Higher School of Applied Sciences of Tlemcen
1-year computer science course

Pointers

Part 1

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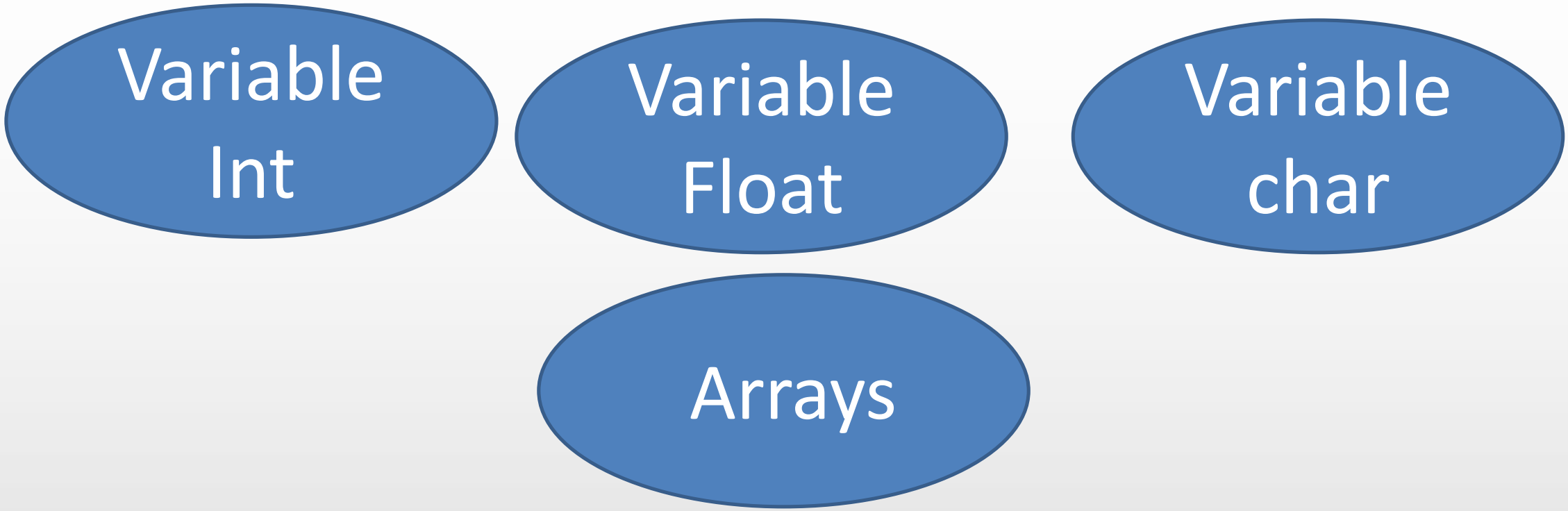
Part 1

Overview of Pointers

Definition

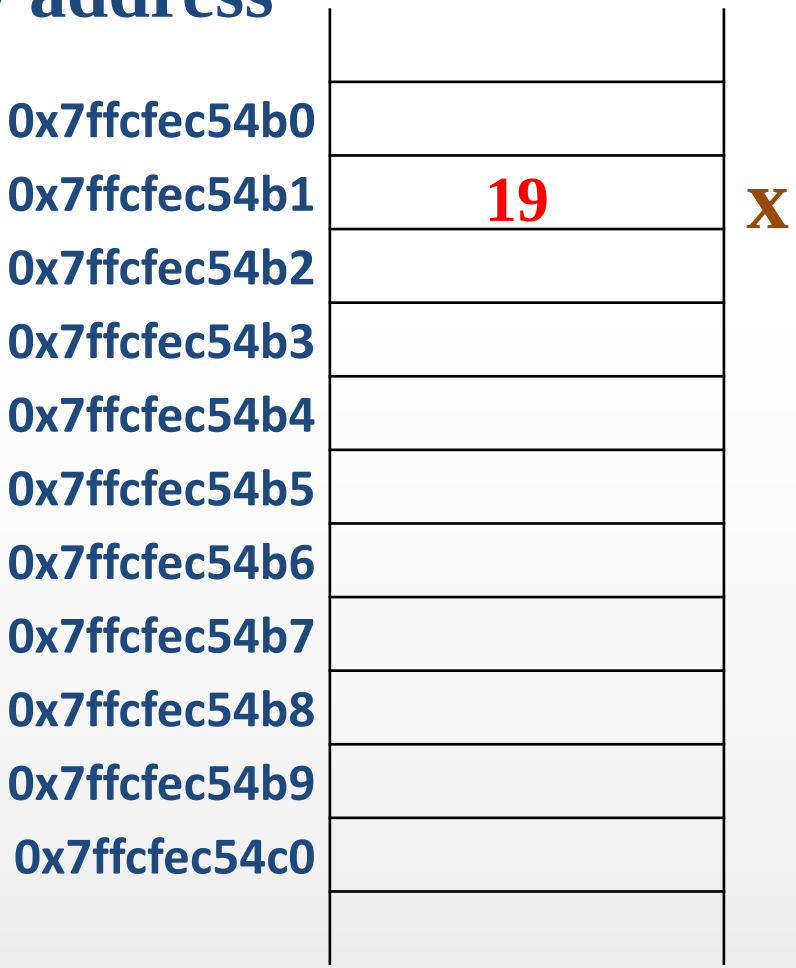
A pointer is a special type of variable that stores the memory address of another variable



