



# Pointers

Session#6



# Session's Agenda

1. What is a Pointer?
2. Working With Pointers
3. Pointer Types
4. Memory Structure
5. New and Delete Keywords
6. Pointers and Function Arguments
7. Pointers and Arrays
8. Pointers and Arrays and Functions
9. Multidimensional arrays with pointers
10. Function Pointer
11. Memory Leaks



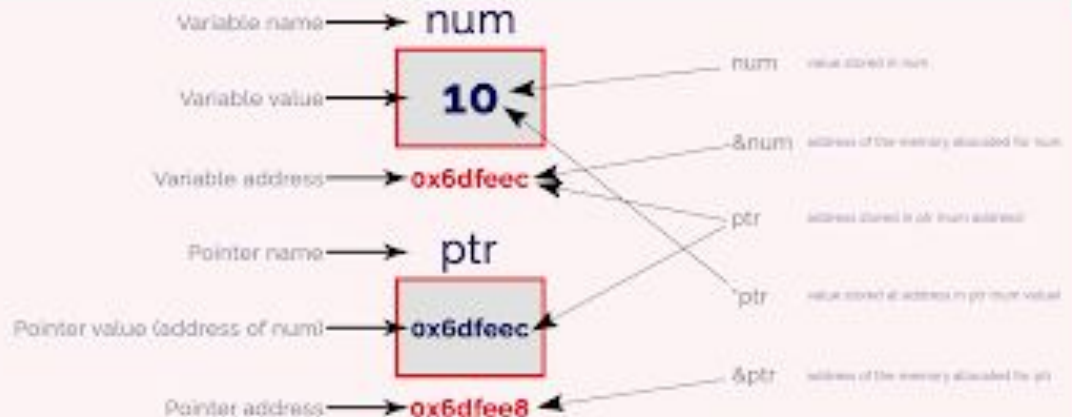
# What is a Pointer?

A pointer is a variable that stores the memory address of an object.

```
int = 10;
```

```
int *ptr;
```

```
ptr = &num;
```



