UNIT-I
Types of Errors

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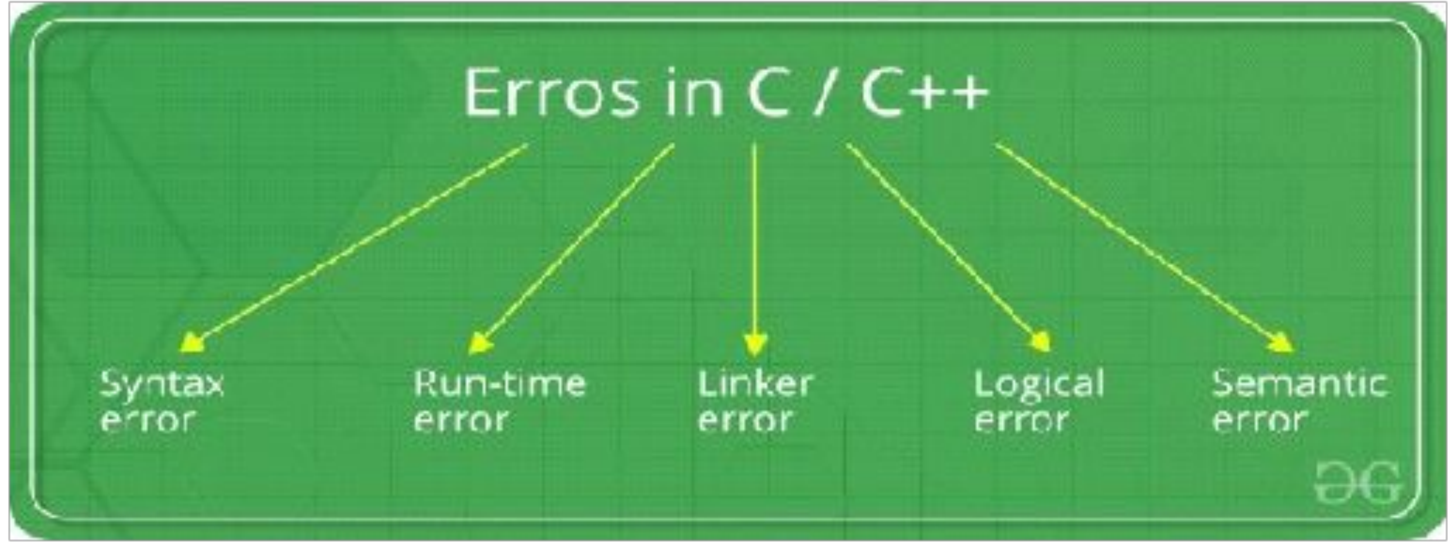
Errors in C/C++

Error is an illegal operation performed by the user which results in abnormalworking of the program.

Programming errors often remain undetected until the program is compiled or executed. Some of the errors inhibit the program from getting compiled or executed. Thus errors should be removed before compiling and executing.

The most common errors can be broadly classified as follows.

Type of errors



1. Syntax errors: Errors that occur when you violate the rules of writing C/C++syntax are known as syntax errors. This compiler error indicates something thatmust be fixed before the code can be compiled. All these errors are detected bycompiler and thus are known as compile-time errors.

Most frequent syntax errors are:

