C Pointer

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[1] Pointer demo

```
#include <stdio.h>
#include <conio.h>
void main()
{
   int n=50;
   int *p=&n;

   printf("\n Address of p =%x",p);
   Printf("\n value at p= %d",*p);

   getch()
}
```

OUTPUT

Address of p = fff4
value at p = 50

Example [1]

[2] call by value

```
// call by value demo
#include<stdio.h>
#include<conio.h>
void change (int num)
{
  printf("\n Before adding value inside
        function num is =%d",num);
  num = num+100 //num+=100; //200
printf("\n After Adding value inside
        function num = %d ",num);
}
```

name = Makwana Pritam P.
Roll No = 1072
GR NO = 2020BCA67

name:- Mukwana Pritam P.
GRNo:- 2020BCA67
Roll No:- 1072

```
Void main ()
{
  int x=100;
  printf("\n Before function call x=%d",x);
   change(x);

  printf("\n after function call x=%d",x);
   getch();
}
```

OUTPUT

```
Before function call x = 100
Before adding value inside function num
is = 100
After adding value inside functio num
=200
after function call x=100
```

example 2

[3] Call by value : demo (Prototype function)

```
#include<stdio.h>
#include<conio.h>
   ;
   ;
Void swap(int,int);
Void main()
{
  int a=10;
  int b=20;
  clrscr();
```

name:- Mukwana Pritam P.
GRNo:- 2020BCA67
Roll No:- 1072

```
printf("before swapping value in main a=%d,b=%d",
      a,b);
 swap(a,b);
printf("\n after swapping the value a=%d,b=%d"
     ,a,b);
 getch();
}
      Void swap(int a,int b)
{
   int temp;
   temp =a;
    a=b;
    b=temp;
    printf("\n I am in swap=After swapping
          value of a=%d, b=%d",a,b);
}
```

OUTPUT

```
before swapping value in main a=10,b=20
I am in SWAP After swapping value
of a=20,b=10
After swapping the value a=10, b=20
```

end(2)

[4] Call by reference demo (*num Pointer)

```
#include<stdio.h>
#include<conio.h>
Void change(int *num)   //fff4
{
 printf("\n Before adding value inside function
       num=%d",*num);
       (*num)+=100;  //num=num+200  //fff4  100+100
}
```

100
100
150

```
Void main()
{
 int x=100;
 clrscr();
 printf("before function call main x=%d",x);
 change(&x);
 printf("\n after function call x=%d",x);
 getch();
}
```

OUTPUT

before function call main x=100
Before adding value inside function num=100
after function call x=200

[5] call by reference (a+=*num=a+num=

```
#include<stdio.h>
#include<conio.h>
void change(int *num)
{
 int a=50;          //fff4
 printf("\n Before adding value inside function
        num=%d",*num);
   a+=*num;        // a=50+100
   *num=a;
}
Void main()
{
 int x=100;  //fff4      //100
 clrscr();
 printf("before function call main x=%d",x);
 change(&x);   //fff4   //100
 printf("\n after function call x=%d",x);
 getch();
}
```

OUTPUT

before function call main x=100
Before adding value inside function num=100
after function call x=150

[6] call by reference example-2

```
#include<stdio.h>
#include<conio.h>
Void swap(int*, int*);
Void main()
{
  int a=10;
  int b=20;
  printf("Before swipping the value in main
        a=%d,b=%d\n",a,b);

    swap(&a,&b);
    printf("After swapping value in main
        a=%d,b=%d\n",a,b);
    getch();
}
Void swap(int *a,int *b)
{
    int temp;
    temp =*a    //(a)fff4   //fff5 (b)
   *a =*b;
```

```
printf("After swapping value in function
        a=%d, b=%d", *a, *b);
}
```

OUTPUT

Before swapping the value in main a = 10,
b = 20,
After swapping values in function a = 20,
b = 10,
After swapping value in function a = 20,
b = 10,

