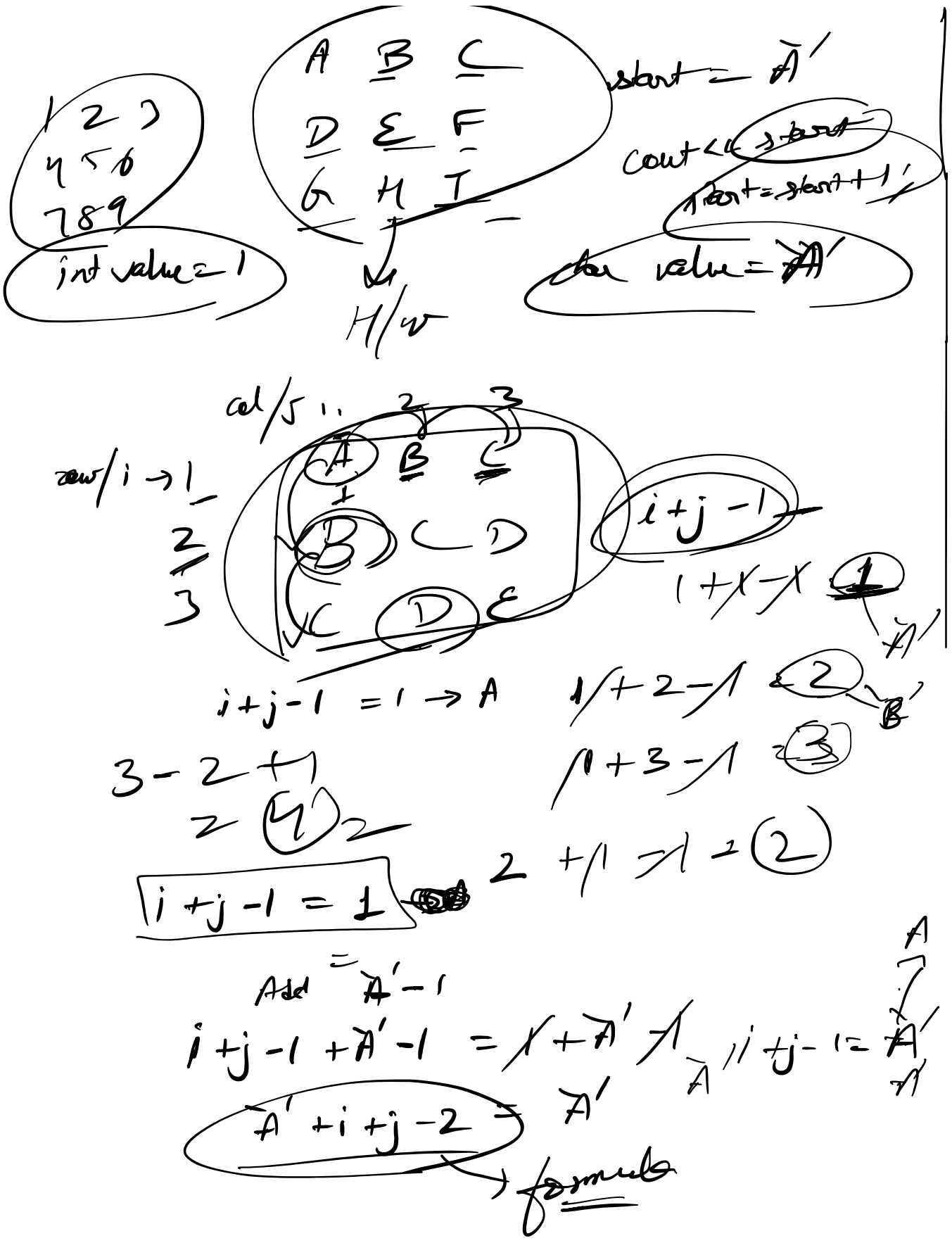
2 'A'

'A' + 2 - 1

= 'A' + 1 = 'B'