- Missing Parenthesis (})
- Printing the value of variable without declaring it

Missing semicolon like this

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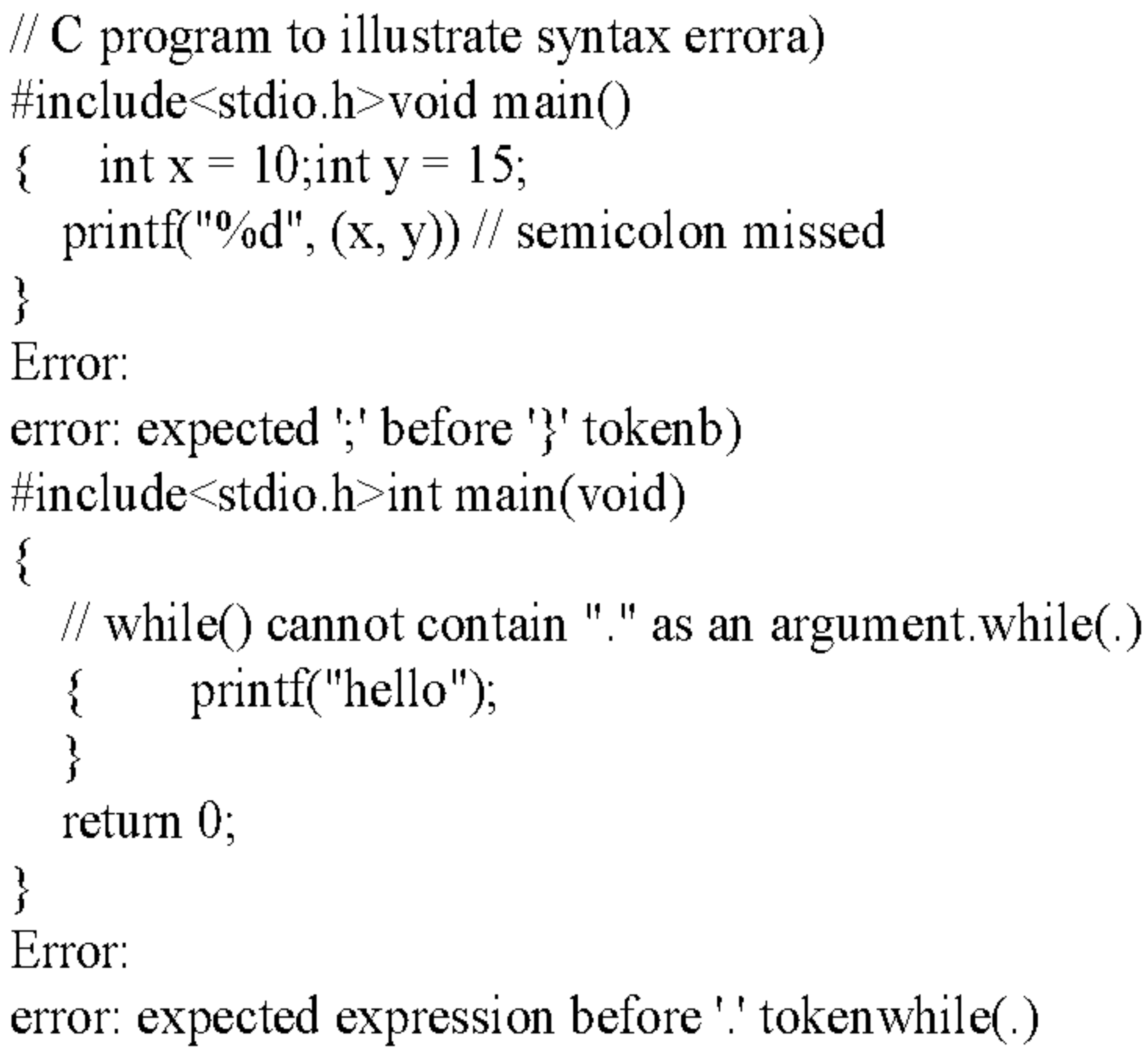

```
// C program to illustrate syntax errora)
#include<stdio.h>void main()
{    int x = 10;int y = 15;
   printf("%d", (x, y)) // semicolon missed
}
Error:
error: expected ';' before '}' tokenb)
#include<stdio.h>int main(void)
{
   // while() cannot contain "." as an argument.while(.)
   {       printf("hello");
   }
   return 0;
}
Error:
error: expected expression before '.' tokenwhile(.)
```

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2. Run-time Errors : Errors which occur during program execution(run-time) after successful compilation are called run-time errors. One of the most common run-timeerror is division by zero also known as Division error. These types of error are hard to find as the compiler doesn’t point to the line at which the error occurs.

```
// C program to illustrate run-time error#include<stdio.h>
void main()
{     int n = 9, div = 0;
       // wrong logic
     // number is divided by 0,
     // so this program abnormally terminatesdiv = n/0;
     printf("resut = %d", div);
}
```

Error:

```
warning: division by zero [-Wdiv-by-zero]div = n/0;
```

Linker Errors: These error occurs when after compilation we link the different object files with main’s object using Ctrl+F9 key(RUN). These are errors generated when the executable of the program cannot be generated. This may be due to wrong