Pointers and Integers

int x=19

The address of X is 0x7ffcfec54b1



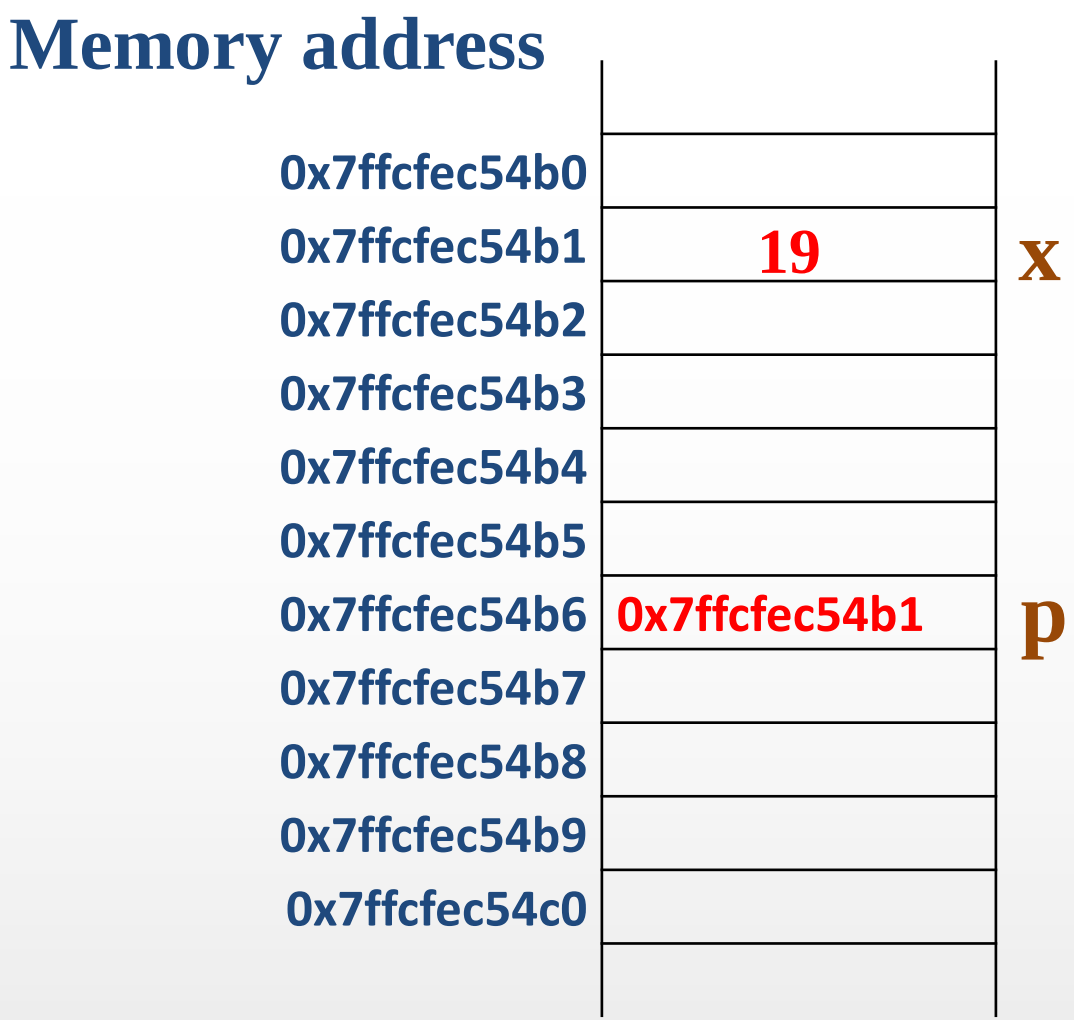
Pointers and Integers

int x=19

L'adresse de X est 0x7ffcfec54b1

int *p

P=&x ***p=19**



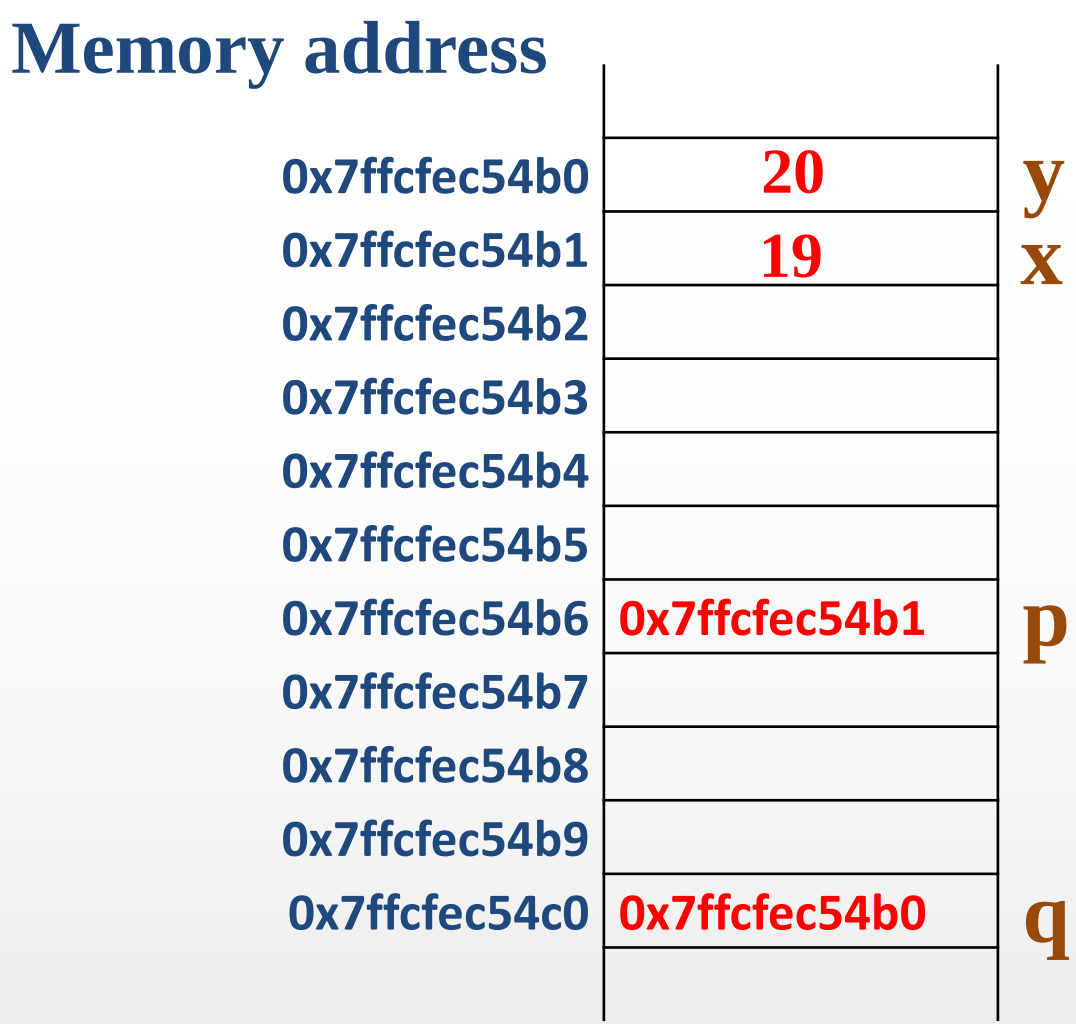
Pointers and Integers

```
int x=19

int y=20

int *p      int *q
p=&x        q=&y

*p=19       *q=20
```



