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With the aid of a diagram, describe how a C++ code can be converted to Machine Language code.

Answer

Source program

Intermediate representation

Target program

The above is a standard compilation process which any program waiting to be converted to its corresponding machine code by using a compiler must undergo.

**-Lexical analysis**

This stage is when the characters which make up the source programs is read from left to right and grouped into tokens

**-Syntax analysis**

The grammatical rule guiding the C++ program is then checked by the compiler at this stage

-**Semantic analysis**

The code is then checked for any semantic errors at this stage. The compiler usually checks for undeclared variables, access variation, incompatible operands and type mismatches.

**-Intermediate code generation**

This stage makes it easy to generate and translate to target program. This is where intermediate representation of the source program is created.

**-Intermediate code optimization**

Here the compiler tries to produce the smallest, fastest, and most efficient running result by applying various techniques. The optimizer does this by accepting input in the intermediate representation

**-Object code generation**

The target program is generated here the output is usually machine code/assembly code.

**-Object code optimization**

Here the compiler tries to transform the object code into a tighter more efficient object code. Also hardware features and their efficiency are considered here. This part can be skipped directly to target code