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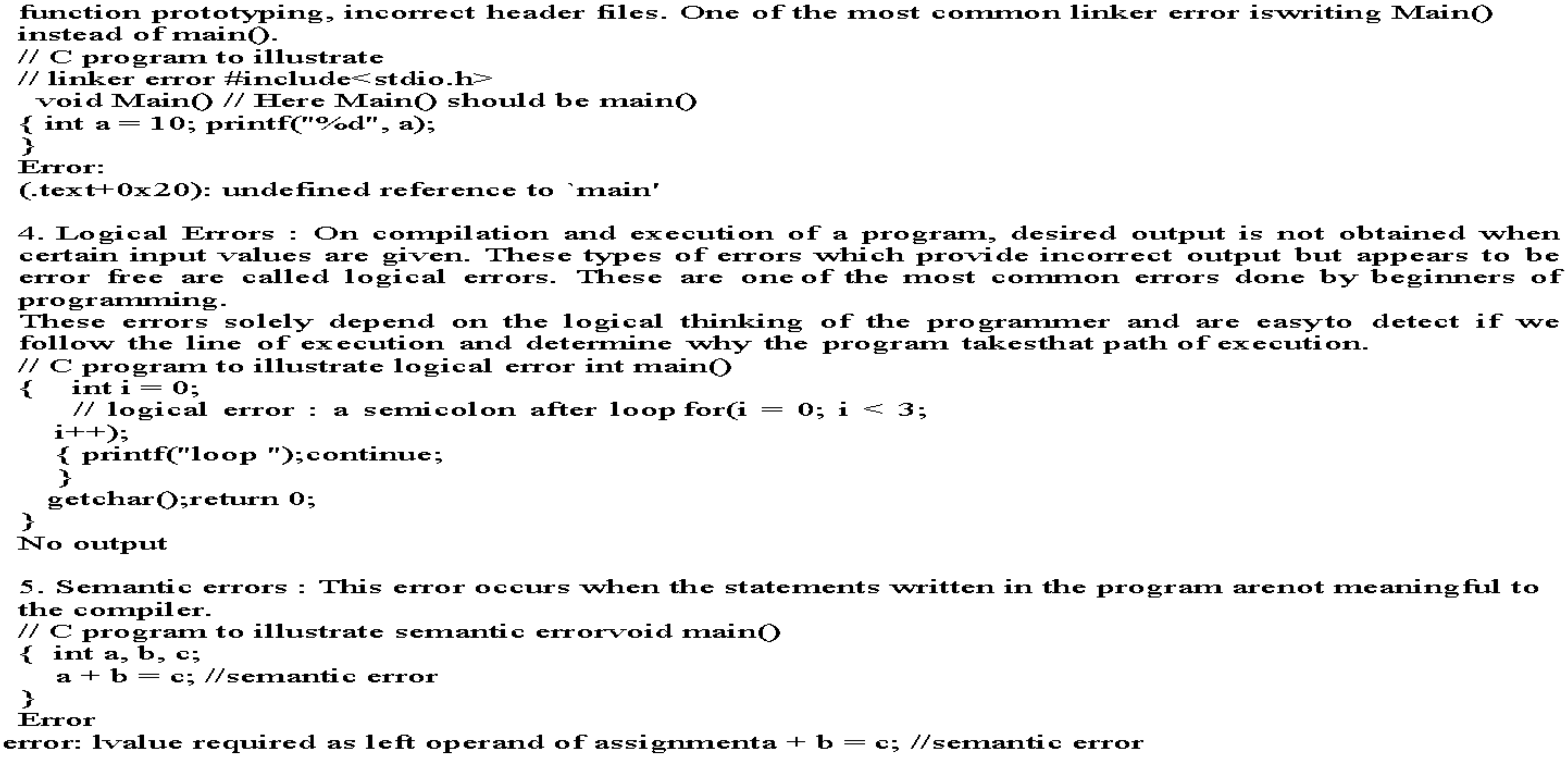

function prototyping, incorrect header files. One of the most common linker error iswriting Main() instead of main().

```
// C program to illustrate
// linker error #include<stdio.h>
 void Main() // Here Main() should be main()
{ int a = 10; printf("%d", a);
}
Error:
(.text+0x20): undefined reference to `main'
```

4. Logical Errors : On compilation and execution of a program, desired output is not obtained when certain input values are given. These types of errors which provide incorrect output but appears to be error free are called logical errors. These are one of the most common errors done by beginners of programming.
These errors solely depend on the logical thinking of the programmer and are easyto detect if we follow the line of execution and determine why the program takesthat path of execution.

```
// C program to illustrate logical error int main()
{    int i = 0;
      // logical error : a semicolon after loop for(i = 0; i < 3;
    i++);
    { printf("loop ");continue;
    }
   getchar();return 0;
}
No output
```

5. Semantic errors : This error occurs when the statements written in the program arenot meaningful to the compiler.

```
// C program to illustrate semantic errorvoid main()
{  int a, b, c;
    a + b = c; //semantic error
}
Error
error: lvalue required as left operand of assignmenta + b = c; //semantic error
```