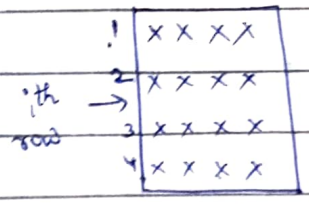
Dt 10/12/2022
Pg

Patterns - 1 Lecture

How to print Patterns ?

→ General Idea



N=4

→ No. of Rows ; No. of columns in ith row

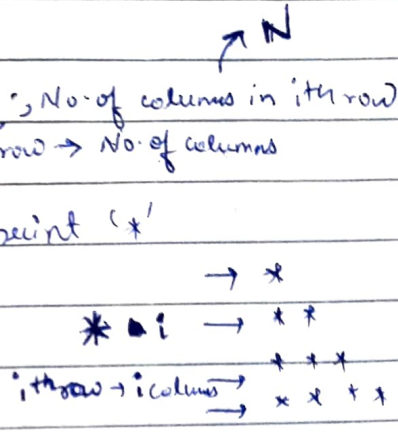
→ Generic ith row → No. of columns

N=4

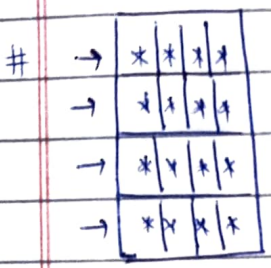
→ what to print '*'

↓

N, i, j



#



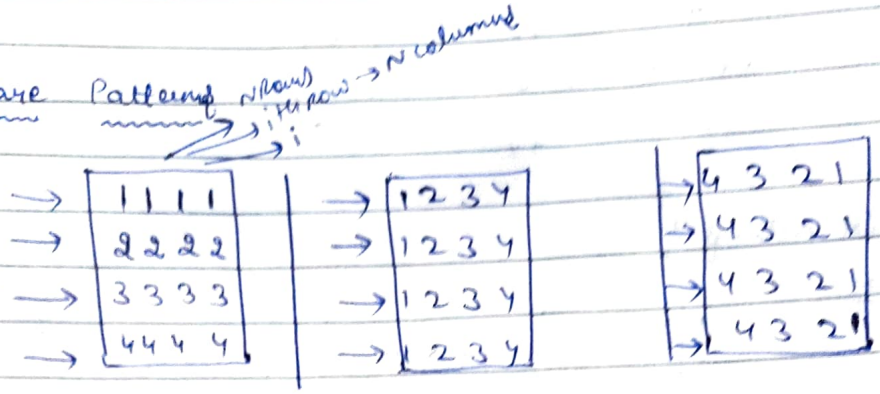
① N rows

② ith row → N columns

③ what to print → '*'

```
int i=1;
while(i<=n){
    int j=1;
    while(j<=n){
        cout<<"*";
        j++;}
    cout<<endl;
    i++;
}
```

Square Pattern




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

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

```
{
int n;
cin>>n;
int i=1;
while(i<=n){
    int j=1;
    while(j<=n){
        cout<<n-j+1;
        j++;
    }
    cout<<endl;
    i++;
}
```

Triangular Pattern

```
→ 1
→ 1 2
→ 1 2 3
→ 1 2 3 4
```

→ N Rows
→ ith row → i columns
→ column no. to print

```
→ 1
→ 2 3
→ 3 4 5
→ 4 5 6 7
```

→ N Rows
→ ith Row → i columns
→ [redacted] → print from starting row no.

```
→ 1
→ 2 3
→ 4 5 6
→ 7 8 9 10
```

→ N Rows
→ ith Row → i columns
→ print value taking [illegible] from outside the code

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

```
{
int n;
cin>>n;
int i=1;
while(i<=n){
    int j=1; int val=i
    while(j<=i){
        cout<< val; val++;
        j++;
    }
    cout<<endl;
    i++;
}
```

```
int n;
cin>>n;
int i=1; int val=1;
while(i<=n){
    int j=1;
    while(j<=n){
        cout<< val; val++;
        j++; }
    cout<<endl;
    i++;
```

WOW!

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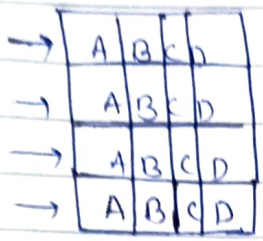
Character Patterns



'A' + j - 1

1st col → 'A' + j - 1 → 'A' + 0

2nd col → 'A' + j - 1 → 'A' + 1

3rd col → 'A' + j - 1 → 'A' + 2

4th col → 'A' + j - 1 → 'A' + 3

```
{
    int n;
    cin>>n;
    int i=1;
    while(i<=n){
        int j=1;
        while(j<=n){
    char ch= 'A'+j-1; cout<<ch;
            j++;
        }
    cout<<endl;
     i++;
    }
}
```

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startChar = 'A' + i - 1;

(3) = 'A' + j - 1;
'B' + j - 1
'C' + j - 1
'D' + j - 1
'E' + j - 1

A	B	C	D	E
B	C	D	E	F
C	D	E	F	G
D	E	F	G	H
E	F	G	H	I

→ N Rows
→ ith Row → N columns
→ For every row, starting point needs to be decided and should be known.

```
{
int n; cin>>n;
int i=1;
while(i<=n){
    int j=1; char start = 'A' + i - 1;
    while(j<=n){
        char p = start + j - 1;
        j++; }
    cout<<endl;
    i++;
  }
}
```

END of TOPIC