'A' + i - 1 | 'A' + row - 1




A B C
D E F
G H I
start = A'
cout << start
start = start + 1
char value = A'
1 2 3
4 5 6
7 8 9
int value = 1
H/w
col/s 1 2 3
row/i → 1
2
3
A B C
B D
C D E
i + j - 1
1 + 1 - 1 = 1 → A'
i + j - 1 = 1 → A
1 + 2 - 1 = 2 → B'
3 - 2 + 1
= 2
1 + 3 - 1 = 3
2 + 1 - 1 = 2
i + j - 1 = 1
Add = A' - 1
i + j - 1 + A' - 1 = 1 + A' - 1
i + j - 1 = A'
A' + i + j - 2 = A'
formula

```
row=1
while (row <= n)
{
    col = 1
    while (col <= n)
    {   char ch = 'A' + i + j - 2;
        cout << ch
        col = col + 1;
    }
    cout << endl;
    row = row + 1;
}
```

Increment i, j

n = 3

row ⟷ A'

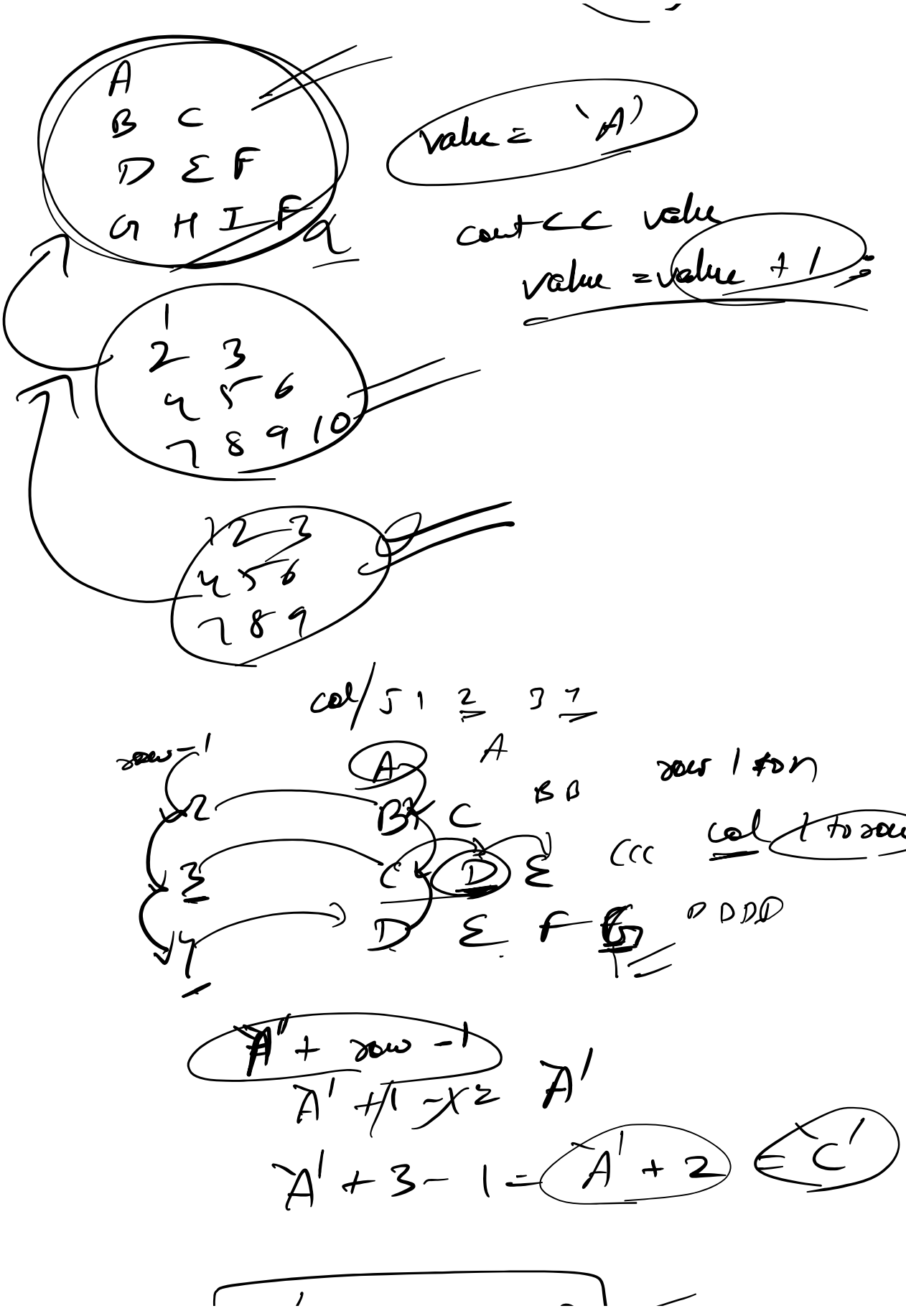
A' + row - 1

A' + 1 - 1 = A'