7 Recision

```
#include<stdio.h>
#include<conio.h>
void count_to_ten(int cnt)
{
  printf("** %d **\n", cnt);
  if(cnt<10)
  {
    count_to_ten(cnt+1);
  }
}
void main()
{
  clrscr();
  count_to_ten(0);
  getch();
}
```

OUTPUT

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

Array

[1] array demo

```
#include<stdio.h>
#include<conio.h>
Void main()
{
  int age[5];   //array Variable
  //int i;      //normal variable
  clrscr();
  age[0]=10;
  age[1]=40;
  age[2]=50;
  age[3]=5;
  age[4]=9;

printf("\n Element at 0 is %d", age[0]);
printf("\n Element at 1 is %d , age[1]);
printf("\n Element at 2 is %d , age[2]);
printf("\n Element at 3 is %d , age[3]);
printf("\n Element at 4 is %d , age[4]);

getch();
}
```

output

```
Element at 0 is 10
Element at 1 is 40
Element at 2 is 50
Element at 3 is 5
Element at 4 is 9
```

(2) array is scanf and printf short -

```
#include<stdio.h>
#include<conio.h>
Void main()
{
 int age[5];
 int i;
 clrscr();
 for(i=0;i<5;i++)
 {
  printf("\n Enter Value for Element at %d:",i);
  scanf("%d",&age[i]);
 }
 for(i=0;i<5;i++)
 {
  printf("\n Element at %d is %d",i,age[i]);
 }
 getch();
}
```

output

```
Enter value for Element at 0 = 10
Enter value for Element at 1 = 12
Enter Value for Element at 2 = 15
Enter value for Element at 3 = 20
Enter Value for Element at 4 = 25

Element at 0 is 10
Element at 1 is 12
Element at 2 is 15
Element at 3 is 20
Element at 4 is 25
```

[3] One dimensional ~~array~~ array in short scanf and Printf use

```
// arry demo
#include<stdio.h>
#include<conio.h>
void main()
{
  int age[5];
  int i;

Printf("\n enter value for 5 element in age");
for (i=0; i<5; i++)
{
 scanf("%d", &age[i]);
}
printf("\n Value of Age");
for (i=0; i<5; i++)
{
  printf("\n age[%d] = %d", i, age[i]);
}
 getch();
}
```

Output

```
enter value for 5 element in age 2
8
5
9
10
Value of Age
age[0] = 2
age[1] = 8
age[2] = 5
age[3] = 9
age[4] = 10
```

[4]

```
#include<stdio.h>
#include<conio.h>
void main()
{
 int sr[10];
 int i;
 int j=0;
 clrscr();
 for (i=0; i<10; i++)
 {
  j++;
  sr[i] = j*j;
 } Printf("\n square of 1 to 10");
 for (j=0; j<10; j++)
 {
  Printf("\n square %d", sr[i]);
 }
  getch();
 }
```

Output

```
square of 1 to 10
square 1
square 4
square 9
square 16
square 25
square 36
square 49
square 64
square 81
square 100
```

5 two dimensional array (two&multi)

```
#include <stdio.h>
#include <conio.h>
void main()
{
 int disp[3][5];
 int i,j;
 clrscr()
for (i=0;i<3;i++){
   for(j=0;j<5;j++){
    printf("Enter value for disp[%d][%d]:",i,j);
    scanf("%d",&disp[i][j]);
   }
 }
Printf("Two Dimensional array elements:\n");
for(i=0;i<3;i++){
  for(j=0;j<5;j++){
   printf("%d",disp[i][j]);
   if(j==4){
     printf("\n");
   }
  }
}
getch();
}
```

OUTPUT

```
Enter Value for disp[0][0]: 10
Enter Value for disp[0][1]: 20
Enter Value for disp[0][2]: 30
Enter Value for disp[0][3]: 40
Enter Value for disp[0][4]: 50
Enter Value for disp[1][0]: 11
Enter Value for disp[1][1]: 22
Enter Value for disp[1][2]: 33
Enter Value for disp[1][3]: 44
Enter Value for disp[1][4]: 55
Enter Value for disp[2][0]: 100
Enter Value for disp[2][1]: 200
Enter Value for disp[2][2]: 300
Enter Value for disp[2][3]: 400
Enter Value for disp[2][4]: 500

10  20  30  40  50
11  22  33  44  55
100 200 300 400 500
```

