C
lab 6

Dr : Ghada

Eng : Gehad Mustafa

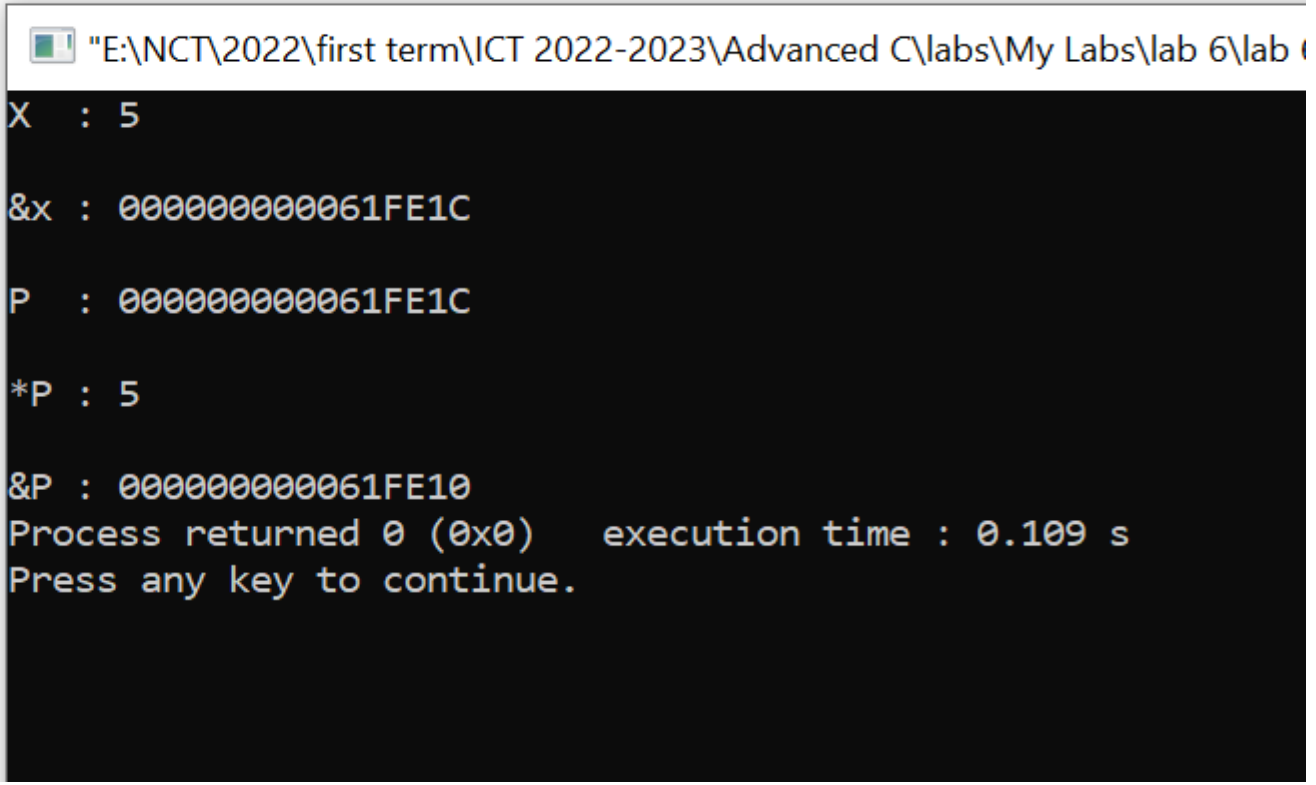
Eng : somaya

Content

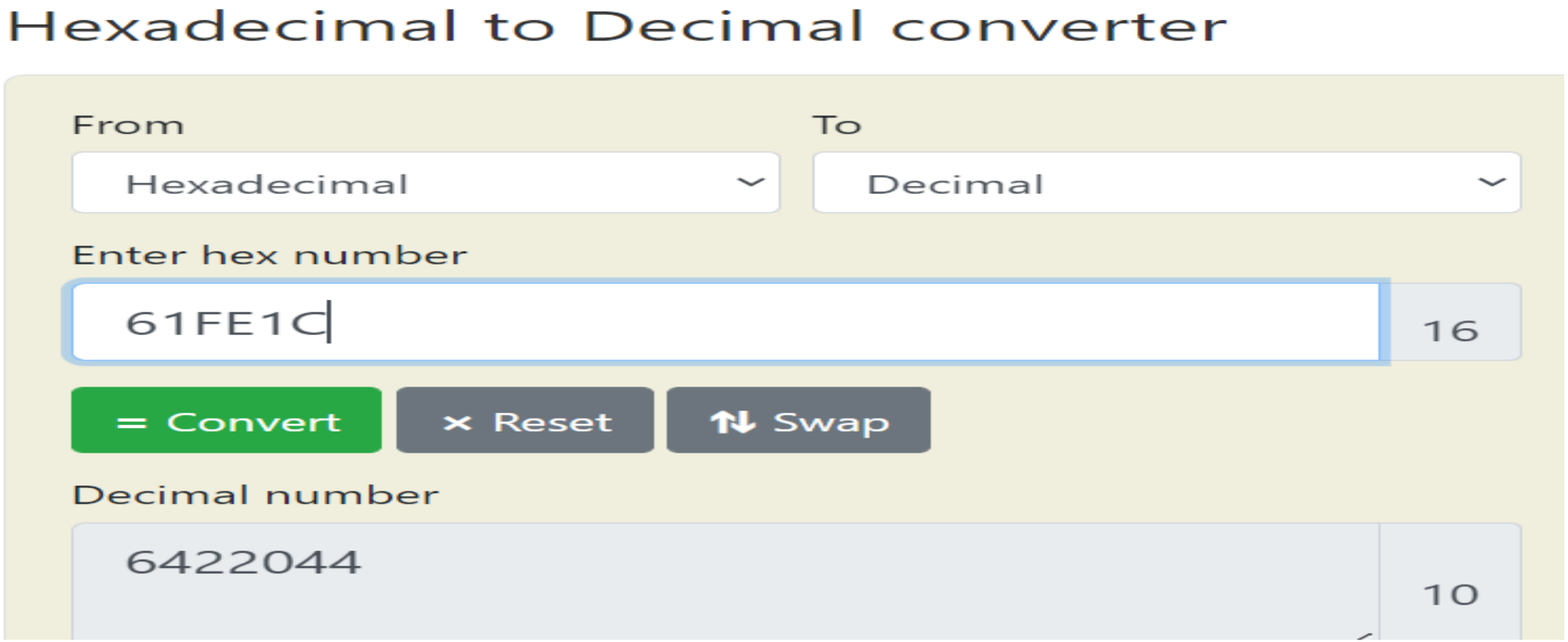
- Pointers

pointers

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

int main()
{
    int x=5;
    printf("X   : %d\n\n",x);

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

    int *p=&x;
    printf("P   : %p\n\n",p);

    printf("*P  : %d\n\n",*p);

    printf("&P  : %p",&p);
    return 0;
}
```



Addresses


Hexadecimal to Decimal converter
From
Hexadecimal
To
Decimal
Enter hex number
61FE1C
16
= Convert
× Reset
⇅ Swap
Decimal number
6422044
10

pointers

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

int main()
{
    int x=5;
    printf("X   : %d\n\n",x);

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

    int *p=&x;
    printf("P   : %p\n\n",p);
    printf("int(p)  : %i\n" ,p);
    printf("P+1: %p\n\n",p+1);
    printf("int(p+1)  : %i\n" ,p+1);
    printf("*P  : %d\n\n",*p);

    printf("&P  : %p",&p);

    return 0;
}
```

```
"E:\NCT\2022\first term\ICT 2022-2023\Advanced C\labs\My Labs\lab
X   : 5

&x  : 000000000061FE1C

P   : 000000000061FE1C

int(p)  : 6422044
P+1: 000000000061FE20

int(p+1)  : 6422048
*P  : 5

&P  : 000000000061FE10
Process returned 0 (0x0)   execution time : 0.125 s
Press any key to continue.
```