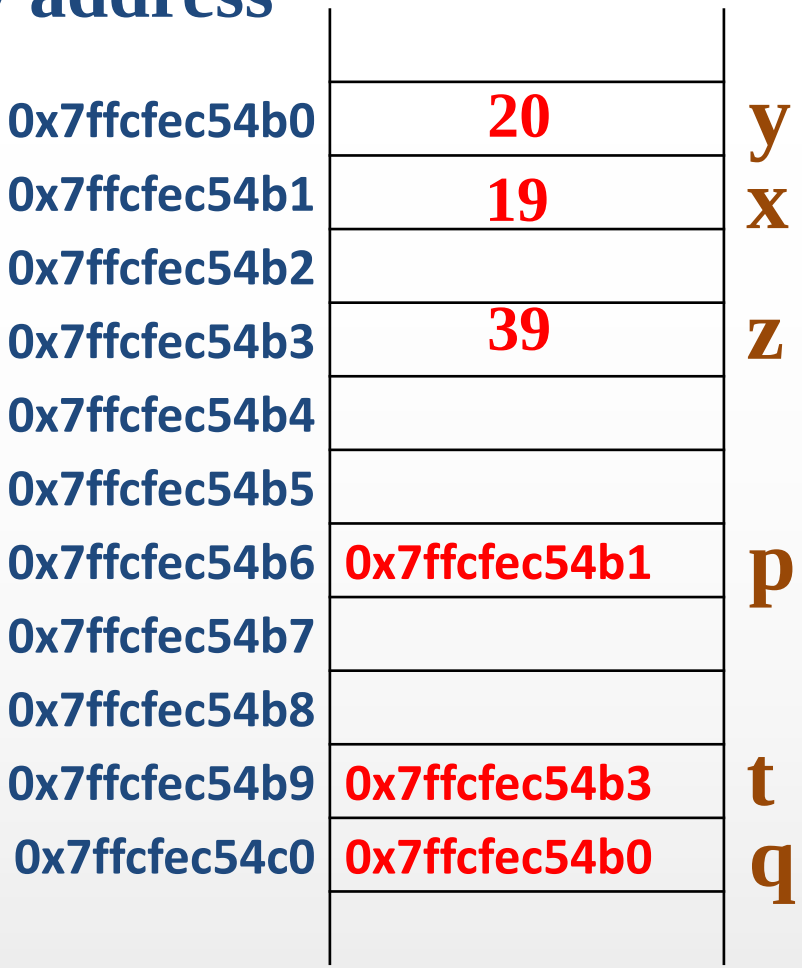
Pointers and Integers

```
int x=19
int y=20
int z
```

```
int *p      int *q      int *t
p=&x        q=&y        t=&z
```

```
*p=19       *q=20
```

```
*t=*p+*q=39
```



