

Difference Between Garbage Collector and Destructor

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Key Difference - Garbage Collector vs Destructor

Most [programming languages](#) support [Object Oriented Programming](#). It is a methodology to build a program or [software](#) using [objects](#). An object is created using a class, so it is an instance of a class. A class provides the description of what the object should consist of. When creating objects, memory is allocated for the objects. The allocated memory should be released at the end of the program execution to reuse that memory for some other object. Programming languages such as [Java](#) and [C#.NET](#) use garbage collectors for memory management while languages such as [C](#) and [C++](#) require the programmer to handle memory management. The necessary amount of memory should be allocated, and at the end of the execution, the memory should be released. The Garbage collector and destructor are used for releasing memory. The **key difference** between the garbage collector and destructor is that **a garbage collector is a software that performs automatic memory management while a destructor is a special method called by the garbage collector during the destruction of the object.**

What is a Garbage Collector?

Some programming languages have managed code environments. In programming languages Java, C# automatic memory management is performed. The programmer does not need to free up the memory used by the objects. It is easier for them to develop even complex systems because the memory management is done automatically. In programming languages such C, C++ and Objective C, the program should release the memory of the objects back to the system. Languages such as Java and C# can figure out the objects that are no longer used. Afterwards, they release the memory allocated for those objects back to the system.

In programming languages C# and Java, if there is a class called Student, then an object can be created using `Student s = new Student ();` The 'new' is used to create an instance of Student class. It allocates memory in the system. The 's' is referring to the memory block allocated for that object. The language environments identify whether the objects are being used or not. If they are not used further, then the memory is released and can be used later.



Figure 01: Garbage Collector and Destructor

When running a program, the blocks of memory is allocated from the system memory pool. Then the program performs the tasks using that memory. When the program execution is over, the garbage collector figures out whether the allocated blocks of memory for the program is essential or not. If they are not required, those memory blocks are returned to the system. So, the garbage collector can track the created objects in the program. The memory blocks that are no longer required are sent back to the system memory pool. The main advantage of this process is to confirm that the programmer does not have to concentrate on the memory deallocation. It balances the performance and memory usage.

What is a Destructor?

A destructor is a special member function of a class. It is invoked whenever the object goes out of the scope. The object can be destroyed when a function ends or at the end of the program execution. The destructor has the same name as the class name. The constructor is used to create the object. It can accept parameters. The constructor can also have return values. But in a Destructor, there is no return type or accepting parameters. A class can only consist of one destructor. A destructor is referred using the tilde sign. If the class name is Student, then the destructor is `~Student () {}`.

The garbage collector looks for the objects that are not required anymore. It ensures that the objects which are no longer used by the program should be destroyed. It calls the destructor to release the memory and to deallocate the resources. Destructors are useful to release memory, close files, release network resources and to close database connections. In most programming languages, it is not necessary to write the destructor because the garbage collector calls the default constructor on its own. If the programmer has done any dynamic memory allocation using pointers in a language like C++, then he should write a destructor to release memory before the object is destroyed.

What is the Similarity Between Garbage Collector and Destructor?

- Both Garbage Collector and Destructor are used to release memory which is no longer required for the program.

What is the Difference Between Garbage Collector and Destructor?

Garbage Collector vs Destructor	
A garbage collector is a software that performs automatic memory management.	A destructor is a special method called by the garbage collector during the destruction of the object.
Type	
A garbage collector is a software.	A destructor is a method.

Summary - Garbage Collector vs Destructor

Garbage collector and destructor are two terms associated with releasing memory. This article discussed the difference between Garbage Collector and destructor. The difference between the garbage collector and destructor is that a garbage collector is a software that performs automatic memory management while a destructor is a special method called by the garbage collector during the destruction of the object.

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