Operators

nain.c

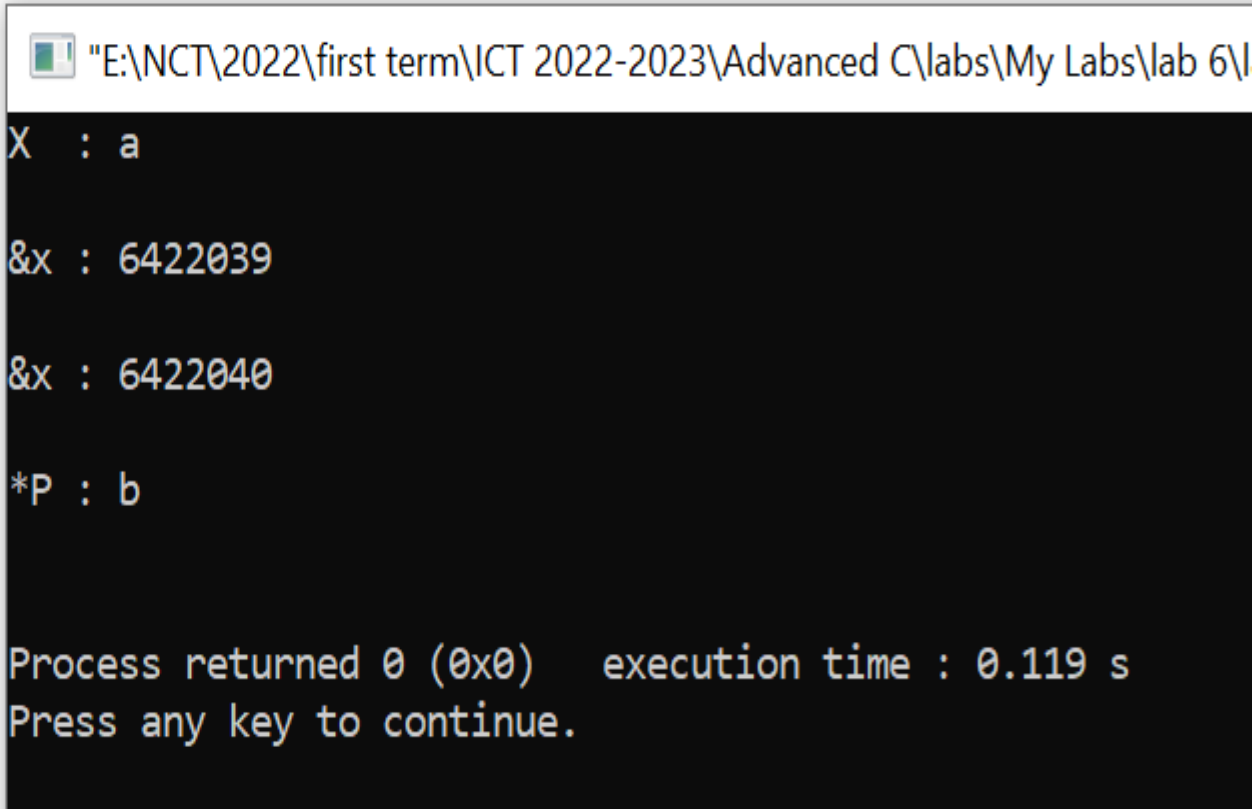
```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int x=5;
    printf("X   : %d\n\n",x);

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

    int *p=&x;

    printf("*P : %d\n\n",*p+1);
```

