Functions

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Robotics 2A

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June 28, 2021

Functions

A function is a group of statements that together perform a task. Every C program has at least one function, which is *main()*, and all the most trivial programs can define additional functions (Tutorials Point). A function declaration tells the compiler about function's name, return type, and parameters. A function definition provides the actual body of the function.

Once knowing this information, the specific functions to cover are malloc, realloc, calloc, and free.

Malloc

According to GeeksforGeeks portal, malloc is an acronym for "memory allocation" which returns pointer of type void that can be cast into a pointer of any form. The method is used to dynamically allocate a single large block of memory in a specified size

The syntax of a malloc function is:

Ptr = (cast-type) malloc (byte-size);*

In other words,

Ptr = (int) malloc (100* sizeof(int));*

The function means if the size of int is 4 bytes, then the statement will allocate 400 bytes of memory. And the pointer ptr holds the address od the first byte allocated in the memory.

Realloc

To begin with, realloc means "re-allocation" that changes the memory allocation of a previously allocated memory. In other words, if the memory previously allocated with the help of malloc or calloc is insufficient, realloc can be used to re-allocate the memory, maintaining the value and new blocks will be initialized with default garbage value. The syntax is:

Ptr = realloc (ptr, newSize);

where ptr is reallocated with new size 'newSize'.

Calloc

On the other hand, calloc means “contiguous allocation” which provides the initialization in each block with a default value ‘0’. Calloc returns a pointer to the allocated space (Microsoft). The storage space pointed to by the return value is guaranteed to be suitable aligned for storage of any type of object. The syntax of calloc is:

Ptr = (cast-type) calloc (n, element-size);*

Then, the example is:

Ptr = (float) calloc (25, sizeof(float));*

In this case, the statement allocates contiguous space in memory of 25 elements each with the size of the float.

Free

Free is to de-allocate the memory. The memory allocated using functions malloc and calloc is not de-allocate on their own. Hence the free method is used, whenever the dynamic memory allocation takes place. It helps to reduce wastage of memory by freeing it. The syntax is simply *free(ptr);*.

References

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