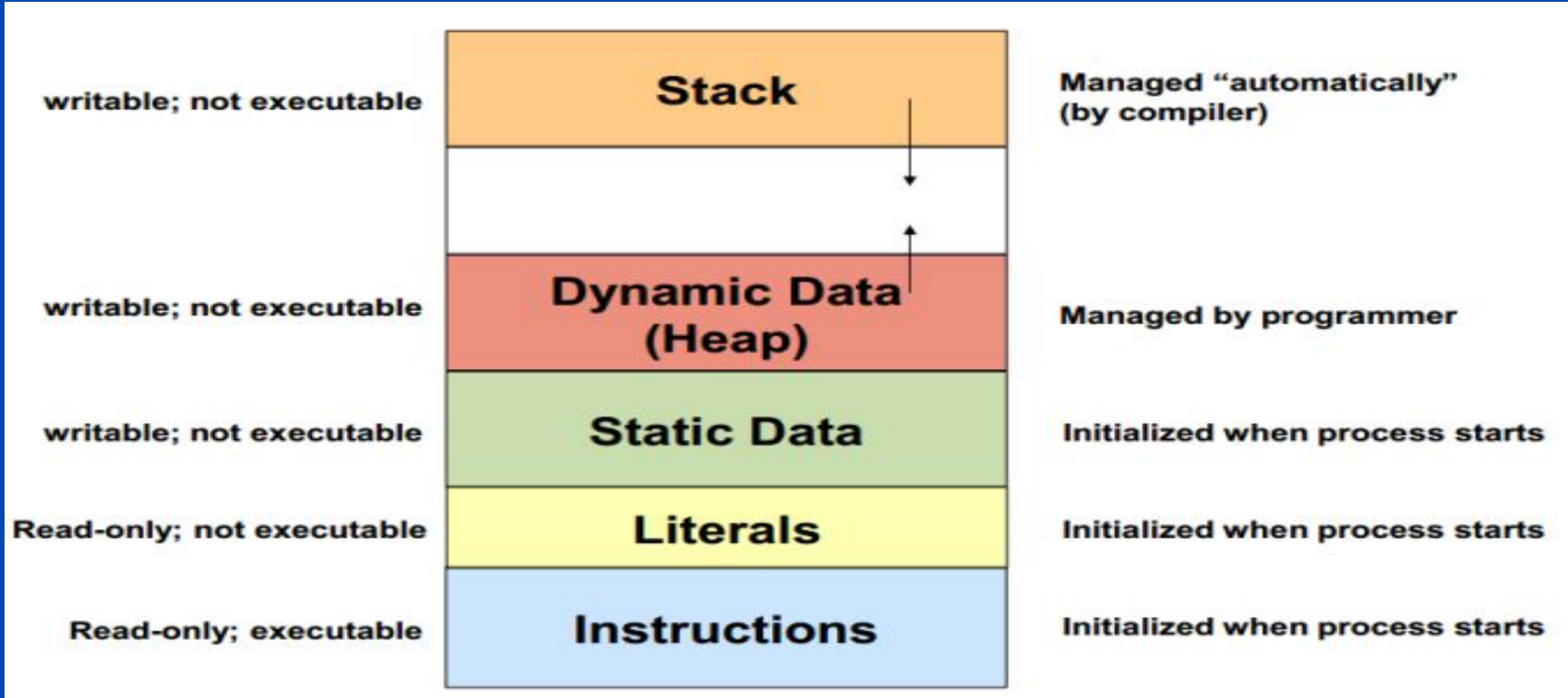


# Pointer Types

1. Integer Pointers
2. Array Pointer
3. Structure Pointer
4. Double Pointers/Pointer to Pointer
5. NULL Pointer
6. Void Pointer/generic pointers
7. Constant Pointers
8. Pointer to Constant
9. Function Pointers



# Memory Structure





# New and Delete Keywords

## New vs Delete

New	Delete
An operator in C++ that allocates memory for an object or an array of objects	An operator in C++ that deallocates a block of memory previously allocated for an object created using the new operator
Helps to allocate memory for an array or an object	Helps to deallocate the allocated memory to a particular object or an array

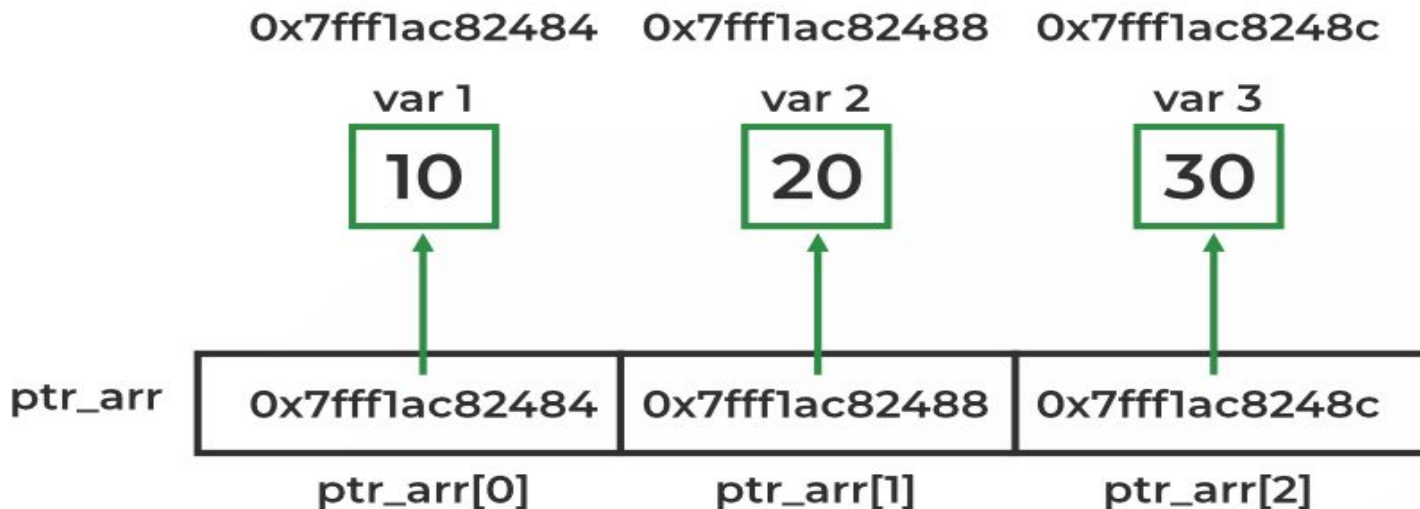


# Pointers and Functions

A pointer can be used as an argument in function declaration. When a function with a pointer argument is called, the calling program will pass the address(not the value) of a variable to the argument.