A' + 2 - 1 = A' + 1 = B

A' + 3 - 1 = A' + 2 = C

```
row=1
while (row <= n)
{
    col = 1
    while (col <= row)
    {
        cout << (A' + row - 1);
        col = col + 1;
    }
    endl
    row++
}
```


A
B C
D E F
G H I J K
value = 'A'
count++ value
value = value + 1
1
2 3
4 5 6
7 8 9 10
1 2 3
4 5 6
7 8 9
col/5 1 2 3 4
row=1
A
B C
D E
D E F G
row 1 to n
col 1 to row
A' + row - 1
A' + 1 - x2 A'
A' + 3 - 1 = A' + 2 ∈ C'

'A' + row + col - 2

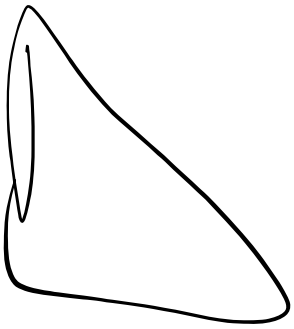
'A' + 3 + 2 - 2 = 'A' + 3

= 'D'

'A' + 4 + 4 - 2

= 'A' + 6

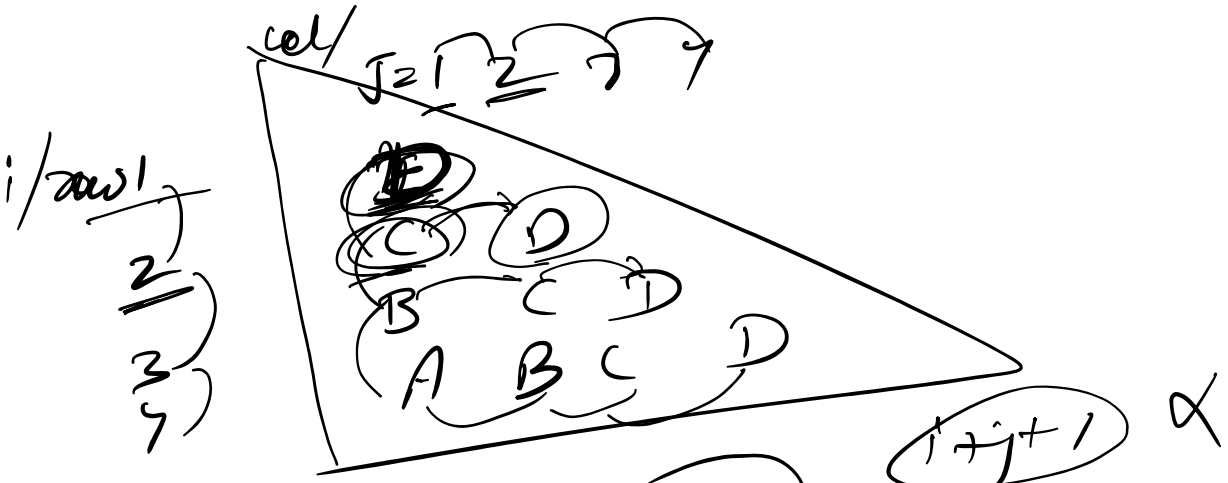
= 'G'



row 1 — n

col 1 — row

'A' + row + col - 2



'A'+4-2 = 'C'