Pointers and Integers

```
printf("%d",x)
```

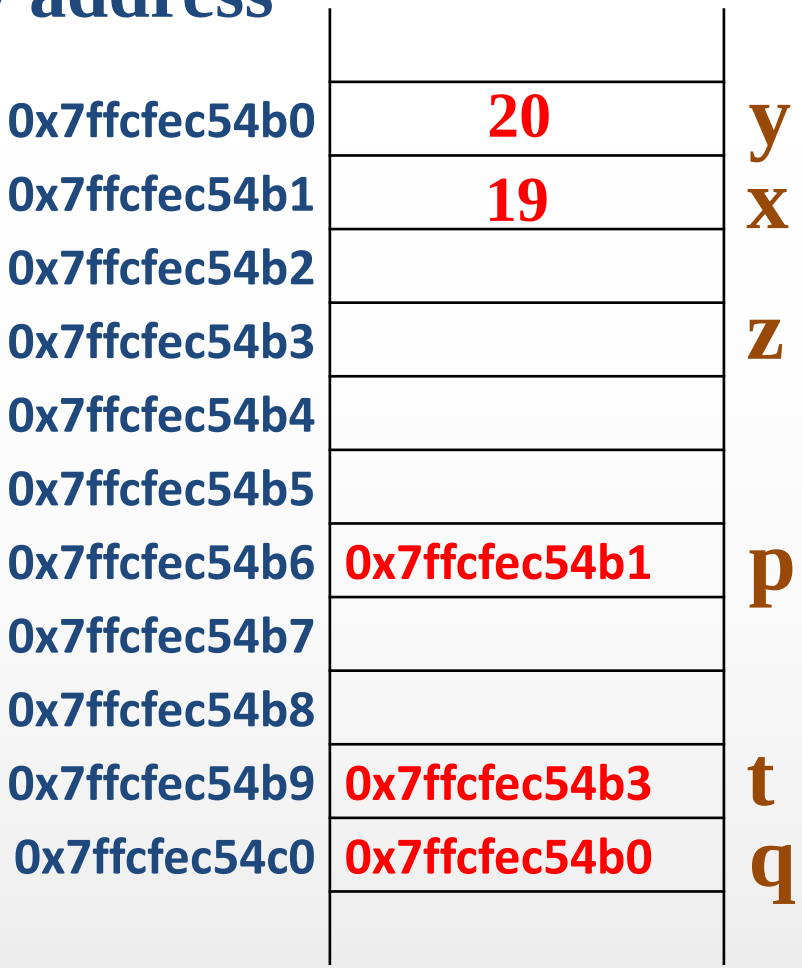
-> 19

```
printf("%d",*p)
```

-> 19

```
printf("%p",p)
```

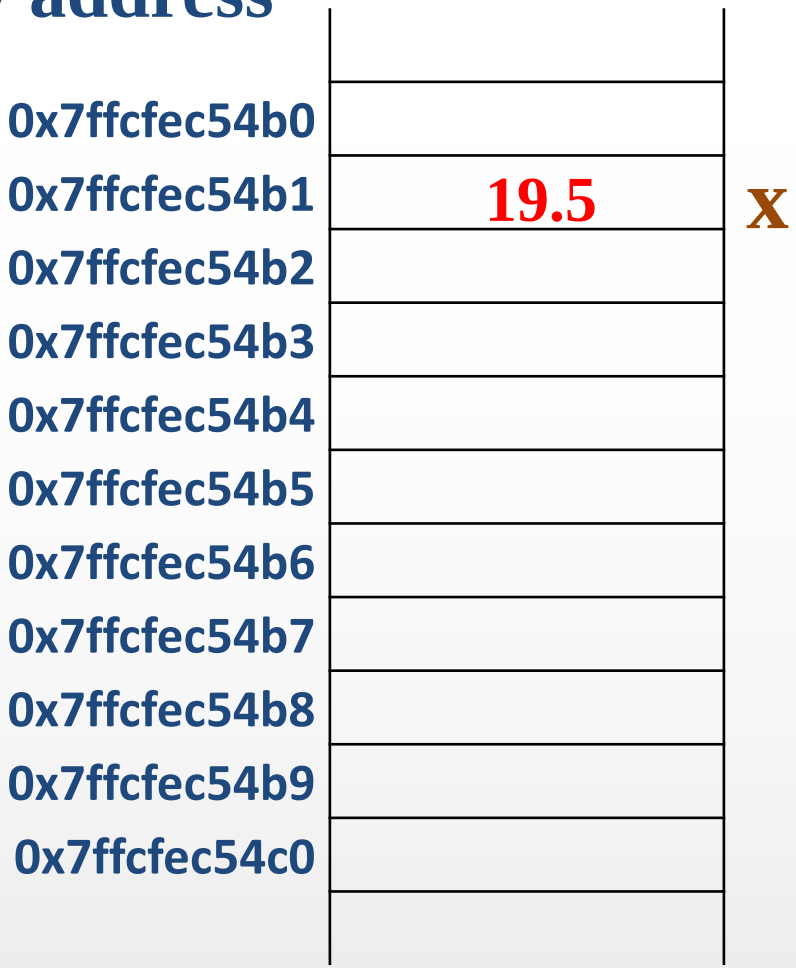
-> 0x7ffcfec54b1



Pointers and Floats

float x=19.5

L’adresse de X est 0x7ffcfec54b1



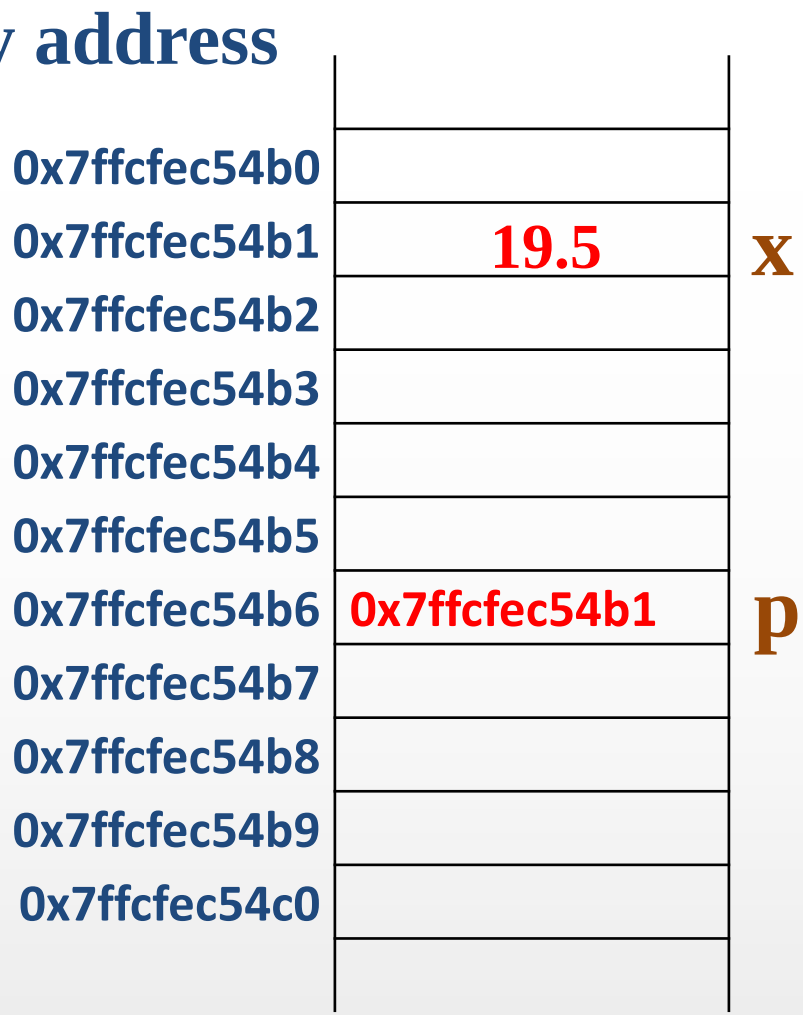
Pointers and Floats

