**Recursion And Pointer:**

**Recursion:**

**//Call stack:**

#include <stdio.h>

#include <string.h>

#include <math.h>

#include <stdlib.h>

#define testcase int tc; scanf("%d",&tc);while(tc--)

#define ll long long int

//Call stack

void world(){

    printf("Hello world\n");

}

void bangladesh(){

    printf("Hello Bangladesh\n");

    world(); // call world function...

    printf("Bangladesh\n");

}

void dhaka(){

    printf("Hello Dhaka\n");

    bangladesh(); // call world function...

    printf("Dhaka\n");

}

int main() { // main function at first call and call stack automatic call it.

    dhaka();

    printf("End.....!");

    return 0;

}

**Recursion: 1 2 3 4 5**

#include <stdio.h>

#include <string.h>

#include <math.h>

#include <stdlib.h>

#define testcase int tc; scanf("%d",&tc);while(tc--)

#define ll long long int

int func(int i,int n){

    if(i==n+1) return 0;

    printf("%d\n",i);

    return func(i+1,n);

}

int main() {

    int n;

    scanf("%d",&n);

    func(1,n);

    return 0;

}

**Recursion: 5 4 3 2 1**

#include <stdio.h>

#include <string.h>

#include <math.h>

#include <stdlib.h>

#define testcase int tc; scanf("%d",&tc);while(tc--)

#define ll long long int

int func(int n){

    if(n==0) return 0; //just return..

    printf("\n%d",n);

    return func(n-1);

}

int main() {

    func(5);

    return 0;

}

**Recursion: 5 4 3 2 1 Also.**

#include <stdio.h>

#include <string.h>

#include <math.h>

#include <stdlib.h>

#define testcase int tc; scanf("%d",&tc);while(tc--)

#define ll long long int

void fun(int i){

    if(i==6) return;

    fun(i+1); // 5 4 3 2

    printf("%d\n",i);

}

int main() {

    fun(1);

    return 0;

}

**Pointer:**

**Pointer:**

#include <stdio.h>

#include <string.h>

#include <math.h>

#include <stdlib.h>

#define testcase int tc; scanf("%d",&tc);while(tc--)

#define ll long long int

int main() {

    int x = 10;

    int \*ptr = &x; // 4 bytes store.

    /\*

    printf("X er address: %p\n", &x); //%p

    printf("ptr er value: %p\n", ptr);

    printf("ptr er address: %p", &ptr);

    \*/

    x=200;

    printf("X er value: %d\n", x); //%p

    printf("x er dereferance value: %d\n", \*ptr);

    return 0;

}

X er value: 200

x er dereferance value: 200

**Call by value:**

#include <stdio.h>

#include <string.h>

#include <math.h>

#include <stdlib.h>

#define testcase int tc; scanf("%d",&tc);while(tc--)

#define ll long long int

void fun(int x){

    printf("Fun x different address: %p\n",&x);

}

int main() {

    int x=10;

    printf("main x er address: %p\n",&x);

    fun(x);

    x = 200;

    return 0;

}

main x er address: 0x7ffe1d46717c

Fun x different address: 0x7ffe1d46715c

**Call by reference:**

#include <stdio.h>

#include <string.h>

#include <math.h>

#include <stdlib.h>

#define testcase int tc; scanf("%d",&tc);while(tc--)

#define ll long long int

void fun(int \*p){ // x er address assign here

    printf("Main er x er value: %d\n",\*p);

    \*p=500; // dereferance...

}

int main() {

    int x=10;

    printf("x er address: %p\n", &x);

    fun(&x);

    printf("x er value: %d\n", x);

    return 0;

}

x er address: 0x7ffe7f4e280c

Main er x er value: 10

x er value: 500