**The return value of main.**

You may have noticed that the return type of *main* is *int*, but most examples in this and earlier chapters did not actually return any value from *main*.

Well, there is a catch: If the execution of *main* ends normally without encountering a *return* statement the compiler assumes the function ends with an implicit *return* statement:

|  |  |  |
| --- | --- | --- |
|  | return 0; |  |

Note that this only applies to function *main* for historical reasons. All other functions with a *return* *type* shall end with a proper *return* statement that includes a *return* *value*, even if this is never used.

When *main* returns zero (either *implicitly* or *explicitly*), it is interpreted by the environment as that the program ended successfully. Other values may be returned by *main*, and some environments give access to that value to the caller in some way, although this behavior is not required nor necessarily portable between platforms. The values for main that are guaranteed to be interpreted in the same way on all platforms are:

|  |  |
| --- | --- |
| **value** | **description** |
| 0 | The program was successful |
| [EXIT\_SUCCESS](https://cplusplus.com/EXIT_SUCCESS) | The program was successful (same as above). This value is defined in header [<cstdlib>](https://cplusplus.com/%3Ccstdlib%3E). |
| [EXIT\_FAILURE](https://cplusplus.com/EXIT_FAILURE) | The program failed. This value is defined in header [<cstdlib>](https://cplusplus.com/%3Ccstdlib%3E). |

Because the implicit *return 0*; statement for *main* is a tricky exception, some authors consider it good practice to explicitly write the statement.

|  |  |  |  |
| --- | --- | --- | --- |
| 1 2 3 4 5 6 7 8 | #include<iostream>  using namespace std;  int main()  {  cout << "Hello World" << endl;  system("pause");  return 0;  } | Hello World | [Edit & Run](https://cplusplus.com/doc/tutorial/control/) |

Below program is the same as above, however, there instead *return 0* nothing is written or on the last two programs other return values are used, namely *EXIT\_SUCCESS* and *EXIT\_FAILURE*.

|  |  |  |  |
| --- | --- | --- | --- |
| 1 2 3 4 5 6 7 | #include<iostream>  using namespace std;  int main()  {  cout << "Hello World" << endl;  system("pause");  } | Hello World | [Edit & Run](https://cplusplus.com/doc/tutorial/control/) |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 2 3 4 5 6 7 8 9 | #include<iostream>  #include<cstdlib>  using namespace std;  int main()  {  cout << "Hello World" << endl;  system("pause");  return EXIT\_ SUCCESS;  } | Hello World | [Edit & Run](https://cplusplus.com/doc/tutorial/control/) |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 2 3 4 5 6 7 8 9 | #include<iostream>  #include<cstdlib>  using namespace std;  int main()  {  cout << "Hello World" << endl;  system("pause");  return EXIT\_FAILURE;  } | Hello World | [Edit & Run](https://cplusplus.com/doc/tutorial/control/) |

While using *EXIT\_FAILURE* and *EXIT\_SUCCESS* *#include<cstdlib>* is required as a library. However, in MS Visual Studio it mayn’t be required.