float x=19.5

L'adresse de X est 0x7ffcfec54b1

float *p

P=&x ***p=19.5**



Pointers and Floats

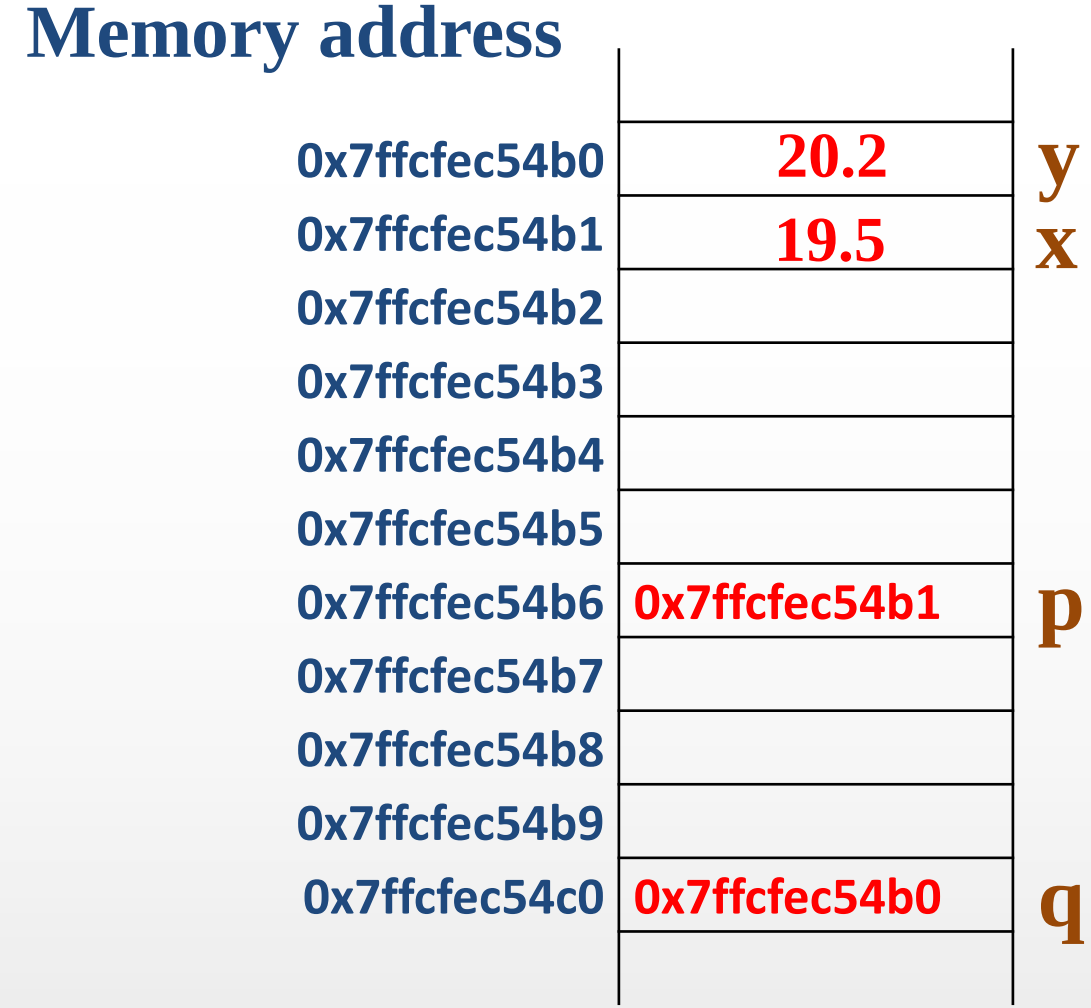
float x=19.5

float y=20.2

float *p **float *q**

p=&x **q=&y**

***p=19.5** ***q=20.2**



Pointers and Floats

float x=19.5

float y=20.2

float z

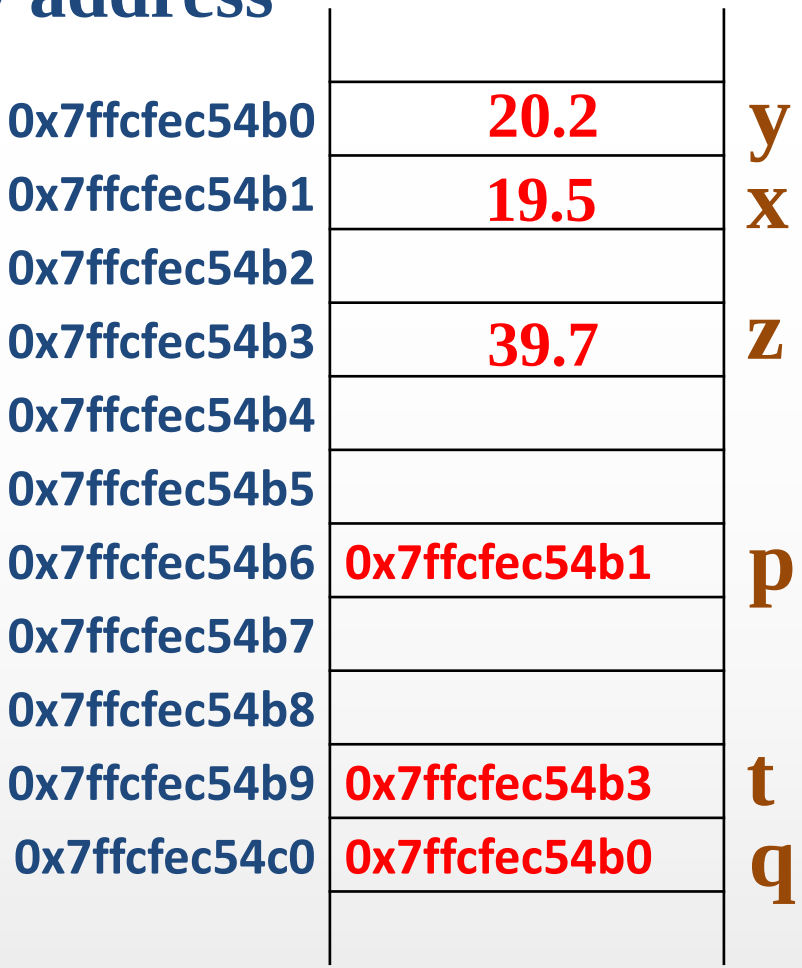
float *p **float *q** **float *t**