6 Multi Dimensional Array Example

```
#include<stdio.h>
int main()
{
   int test[2][3][2];

Print("Enter 12 values:\n");
```

```
for (int i=0 ;i<2 ;++i)
{
   for (int j=0;j<3;++j)
   {
     for (int k=0 ;k<2;++k)
     {
      scanf ("%d" &test [i][j][k]);
     }
   }
}
Printf ("\n displaying value:\n");
 for (int i=0;i<2;++i)
  {
     for (int j=0;j<3;++j)
      {
      for (int k=0;k<2;++k)
      {
       Printf ("test [%d][%d][%d]=%d\n",i,j,k,test
            [i][j][k]);
      }
     }
}
return 0;
}
```

Output

```
Enter 12 values:
1
2
3
4
5
6
7
8
9
10
11
12
displaying values:
test [0][0][0]=1
test [0][0][1]=2
test [0][1][0]=3
test [0][1][1]=4
test[0][2][0]=5
test[0][2][1]=6
test[1][0][0]=7
test[1][0][1]=8
test[1][1][0]=9
test[1][1][1]=10
test [1][2][0]=11
test [1][2][1]=12
```

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Structure

[1] structure demo

```
#include<stdio.h>
# include<conio.h>
struct Point
{
    int x,y;
    char nm[25];
};
Void main()
{
 struct Point p1 ={0,1,"darsh"};
 clrscr();
 //Accesing members of Point p1
 p1.x =20;
 printf("x= %d, y=%d name=%s",p1.x,p1.y,p1.nm);
 getch();
}
```

Output

x =20, y=1 name= darsh

[2] Array of structure

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

struct Point
{
  int x,y;
};
```

struct ની બહાર variable ની value deler ના થાય પહેલા variable decler થાય છે

```
void main()
{
    struct Point arr[10];
    clrscr();
    arr[0].x =10;
    arr[0].y =20;

    Printf("%d %d",arr[0].x,arr[0].y); getch();
}
```

Output

10 20

[3] UDF functions:-

no arguments and No Return value

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

Void greatNum(); //function declaration
                        Prototype
Void main()
{
  greatNum(); //function call
  getch();
}
void greatNum() //function definition
{
  int i,j;
```

```
printf("Enter 2 number that you want to
        compare...");
scanf("%d %d",&i,&j);

if(i>j){
  printf("The greater number is:%d",i);
}
else{
  printf("The greater number is: %d",j);
}
}
```

Output

```
Enter 2 number that you want to
compare....To 20
The greater number is 20
```

4 Function with no argruments and a return value

```
#include <stdio.h>
#include <conio.h>
int greatNum();

void main()
{
  int result;
  result=greatNum();
printf("The greater number is:%d",result);
  getch();
}
```

```
int greatNum()
{
  int i,j,greaterNum;
printf("Enter 2 number that you want to
        compare....");
scanf("%d%d",&i,&j);

if(i>j){
   greaterNum=i;
}
else{
   greaterNum=j;
}
//returning the result
return greaterNum;

}
```

Output

```
Enter 2 number that you want to
compare....To 20
The greater number is 20
```

5 function with argrument and No return value

```
#include
void greatNum(int a, int b) //function declar-
                            // ation
intmain()
{
  int i,j;
```

```
printf("Enter 2 numbers that you want
        to compare....");
scanf("%d %d",&i,&j);
greatNum(i,j); //function call

~~greatNum(i,j);~~
  return 0;
}
Void greatNum(int x,int y) //function defini
s
  if(x>y){
  printf("The greater number is: %d",x); }
  else{
  printf("The greater number is: %d",y);}
}
```

