Pattern print

① 1
1 2
1 2 3
1 2 3 4

To print this follow status
→ i rowlo has i columns.
→ Every row starts with 1

What we have to ensure
→ i row must have i col'ns
→ ~~Ever~~ Keep a variable outside loop so that we can restart it in each row.

```
Public static void main (String[]args) {
  Scanner s= new Scanner (System.in);
     Int n = s.nextInt();  // Take user inp about rows.
     int i = 1;
      while (i <= n) {
          int J = 1;
            while (J <= i) {
              System.out.print(i); // not println to
               J++;                make sure i row
               Js.out.println();//  gets i columns
           i++;                  to ensure after completion
          }                      of row next i loop
      }                          goes to next line
```

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Print pattern 2.

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

What to ensure
→ i no. row has i no. of coln's
→ Every row continues seques.
→ a variable which is equal to 1 at the start and increases in every loop of i and j variable

```
Public static void main (String[] args) {
    Scanner s = new Scanner (System.in);
        int n = s.nextInt;
        int i = 1, int k = 1;
        while (i <= n) {
            int j = 1;
            while (j <= i) {
                S.out.print (k);
                j++;
                k++;
            }
            S.out.println();
            i++;
        }
```

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pattern 8

```
...1
..12
.123
1234
```

What to ensure

i) i no. row has ~~(n-i)~~ (n-i) no. of spaces

ii) we don't have to ensure no. of coin's while making loop for numerics.

iii) our main concern will be just to print spaces effiently then our main work is just to print numerics just after spaces.

```
Public static void main (String [] args) {
Scanner S = new Scanner (System.in);
    int n = S.nextInt();
    int i = 1;
    while (i <= n) {
        int space = 1;
        while (space <= n-i) {
            S.out.print(" "); // Now our work of printing spaces is done
        space++;}
            int j = 1;
        while (j <= i) {
            S.out.print (j);
    j++; }
        S.out.println ();
    i++;
}
```

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pattern 3

What to ensure

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

i) i no. row has n-i no. of spaces
ii) numeric values increase in i and j loop so it ~~not~~ should be declared outside i and j loop.

```
PSVM {
Scanner s = new Scanner(System.in);
int n = s.nextInt();
int i = 1, k = 1;
while (i <= n) {
    int space = 1
    while (space <= n-i) {
        S.out.print(" ");
        space ++;
    } int j = 1;
    while (j <= i) {
        S.out.print(k);
        k++;
        j++;
    }
    S.out.println();
    i++;
}
}
```