p=&x **q=&y** **t=&z**

***p=19.5** ***q=20.2**

***t=*p+*q=39.7**

Memory address



Pointers and Floats

```
printf("%f",x)
```

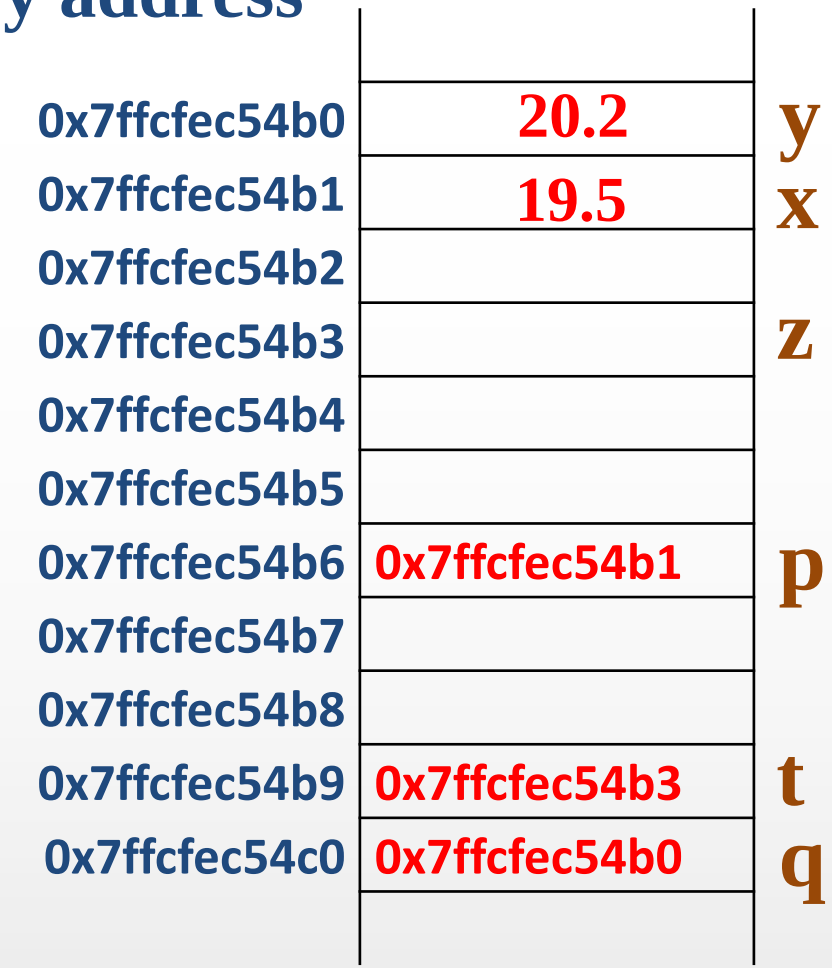
-> 19.5

```
printf("%f",*p)
```

-> 19.5

```
printf("%p",p)
```

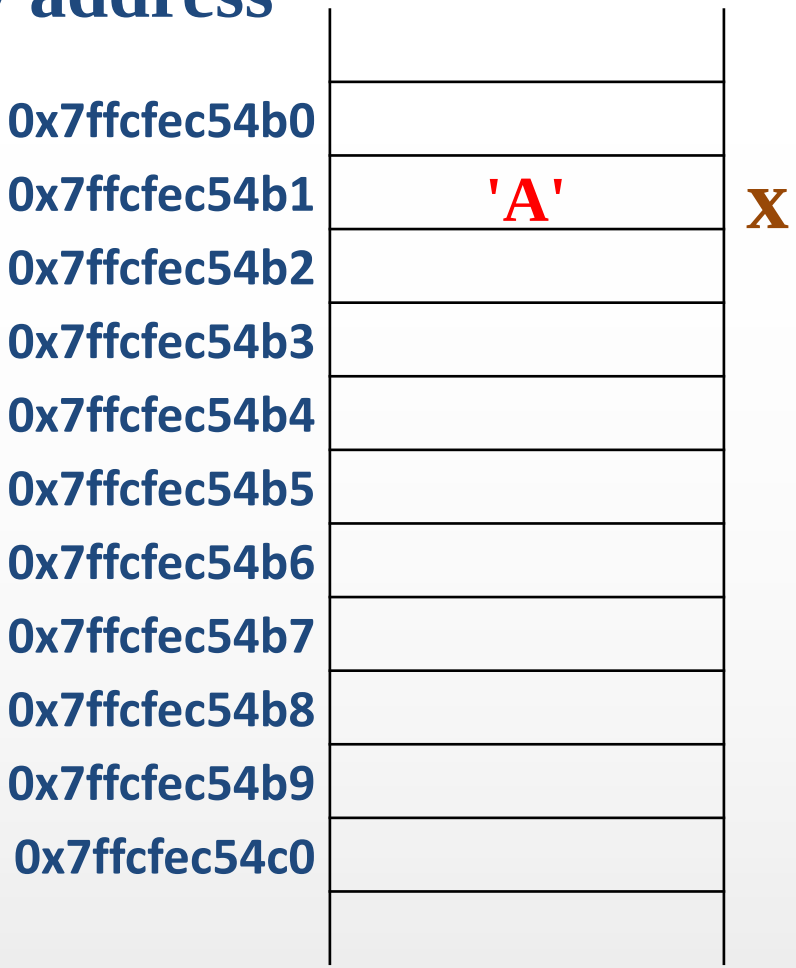
-> 0x7ffcfec54b1



Pointers and Characters

char x='A'

