

# A Bugs of C Programming

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**Abstract-** A bug is an error in a computer program that causes it to behave unexpectedly or produce incorrect results. The focus of this study is on detecting, analyzing, and fixing of c programming bugs. The process of finding bugs -- before users do -- is called debugging. Debugging starts after the code is written and continues in stages as code is combined with other units of programming to form a software product, such as an operating system or an application. This research paper is about details explanation about the bug which mostly occurs while doing c programming.

Index Terms-programs, bugs, types, error

## I. INTRODUCTION

In this ABC: A Bugs of C programming paper more common bugs are going to explained ,and steps are also given how to fix bugs. A bug is just one kind of problem that a program can have. Programs can run bug-free and still be difficult to use or fail in some major objective. There are mainly five types of errors exist in C programming:

- Syntax error
- Run-time error
- Linker error
- Logical error
- Semantic error

### Case 1: Syntax Error

Syntax errors are also known as the compilation errors as they occurred at the compilation time, or we can say that the syntax errors are thrown by the compilers.

If we want to declare the variable of type integer

`int a; //this is the correct form`

`INt a; //this is the incorrect form`

### Case 2: Syntax Error

Let's understand through an example.

- `#include <stdio.h>`
- `int main()`
- `{`
- `a = 10;`
- `printf("The value of a is : %d", a);`
- `return 0;`
- `}`



Figure 1: Syntax error

In the above output, we observe that the code throws the error that 'a' is undeclared. This error is nothing but the syntax error only. We have to declare variable a first like this `int a;`

### Case 3: Run-time error

Let's understand through an example.

Sometimes the errors exist during the execution-time even after the successful compilation known as run-time errors.

- `#include <stdio.h>`
- `int main()`
- `{`
- `int a=2;`
- `int b=2/0;`
- `printf("The value of b is : %d", b);`
- `return 0;`
- `}`

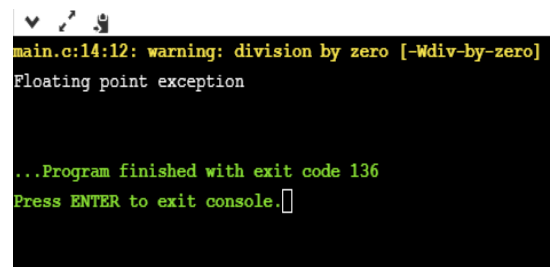


Figure 2: Run time Error

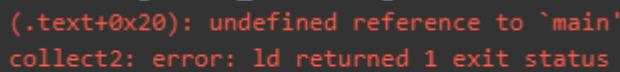
In the above output, we observe that the code shows the run-time error, i.e., division by zero.

#### Case 4: Linker Error

Let's understand through an example.

Linker errors are mainly generated when the executable file of the program is not created.

- #include <stdio.h>
- int Main()
- {
- int a=78;
- printf("The value of a is : %d", a);
- return 0;
- }



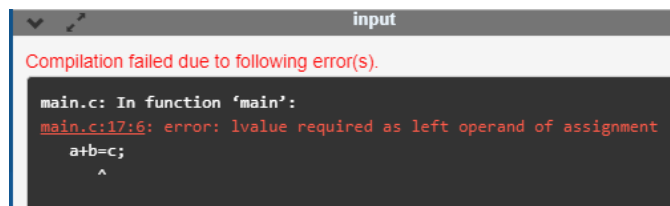
```
(.text+0x20): undefined reference to `main'  
collect2: error: ld returned 1 exit status
```

Figure 3: Linked Error

#### Case 5: Semantic error

Semantic errors are the errors that occurred when the statements are not understandable by the compiler. Let's understand through an example.

- #include <stdio.h>
- int main()
- {
- int a,b,c;
- a=2;
- b=3;
- c=1;
- a+b=c; // semantic error
- return 0;
- }



```
input  
Compilation failed due to following error(s).  
main.c: In function 'main':  
main.c:17:6: error: lvalue required as left operand of assignment  
a+b=c;  
  ^
```

Figure 4: Semantic error

## II. CONCLUSION

The process of finding bugs -- before users do -- is called debugging. Debugging starts after the code is written and continues in stages as code is combined with other units of programming to form a software product, such as an operating system or an application.

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