

## Pointers in C / C++

- A pointer is a variable that stores a memory address.

```
int x = 8;
```

```
int *y;
```

```
y = &x;
```

H 0300

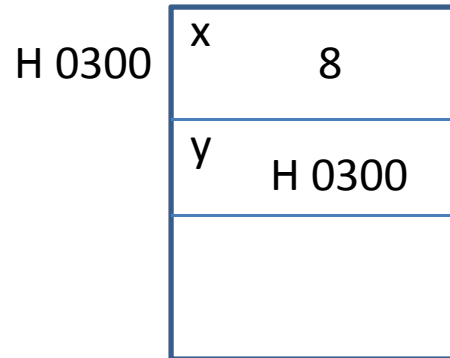
x	8
y	H 0300

The \* operator is used for definition and indirection.

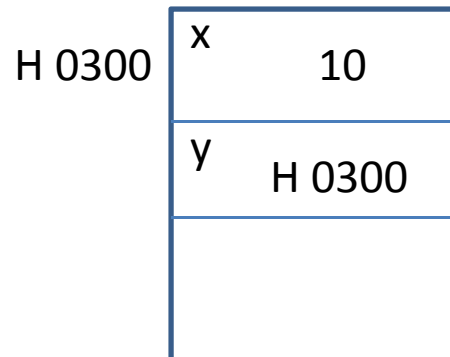
```
int x = 8;
```

```
int *y;
```

```
y = &x;
```



```
*y = 10;
```



It is valid to have a pointer to pointer.

```
int x = 8;
```

```
int *y;
```

```
y = &x;
```

```
int **z;
```

```
z = &y;
```

H 0300	x	8
H 0304	y	H 0300
	z	H 0304

Pointers are particularly useful as function parameters

Example (From MAT 233 notes):

```
#include <stdio.h>
void addOne(int *i) {
    *i += 1;
}

int main() {
    int x = 1;
    int *a;
    a = &x;
    addOne(a);
    printf("x: %d",x);
}
```

## Pointers and arrays

Declaring an array is declaring a pointer to its first element

```
int x[5];
```

```
int *y;
```

```
int *z;
```

```
int *q;
```

```
y = x;
```

```
z = &x[0];
```

```
q = &x[2];
```