"E:\NCT\2022\first term\ICT 2022-2023\Advanced C\labs\My Labs\lab

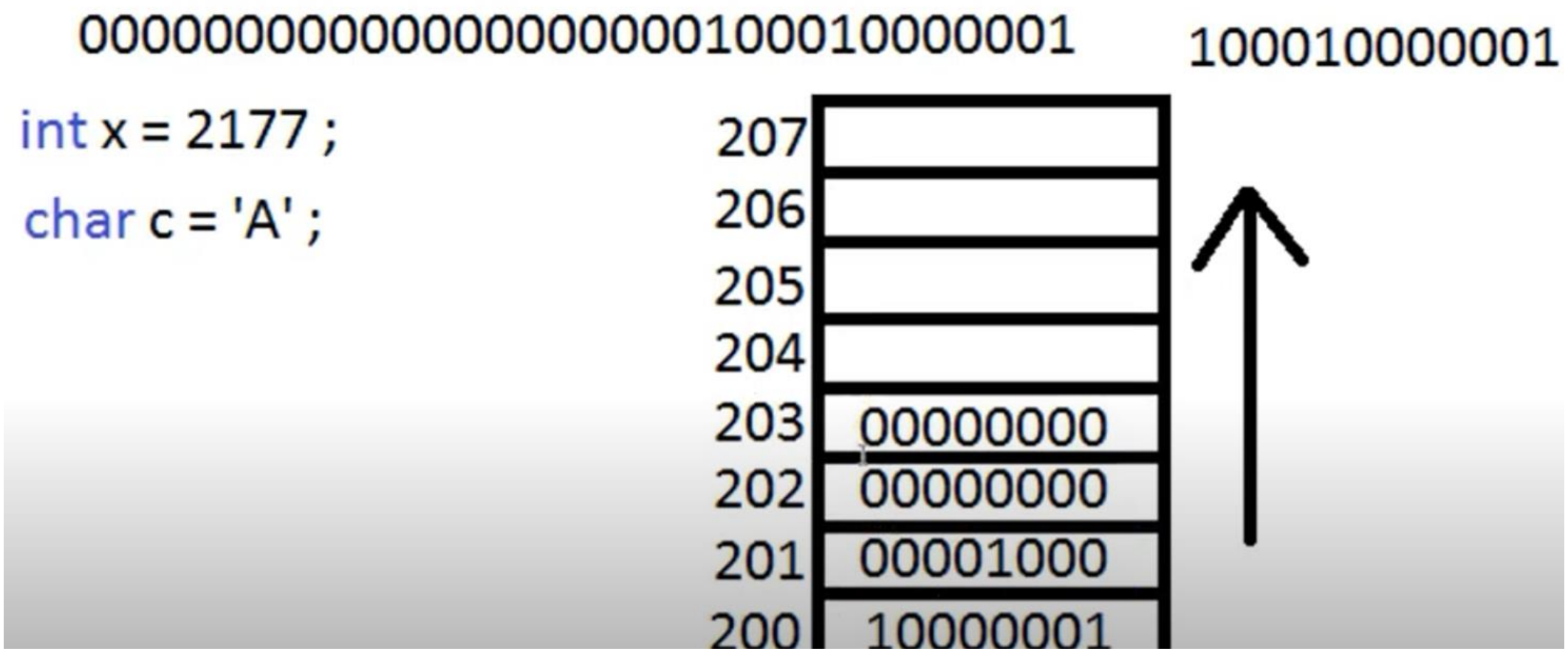
```
X   : 5

&x : 000000000061FE14

*P : 6


Process returned 0 (0x0)   execution time : 0.110 s
Press any key to continue.
```

pointers