'A'+n-i-j+1

'A'+4-2-2+1

'A'+1 = B

row -> starch -> 'A'+n-i

↳ increm-

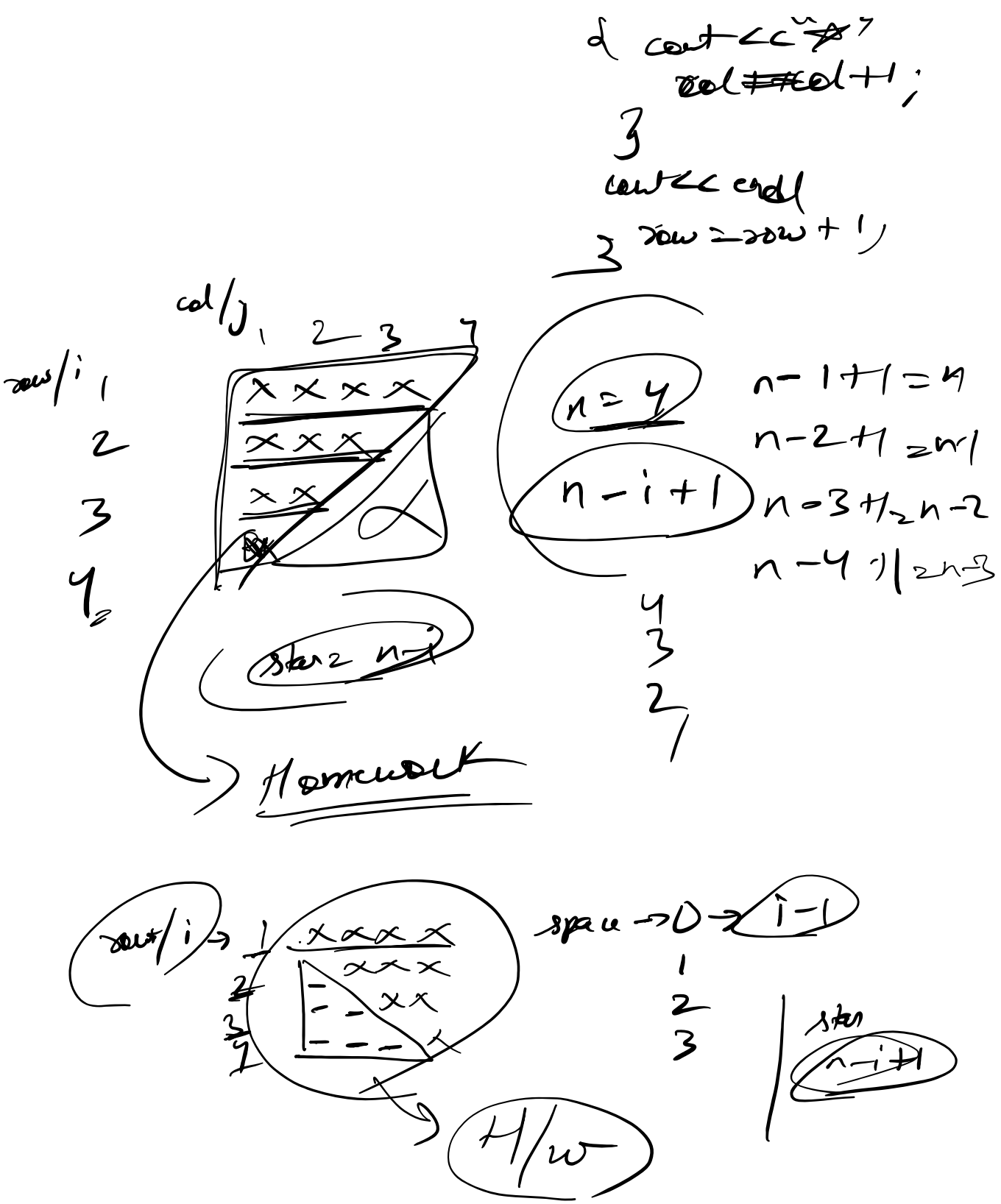
A B C

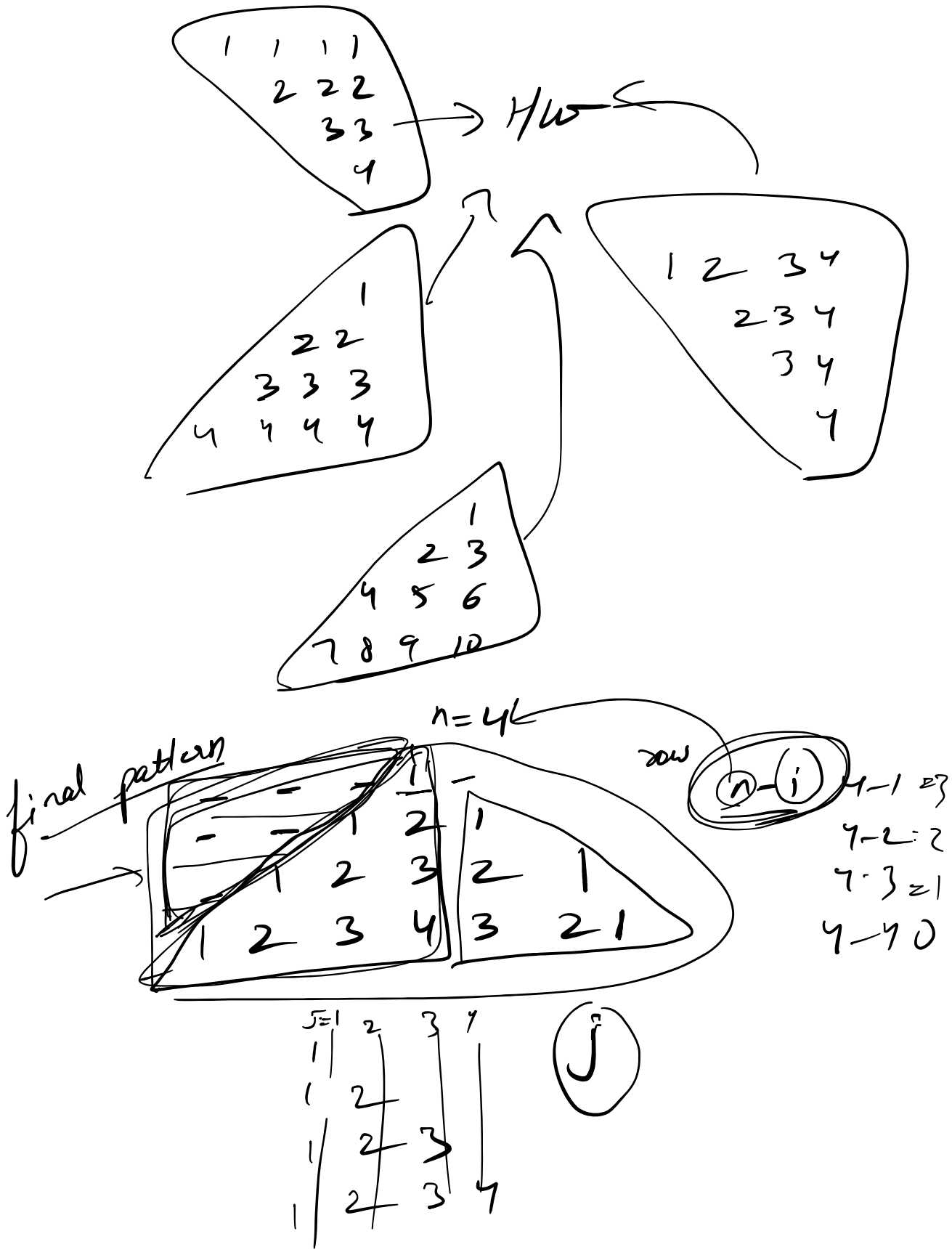
B C D

C D E

easy way ?


```
row=1
while(row <=n)
{
    int space= n-i;
    while(space)
    { cout<<" ";
      space = space-1;
    }
    int col=1
    while(col <=row)
```


cout<<"*";
col=col+1;
}
cout<<endl;
row=row+1;
col/j 1 2 3 4
row/i 1 2 3 4
n=4
n-i+1
n-1+1=n
n-2+1=n-1
n-3+1=n-2
n-4+1=n-3
4 3 2 1
star=n-i
Homework
row/i 1 2 3 4
space → 0 1 2 3 → i-1
star
n-i+1
H/W


1 1 1 1
2 2 2
3 3
4
H/w
1
2 2
3 3 3
4 4 4 4
1 2 3 4
2 3 4
3 4
4
1
2 3
4 5 6
7 8 9 10
n=4
final pattern
row
n-i
4-1 = 3
4-2 = 2
4-3 = 1
4-4 = 0
1 2 3 4
1 2 3
1 2
1
1 2 3 4
2 1
3 2 1
j=1 2 3 4
1
1 2
1 2 3
1 2 3 4
j

row / i → 1

space = i - 1

n = 5

Dabangg

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