L’adresse de X est 0x7ffcfec54b1



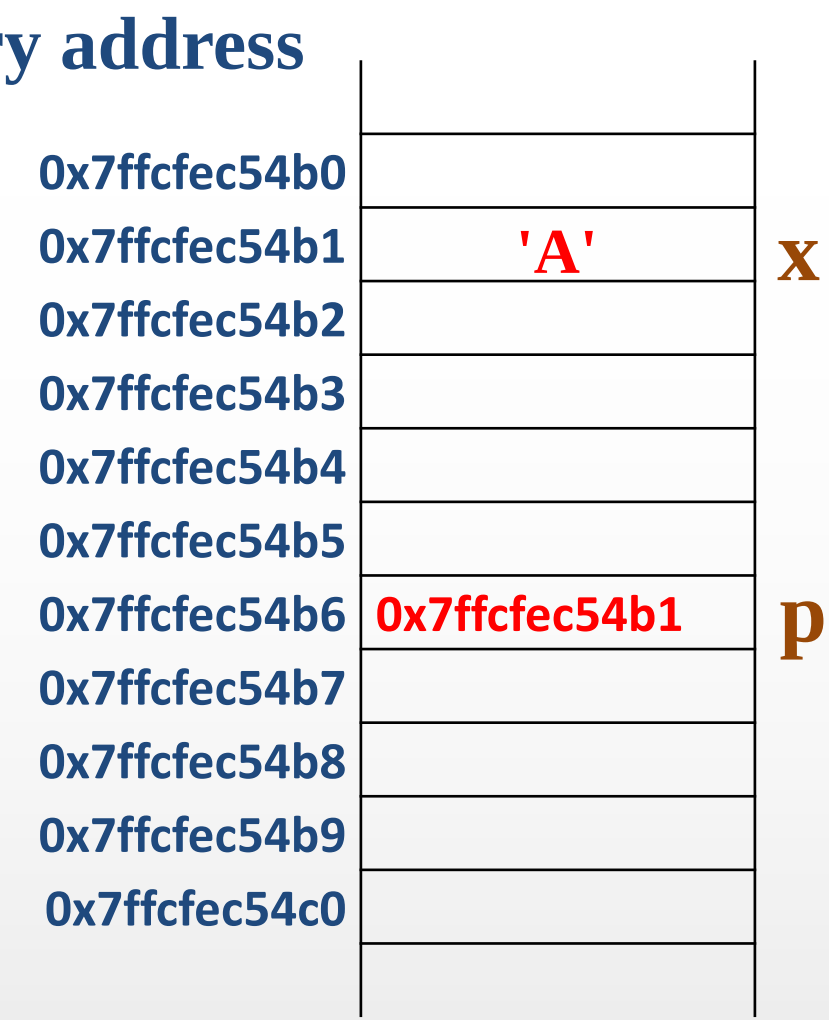
Pointers and Characters

char x='A'

L'adresse de X est 0x7ffcfec54b1

char *p

P=&x ***p= 'A'**



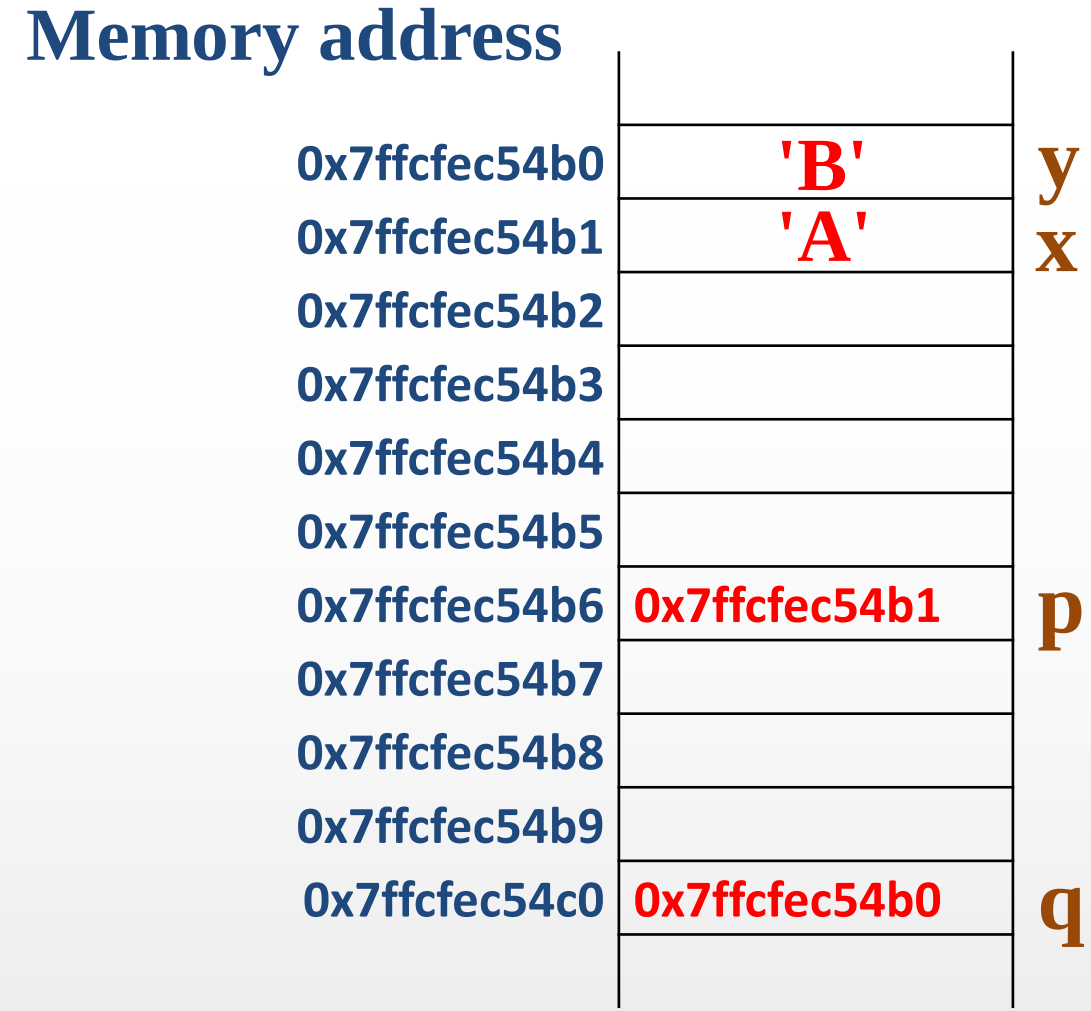
Pointers and Characters

```
char x='A'

char y= 'B'

char *p    char *q
p=&x       q=&y

*p= 'A'    *q= 'B'
```