OutPut

```
Enter 2 Number that you want
to compare.....10 20
The greater number is 20
```

6 Function with arguments and ~~no~~ a. Return value;-

```
#include <stdio.h>

int greatNum(int a,int b) //function declaration

int main()

{
int i,j,result;
printf("Enter 2 numbers that you want
        to compare....");
scanf("%d%d",&i,&j);

result=greatNum(i,j)

Printf("The greater number is:%d",result);
  return 0;
}
int greatNum(int x,int y)
{
   if(x>y){
     return x;
   }
   else{
     return y;
   }
}
```

OutPut

```
Enter 2 Number that you want to
compare.....10 20
The greater number is 20
```

7 UDf with structures

```
#include<stdio.h>

struct student{
    char name[50];
    int age;
};
// function prototype
void display (student s);

void main (){
    struct student s1;
    clrscr();
    printf ("Enter name: ");
//read string input foroom the 2user until\n is
  enterd
//\n is discardard
//scanf ("%.[^\n]%*c",s1.name);
scanf ("%s",&s1.name);

Printf ("Enter age:");
scanf ("%d",&s1.age);

display(s1); //Passing struct as an argument
  getch();
}
Void display (struct student s){
   printf ("\nDisplaying information\n");
   printf ("Name:%s",s.name);
   printf ("\nAge:%d",s.age);

}
```

OUTPUT

```
Enter name: kishan
Enter age: 33

Displaying information
Name: Bond
Age: 73
```

9 Nested Structure in C

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

struct address
{
  char city[20];
  char pin[6];
  char phone[14];
};
struct employee
{
   char name[20];
   struct address add;
};
void main()
{
  struct employee emp;
  clrscr();
  printf ("Enter employee information? NAME, CITY,
        ,PIN, MOBILE\n");
  scanf ("%s%s%s%s",emp.name,emp.add.city
        &emp.add.pin,emp.add.phone);
```

```
printf("\n name :%s:", emp.name);
printf("\n city:%s:", emp.add.city);
printf("\n Mobile Phone:%s", emp.add.phone);
printf("\n Pin :%s:", emp.add.pin);

getch();
}
```

Output

```
Enter employee information! NAME,CITY,PIN,Mob
Pritam
Amreli
365601
9909517537
name: Pritam:
city: Amreli:
phone:365601:
Pin :9909517537:
```

10 Union

```
#include <stdio.h>
#include <conio.h>
// Declaration of union is same as
// structures
Union test {
    int x,y;
};

Void main ()
{
  // A Union variable t
  Union test t;

  t.x = 2; // t.y also gets value 2
  Printf ("After making x=2:\n x=%d, y=%d\n
        \n", t.x, t.y);

  t.y = 10; // t.x is also updated to 10
  Printf ("After making y=10:\n x=%d, y=%d\n\n",
        t.x, t.y);

  return 0;
}
```

Output

```
After making x=2;
x=2, y=2
After making y=10;
x=10, y=10
```

- only quize
- Program factorial :-

```
#include <stdio.h>
#include <conio.h>
void main()
{
  int n;
  int fact=1;
  int i;
  clrscr();
```

```
printf("\n Enter value");
scanf("%d", &n);
for (i=1; i<=n; i++)
{
  fact = fact * i;
}
Printf("Factorial Value of %d is %d", n, fact);
getch();
}
```

output

```
Enter value 5
Factorial Value of 5 is 120
```

```
#include <stdio.h>
#include <conio.h>
long int multiplyNumbers (int n);
void main ()
{
  int n;
  Printf("Enter a positive integer: ");
  Scanf("%d", &n);
  Printf("Factorial of %d = %ld", n, multiplyNumbers
    (n));
  getch ();
}
long int multiplyNumbers(int n){ //3
  if (n>=1)
  return n*multiplyNumbers (n-1); // 5-1=4
                                  // 4-1=3
```

```
else
  return 1;
}
```

output

```
Enter a Positive integer : 120
Factorial of 5 = 120
```

- Fibonacci series 0,1,1,2,3,5