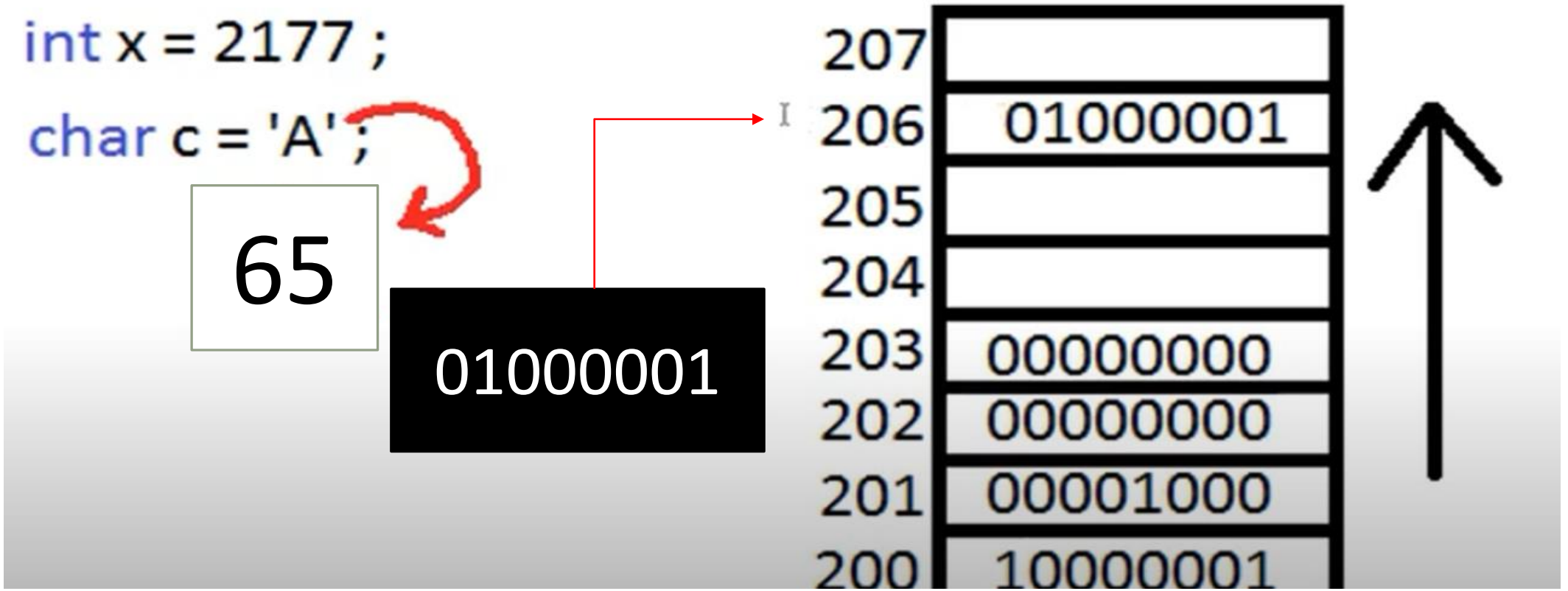
```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
    char x='a';
    printf("X  : %c\n\n",x);

    printf("&x : %i\n\n",&x);
    printf("&x : %i\n\n",&x+1);

    char *p=&x;

    printf("*P : %c\n\n",*p+1);
```