Pointers and Characters

```
printf("%c",x)
```

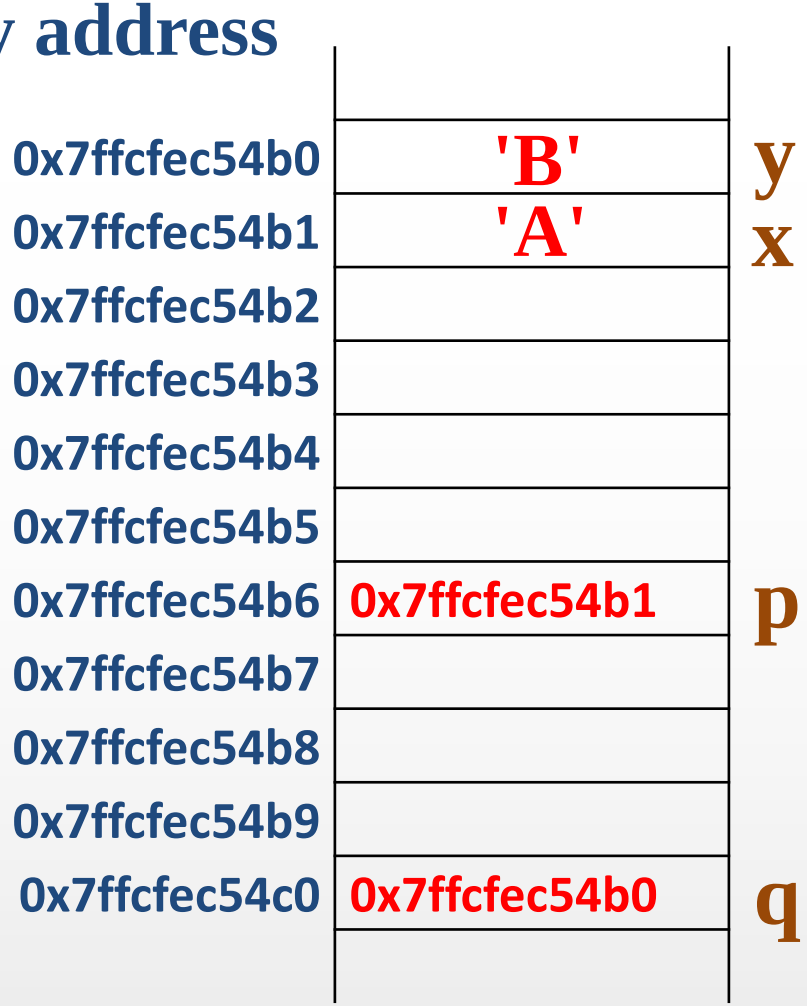
-> 'A'

```
printf("%c",*p)
```

-> 'A'

```
printf("%p",p)
```

-> 0x7ffcfec54b1



Pointers and Characters

Note:

Any modification to **x** will also modify ***P**, and vice versa

Pointers and Characters

Exercice 1

```
int myAge = 43;

          = &myAge;
```

Pointers and Characters

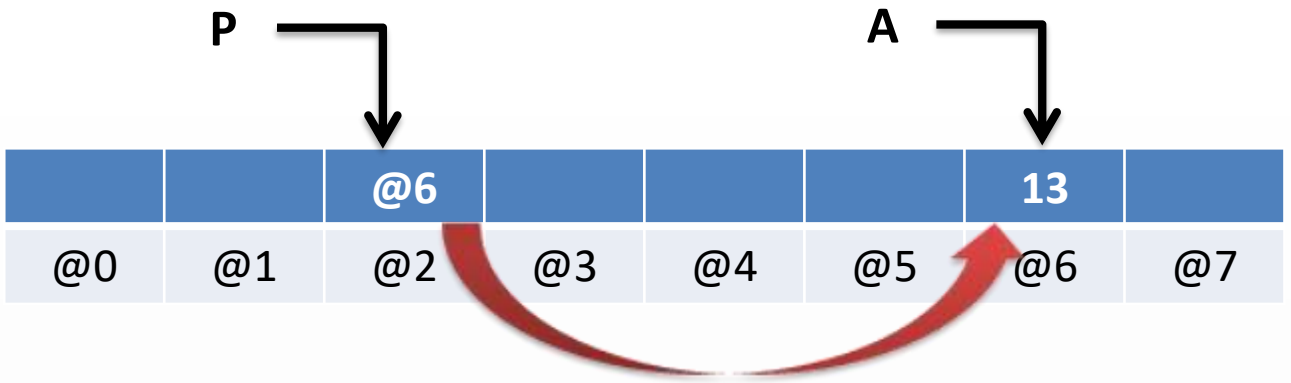
Exercice 2

What does the program display?

```
int myAge = 43;
int* ptr = &myAge;
printf("%d\n", myAge);
printf("%p\n", &myAge);
printf("%p\n", ptr);
```

Pointers and Characters

Exercice 3



Variable's name	Address	Value
A	@6	13
P	@2	@6
*P	@6	13

Pointers and Characters

Exercice 4

```
#include<stdio.h>
int i,j;
int *P1,*P2;
int main(){
i=2; j =5;
P1=&i; P2=&j;
(*P1)++;
*P2=*P1;
printf(" i=%d",i);
printf("j=%d",j);
printf(" *P1=%d",*P1);
printf(" *P2=%d",*P2);
return 0;}
```