```
#include <stdio.h>
#include <conio.h>
int main ()
{
  int i,n, t1=0, t2=1, nextTerm;
  Printf("Enter the number of terms: ");
  Scanf("%d", &n);          //6
  Printf("\n Fibonacci series: ");

  for (i=1; i<=n; ++i)
  {
    Printf("%d", t1);       //0,1,1,2
    nextTerm = t1+t2;       // 1+2 nextTerm=3
    t1=t2;                  //t1=2
    t2 = nextTerm;          //t2=3
  }
  getch ();
}
```

output

```
Enter the number of terms:
Fibonacci series: 0,1,1,2,3,5,8
```

Unit-5

Pointer and Arrays in C

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1. //Pointer to array demo

```
#include<stdio.h>
#include<conio.h>
Void main()
{
  int I;
  int a[5]={1,2,3,4,5};
  int *p=a;  //same as int *p=&a[0]
  clrscr();
  for(i=0;i<5;i++)
  {
  Printf("\n %d",*p);
  Printf("\n Add %x",p);
  p++;
  }
  getch();
}
```

→ OUTPUT

```
1
Add ffec
2
Add ffee
3
Add fff0
4
Add fff2
5
Add fff4
```

2. Pointer to Array of structures in C

```
#include<stdio.h>

struct my-structure{
    char name[20];
    int number;
    int rank;
};

Void main()
{
  struct my-structure v={"study Tonight",35,7};
    //fff1
  Struct my-structure *ptr;
  ptr=&v;
  clrscr();

Printf("\n Using POINTER to access structure\n");
Printf("NAME : %s\n", ptr->name);
Printf("NUMBER : %d.\n", ptr-> number);
Printf("RANK : %d", ptr -> rank);

Print.f("\n\n USING structure to access structure\n");
Printf("\n NAME =%s", v.name);
Printf("\n NUMBER= %d", v.number);
Printf("\n RANK =%d", v.rank);
getch();

}
```

→ output

```
USING POINTER to access structure
NAME: StudyTonight
NUMBER:35
RANK :1

USING structure to access structure
NAME: StudyTonight
NUMBER:35
RANK :1
```

3 Pointer to Pointer

```
#include <stdio.h>
void main(){
    int number=50;
    int *p; //Pointer to int
    int **p2; //Pointer to Pointer
    p=&number; //store the address of number variable
    p2=&p;
    clrscr();

Printf("Address of numbers variable is %x \n",
        &number);
Printf("Address of p variable is %x\n",p);
Printf(" Value of *p variable is %d \n",*p);
Printf(" Address of p2 variable is %x\n",p2);
Printf(" Value of **p2 variable is %d\n",**p2);
 getch();
}
```

output

```
Address of number variable is fff4
Address of p variable is fff4
Value of *p variable is 50
Address of p2 variable is fff2
Value of **p2 variable is 50
```

(7) ~~Pattis work: Parelize work~~ Logical work

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

void main()
{
 int i;
printf("\n Enter any number");
 scanf("%d",&i);

if(i<0)
  printf("\n This is negative number");

else if(i==0)
  printf("\n This is zero");

else if (i>0)
  printf("\n This is positive number");

 getch();
}
```

Output

```
Enter any number 5
This is positive number
```

(2) Logic Work :-

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

Void main()
{
  int i,j;

  clrscr();

  for(i=65;i<=97;i++)
  {
    for(j=65;j<=i;j++)
    {
      printf("%c",j);
    }
    printf("\n");
  }
  getch();
}
```

Output

```
A
B B
C C C
D D D D
E E E E E
```

(3) Logic Work :-

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

void main()
{
  int i=0;
  temp;
  printf("\n%d",i);
  i=i+1;
  if(i<=100)
  {
    goto temp;
  }
  getch();
}
```