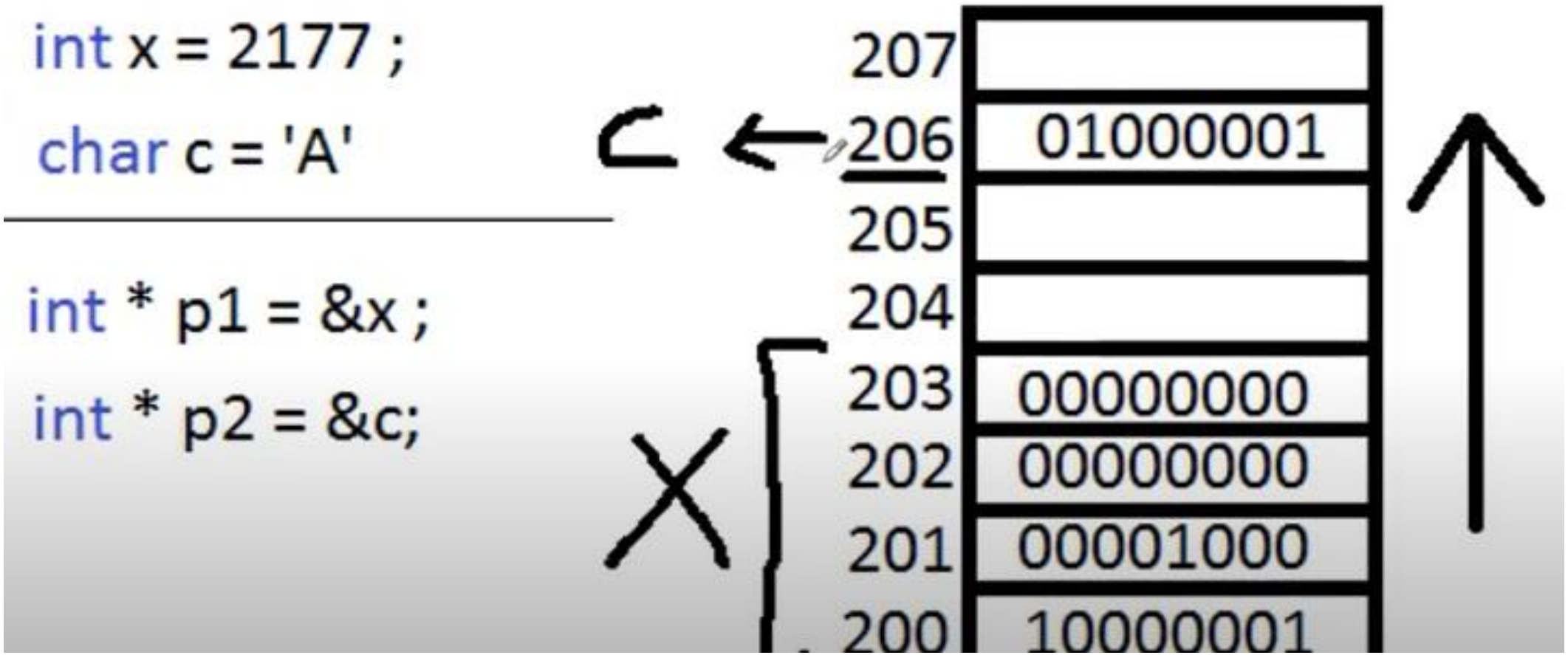
Memory


00000000000000000010010000001
10010000001
int x = 2177 ;
char c = 'A' ;
207
206
205
204
203
00000000
202
00000000
201
00001000
200
10000001

memory


int x = 2177 ;
char c = 'A';
65
01000001
207
206
01000001
205
204
203
00000000
202
00000000
201
00001000
200
10000001

Error


int x = 2177 ;
char c = 'A'
int * p1 = &x ;
int * p2 = &c;
207
206
205
204
203
202
201
200
01000001
00000000
00000000
00001000
10000001

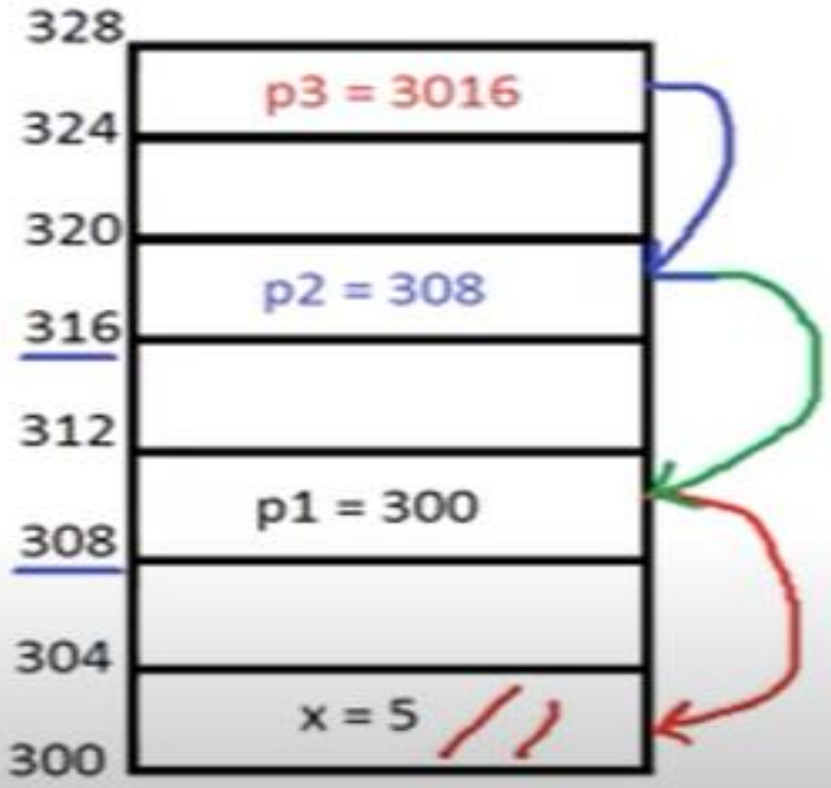
Memory

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

int main()
{
    printf("\n---------- int ------------\n\n");
    int x=2177;
    printf("X  : %d\n\n",x);
    printf("&x : %i\n\n",&x);
    printf("&x : %i\n\n",&x+1);