# Pointers and Arrays







# Multidimensional arrays with pointers

1	2	3
4	5	6
7	8	9

`matrix[3][3]`

`* (matrix + 0)`

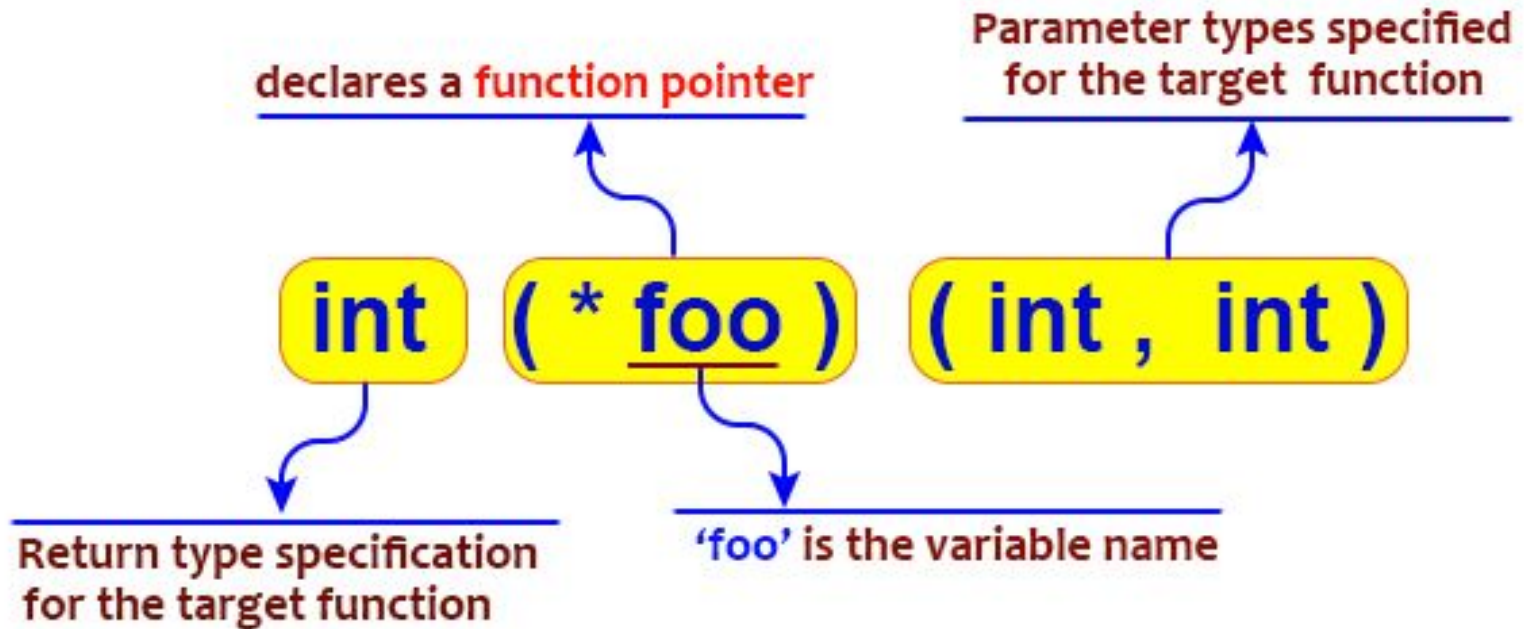
`* (matrix + 1)`

`* (matrix + 2)`

1	<code>* (* (matrix + 0) + 0)</code>
2	<code>* (* (matrix + 0) + 1)</code>
3	<code>* (* (matrix + 0) + 2)</code>
4	<code>* (* (matrix + 1) + 0)</code>
5	<code>* (* (matrix + 1) + 1)</code>
6	<code>* (* (matrix + 1) + 2)</code>
7	<code>* (* (matrix + 2) + 0)</code>
8	<code>* (* (matrix + 2) + 1)</code>
9	<code>* (* (matrix + 2) + 2)</code>



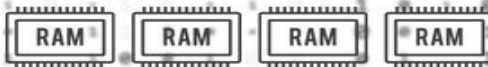
# Function Pointer





# Memory Leaks

## Memory Leak





# More Reading

[C Pointers](#)

[C Pointers 2](#)

[Malloc, calloc, free, realloc](#)

[Pointers To Pointers](#)

[Computer Memory](#)

[What is memory leak how can we avoid](#)