Output

```
1
2
3
:
:
98
99
100
```

(4) Logic Work :-

```
#include<stdio.h>
#include<conio.h>
void main()
{
```

```
int i;
int v[5];
int s;
int temp=0;

clrscr();
for(i=0;i<=5;i++)
{
   Printf("\n Enter five numbers");
   Scanf("%d",&v[i]);
}
printf("\n Enter value five to search");
scanf("%d",&s);

for (i=0;i<5;i++)
{
   if(v[i]==s)
   {
      temp=1;
   }
}
  if(temp==1)
     printf("\n value found");
  else
    printf("\n value is not found");

  getch();
}
```

output

```
Enter five number to
20
30
40
60
Enter value five to search
30
Value found
```

(5) Logical work;

```
//sum of Total digit
#include<stdio.h>
#include<conio.h>
void main()
{
  int i=124,m;
  int sum=0;
  clrscr();
 while(i>10)
 {
  m=i%10;
  printf("\n REMINDER %d ",m);
   sum=sum+m;
    i=i/10
 }
 Printf("\n sum of Digit %d",sum);
 getch();
}
```

Output ->

```
REMINDER 4
REMINDER 2
REMINDER 1
Sum of Digit 7
```

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new file create

~~logic work~~

- File Input/output in C

[4]

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

void main () {

FILE*fp;

fp = fopen ("amreli.text","wt");
fprintf (fp,"%s %s %s %d","we","are","in",2020);

fclose (fp);

}
```

-> Bin folearder in a (c turbo) in a Bin->

file name ->	amreli.text
in ->	we are in 2020

Note- #include <stdlib.h> in use memory use folder create:

(5) file reading:-

Note -> c.turbu in output view used 'r' mode.
-> 'r' mode use reding.

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```
#include<stdio.h>

void main () {
  FILE *fp;
  int c;
  clrscr();
  fp = fopen ("amrli.text","r");
  while(1){
    c = fgetc(fp);   //character read
    if (feof (fp) ){  //file end of file
      break;
    }
    Printf("%c", c);
  }
  fclose(fp);
  getch();
}
```

Output

we are in 2020

(6) ~~FRE Oppen~~ OFREOPEN()

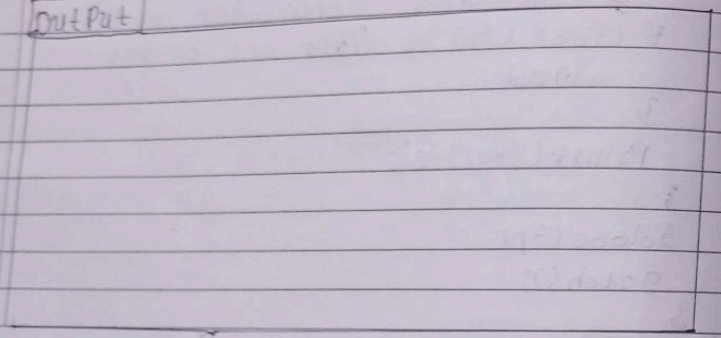
```
#include<stdio.h>
void main () {
  FILE*fp

  Printf(" This text is redirected to
  stdout\n");

  fp = freopen ("ksc.txt","w+",stdout);
```

```
printf("This text is redirected to ksc.txt");
fclose(fp);
getch();
}
```

Output



(7) REMOVE() use file delete

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

void main() {
  int ret;
  FILE *fp;

  char filename[] = "ksc.txt"

  fp = fopen(filename,"w");
  ret = remove(filename);
```

```
if(ret==0) {
  printf("file deleted successfuly");
}
else{
  printf("Error: unable to delete the file");
  }
  getch();
}
```

Output

```
file deleted successfuly
```

8 ~~REMO~~ RENAME() use name change

```
#include()

void main() {
 int ret;
    char oldname[] = "ksc.txt";
    char newname[] = "kscARCA.txt";

  ret = rename(oldname, newname);

  if (ret==0)
  {
   Printf("file renamed successfully.");
  }
```

```
else
Printf ("Error: unable to rename the file");
}
getch();
}
```

output

File renamed successfully