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Introduction to Types of Errors in C

Errors in C language is defined as an illegal operation performed by the user which will

the abnormal or abrupt working of the program logic. Programming errors are unidentified until

the program is compiled or executed. Some of the errors in C are hidden or prevent the program

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executing the application.

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- Before compilation, we will eliminate all error issues.

Types of Errors in C

C language broadly classified errors into 5 types. They are

Linker Errors

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1. Syntax Errors

Errors occur when you violate the rules of writing C syntax is said to be "Syntax errors". This compiler error indicates that this must be fixed before the code will be compiled. These errors are identified by the compiler so these errors are called "compile-time errors".

Syntax:

```
a. void main()
{
int a //here semi colon(;)missed
}
b. void main()
{
int a;
//here parenthesis(}) missed
```

2. Run-Time Errors

Errors which are occurred after a successful compilation of program is said to be "run-t[...] errors". Number divisible by zero, array index out of bounds, string index out of bounds, etc. are most frequent run-time errors. These errors can't be very hard to detect at the compile time.

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Syntax:

```
a. void main()
{
int a=10;
int c=a/0;// Here number divisible zero error occurs
}

b. void main()
{
int a[3]={1,2,3};
```

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These errors are generated after compilation we link the different object files with the main's object using the Ctrl+F9 short cut key. These errors occurred when the executable program cannot be generated. This may be due occurred because of wrong function declaration, importing incorrect header files, etc. Most frequent linkererror is writing Main() instead of a main() method.

Syntax:

```
void Main() // Here Main() method used instead of main() method
{
}
```

4. Logical Errors

If our expectation is one thing and result output is other thing then that kind of error we said it as "Logical errors". Let suppose if we want sum of the 2 numbers but given output is the multiplication of 2 numbers then this said to be Logical error. It can be detected by line by line debugging.

Syntax:

```
void Main()
{
printf("%d",sum(10,20));
}
int sum(int a, int b)
{
```

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This error generated if and only if written code is not understandable format to the C compiler.

Syntax:

```
void main()
{
int x, y, z;
x + y = z; //semantic error }
```

Examples of Types of Errors in C

Following are the examples are give below:

1. Syntax Error with Semicolon Example

Code:

```
#include<stdio.h> //Used to include basic c library files
void main() //Used to execute the C application
{
//declaring and defining the variables
int x = 10;
int y = 15;


//displaying the output
printf("%d", (x, y)) //Here semi-colon missed
}
```

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2. Syntax Error with Mustache Brace Example

Code:

```c
#include<stdio.h> //Used to include basic c library files
void main() //Used to execute the C application
{
//declaring and defining the variables
int a = 100;
int b = 105;
//displaying the output
printf("%d %d",a,b);
//Here mustache brace missed
```

Output:

3. Run-Time Errors with Array Index out of Bounds Exam

Code:

```c
#include<stdio.h> //Used to include basic c library files
```

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```
int b[5] = {105,106,107,108,109};
//displaying the output
printf("%d\n",a[100]); //array index out of bounds run-time error
//in c this is not shown any error message it will just show out
of bound values as 0
printf("%d\n",b[700]);//array index out of bounds run-time error
}
```

Output:

4. Run Time Error with Zero Divisible by Number Example

Code:

```
#include<stdio.h> //Used to include basic c library files
void main() //Used to execute the C application
{
//declaring and defining the variables
int x = 200;
int y = 400;
int a=x/10;
```

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}

Output:

5. Linker Error with Wrong Main() Method Syntax Example

Code:

```
#include<stdio.h> //Used to include basic c library files
void Main() //Linker error as wrong syntax of main method used
{
//declaring and defining the array variables
char a[] = "Amardeep";
char c[] = "Paramesh";
//displaying the output
printf("%s\n",a);
printf("%s\n",c);
}
```

Output:

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```
#include<stdio.h> //Used to include basic c library files
int sum(int a, int b);// Including method
void main()//main() method for executing the application
{
//declaring and defining the variables
int a=100;
int b=200;
//displaying the output
printf("Sum of %d and %d is=%d\n",a,b,sum(a,b));//sum(a,b) is
calling method
}
//called method
int sum(int a, int b)
{
return a*b;//instead of sum here developer make a mistake by
return multiplication logic
}
```

Output:

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```
#include<stdio.h> //Used to include basic c library files
void main() //main() method for executing the application
{
//declaring and defining the variables
int a=100;
int b=200;
int a+b=c;//sematic error by unkwoning c language code
//displaying the output
printf("%d %d",a,b);
}
```

Output:

Conclusion

Errors in C language are occurred due to writing understandable statements passed to

compiler then the compiler throws some errors. These errors can be programmer mistakes or

sometimes machine insufficient memory to load the code. Errors are mainly 5 types that are

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in C along with different examples and its code implementation. You may also have a look at the following articles to learn more –

1. Timer in C# (https://www.educba.com/timer-in-c-sharp/)
2. Double Pointer in C (https://www.educba.com/double-pointer-in-c/)
3. Void Pointer in C (https://www.educba.com/void-pointer-in-c/)
4. Stderr in C (https://www.educba.com/stderr-in-c/)

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