    int *p=&x;
    printf("*P : %d\n\n",*p+1);
```

```
---------- int ------------

X  : 2177

&x : 6422028

&x : 6422032

*P : 2178

---------- char ------------
```

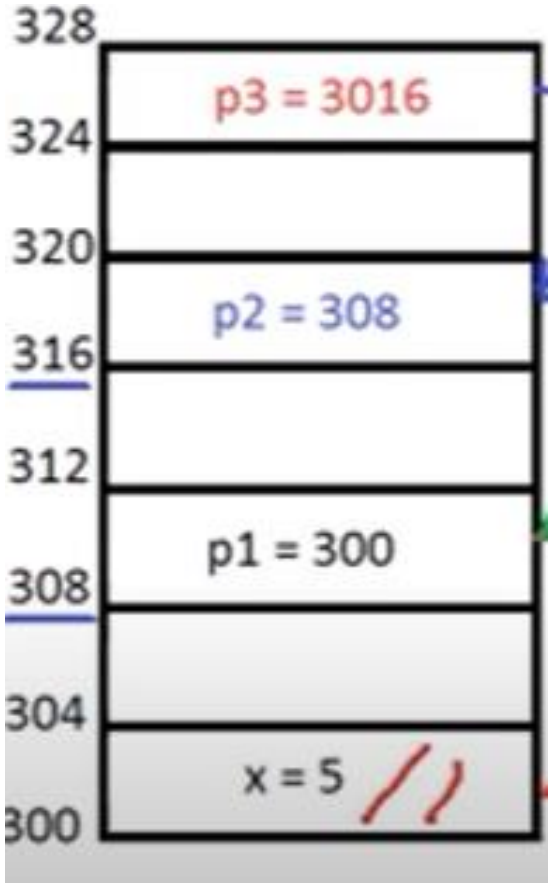
Pointer to pointer

```
int x = 5;    // Integer
int * p1 = &x;    // Pnt to Int
int ** p2 = &p1;  // Pnt to (Pnt to Int)
int *** p3 = &p2 // Pnt to ( Pnt to (Pnt to Int) )
```



Try

```
int x=5;
int *p1=&x;
int **p2=&p1;
int ***p3=&p2;
```



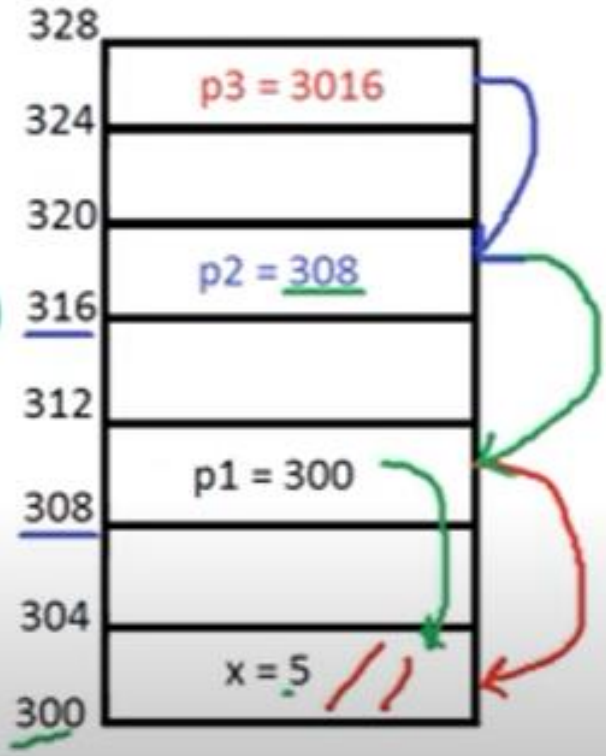
X →
P1 →
*p1 →
P2 →
*p2 →

p3 →
*p3 →
**p3 →
***p3 →

pointers

```
int x = 5;    // Integer
int * p1 = &x;    // Pnt to Int
int ** p2 = &p1;  // Pnt to (Pnt to Int)
int *** p3 = &p2 // Pnt to ( Pnt to (Pnt to Int) )
```

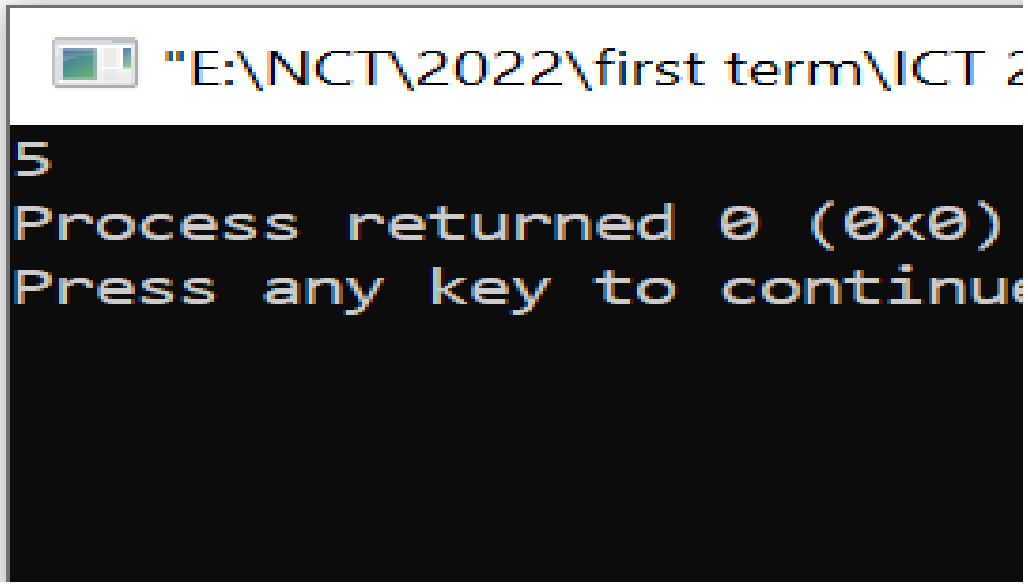
```
p3 -> 316
*p3-> 308
**p3 -> 300
***p3- > 5
```




