



AWESH ISLAM
BUET, CSE

BATCH RECURSION

C AND C++

PROGRAMMING MASTERCLASS

Class - 06



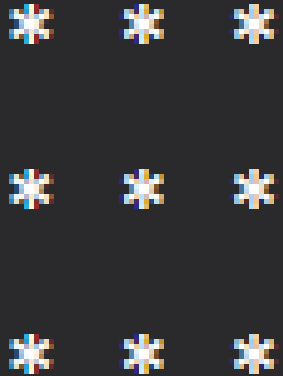
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BME, BUET

আমাদের সবগুলো ক্লাস দেখার জন্য ভিজিট করো
<https://www.hscrackers.com/>



SCAN ME

Nested Loop



A 3x3 grid of asterisks (*) on a dark background, representing the output of a nested loop program.

```
int main() {  
    for (int i=1; i<=3; i++) {  
        for (int j=1; j<=3; j++) {  
            if (i==j) {  
                printf("1 ");  
            }  
            else {  
                printf("* ");  
            }  
        }  
        printf("\n");  
    }  
}
```

```
#include<stdio.h>
```

```
int main(){  
    for (int i=1; i<=10; i++){  
        for (int j=1; j<=10; j++){  
            printf("* ");  
        }  
        printf("\n");  
    }  
}
```

Nested Loop

```
*  
**  
***  
****
```

```
int main() {  
    int n=5;  
    for (int i=1;i<=n;i++) {  
        for( int j=1;j<=i;j++) {  
            printf("* ");  
        }  
        printf("\n");  
    }  
}
```

Nested Loop

Pattern Printing using Nested While loop

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

```
int main() {
    int n=5;
    for (int i=1; i<=n; i++) {
        for (int j=1; j<=i; j++) {
            printf("%d ", j);
        }
        printf("\n");
    }
}
```

Nested Loop

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

```
int main() {
    int n=5;
    int count=0;
    for (int i=1; i<=n; i++) {
        for (int j=1; j<=i; j++) {
            printf("%d ", ++count);
        }
        printf("\n");
    }
}
```

Nested Loop

```

    *
  * * *
* * * * *
* * * * * * *
```

```
int main() {
    int n=5;
    int count=0;
    for (int i=1;i<=n;i++) {
        for (int j=1;j<=(n-i);j++) {
            printf(" ");
        }
        for (int k=1;k<=(2*i-1);k++) {
            printf("*");
        }
        printf("\n");
    }
}
```

Nested Loop

```

    *
  ***
*****
*****
*****
*****
  ***
    *

```

```
#include<stdio.h>

int main() {
    int n=5;
    int count=0;
    for (int i=1;i<=n;i++) {
        for (int j=1;j<=(n-i);j++) {
            printf(" ");
        }
        for (int k=1;k<=(2*i-1);k++) {
            printf("*");
        }
        printf("\n");
    }
    for (int i=n-1;i>0;i--) {
        for (int j=1;j<=(n-i);j++) {
            printf(" ");
        }
        for (int k=1;k<=(2*i-1);k++) {
            printf("*");
        }
        printf("\n");
    }
}
```


Brain Teaser

Write a C Program to Print all the Armstrong number between 1 to N

An Armstrong number is one whose total sum of (digits raised to the power of its total digit equals the number itself).

153 is an armstrong number because here total digit is 3 so

$\text{Pow}(1,3) + \text{pow}(5,3) + \text{pow}(3,3) = 153$

Input :

N

Expected Output:

0, 1, 153, 370, 371, 407, 1634, 8208 and 9474

You Can not User Log Functions

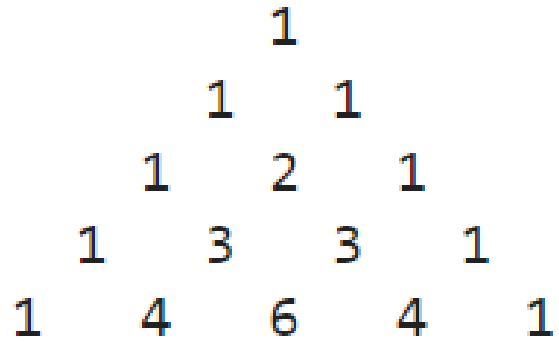
Nested Loop

1. Write a program to compute the cosine of x. The user should supply x and a positive integer n. We compute the cosine of x using the series and the computation should use all terms in the series up through the term involving x^n

$$\cos x = 1 - x^2/2! + x^4/4! - x^6/6! - \dots$$

```
int main() {
    int n=10;
    float x=3.14;
    float sum=1;
    int sign=-1;
    for(int i=2; i<=n; i+=2) {
        int fact=1;
        for(int j=1; j<=i; j++) {
            fact=fact*j;
        }
        sum+=sign*pow(x,i)/fact;
        if(sign==1) sign=-1;
        else sign=1;
    }
    printf("%f", sum);
}
```

Brain Teaser



A Pascal's Triangle diagram with 5 rows. The numbers are arranged in a triangular shape. The 5th row (the bottom row) is highlighted in red. The numbers in the 5th row are 1, 4, 6, 4, 1. The numbers in the 4th row are 1, 3, 3, 1. The numbers in the 3rd row are 1, 2, 1. The numbers in the 2nd row are 1, 1. The number in the 1st row is 1.

				1					
			1		1				
		1		2		1			
	1		3		3		1		
1		4		6		4		1	