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OS Assignment 6.3

Q.1 Write an example written steps with 4 iteration of nested loop to solve below pattern.

```
#include <iostream>
using namespace std;

int main() {

    int n=5;

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

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

        cout << j << " ";

    }
for (int k=1; k<=(n-i)*2; k++){

    cout << " ";

}

for (int l=i; l>=1; l--){

    if (l!=n) {

        cout << l << " ";

    } else {

        cout << l;

    }
}
```

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1. Outer loop for rows (i): The outer loop iterates from 1 to n controlling the number of rows to be printed.

2. First inner loop for printing numbers ('j'): This loops runs from 1 to the current row number 'i' printing the ascending number

3. Second inner loop for printing empty spaces ('k'): This loop calculates number of empty spaces needed for each row it runs from 1 to '(n-i)' to print the required number of spaces.

4. Third inner loop for printing number in descending order ('j'): This one prints the number in descending order from 'i' down to 1.

5. Print newline: After completing each row the new line character 'endl' is used to move the next line.

Teacher's Signature

Q.2 Write an explanation steps with all iterations of nested loop to solve below pattern.

->

```
#include <iostream>
using namespace std;

int main() {

    int n=5;

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

        if (i==1 || i==n){

            for (int j=1; j<=n; j++

            cout << "*";

        }
    }

    else {
        for (int j=1 ; j<=n; j++){
        if (i%2!=0 || (i%2==0 && (j
            || j==n))) {

            cout << "*";
        }
        else {
        cout << "-";
    }  }  }
    cout << endl;

    }
}
```

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=) Step - I

initialize variables and outer loop start by setting up for outer loop to control the number of rows. let's denote the number of rows as 'n' which in this case is 5.

initialize a variable 'i' to iterate from 1 to 'n'

=) for the inner rows alternate between printing '+' characters and '_' characters.

use another loop to print '+' characters for odd rows and the first and last columns of even rows.

=) use appropriate loop to print '_' characters for even rows and the rest of the rows.

=) complete the outer loop and print a new line after each iteration to move to next row.