```
printf/cout :
-----------------------------------
x  -> 5
 p1 -> 300
*p1 -> 5
 p2 -> 308
*p2 -> 300  //  *(300) = 5
```

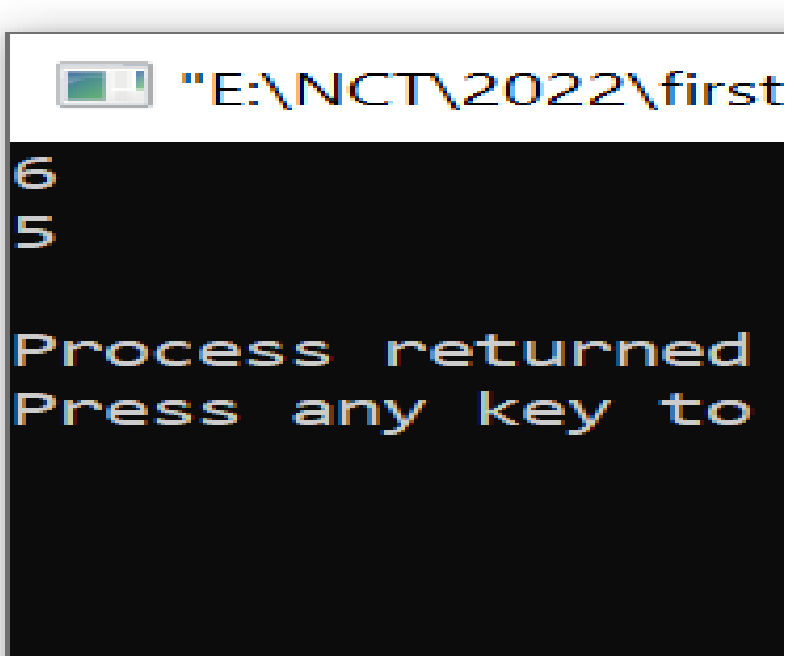
pointers

```
 1  #include <stdio.h>
 2  #include <stdlib.h>
 3  void increment(int x){
 4          x++;
 5     }
 6
 7  int main()
 8  {
 9
10     int x=5;
11     increment(x);
12     printf("%d",x);
13
14
```



Call by value

```
15  void increment(int x){
16          x+=1;
17          printf("%d\n",x);
18      }
19
20
21
22  int main()
23  {
24
25      int x=5;
26      increment(x);
27      printf("%d\n",x);
28
29
```



Call by value

```
 1  #include <stdio.h>
 2  #include <stdlib.h>
 3  void increment(int x){
 4          x++;
 5          printf("%p\n",&x);
 6     }
 7
 8  int main()
 9  {
10
11     int x=5;
12     increment(x);
13     printf("%d\n",x);
14     printf("%p\n",&x);
15
16
```

```
"E:\NCT\2022\first term\I
000000000061FDF0
5
000000000061FE1C

Process returned 0 (0x
Press any key to conti
```

Call By Reference

```
1   #include <stdio.h>
2   #include <stdlib.h>
3   void increment(int *x){
4           *x+=1;
5
6       }
7
8   int main()
9   {
10
11      int x=5;
12      increment(&x);
13      printf("%d\n",x);
14
15
```