Unit-1

Introduction

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Introduction

- Part and Parcel of computer systems
- Makes user's computing requirements
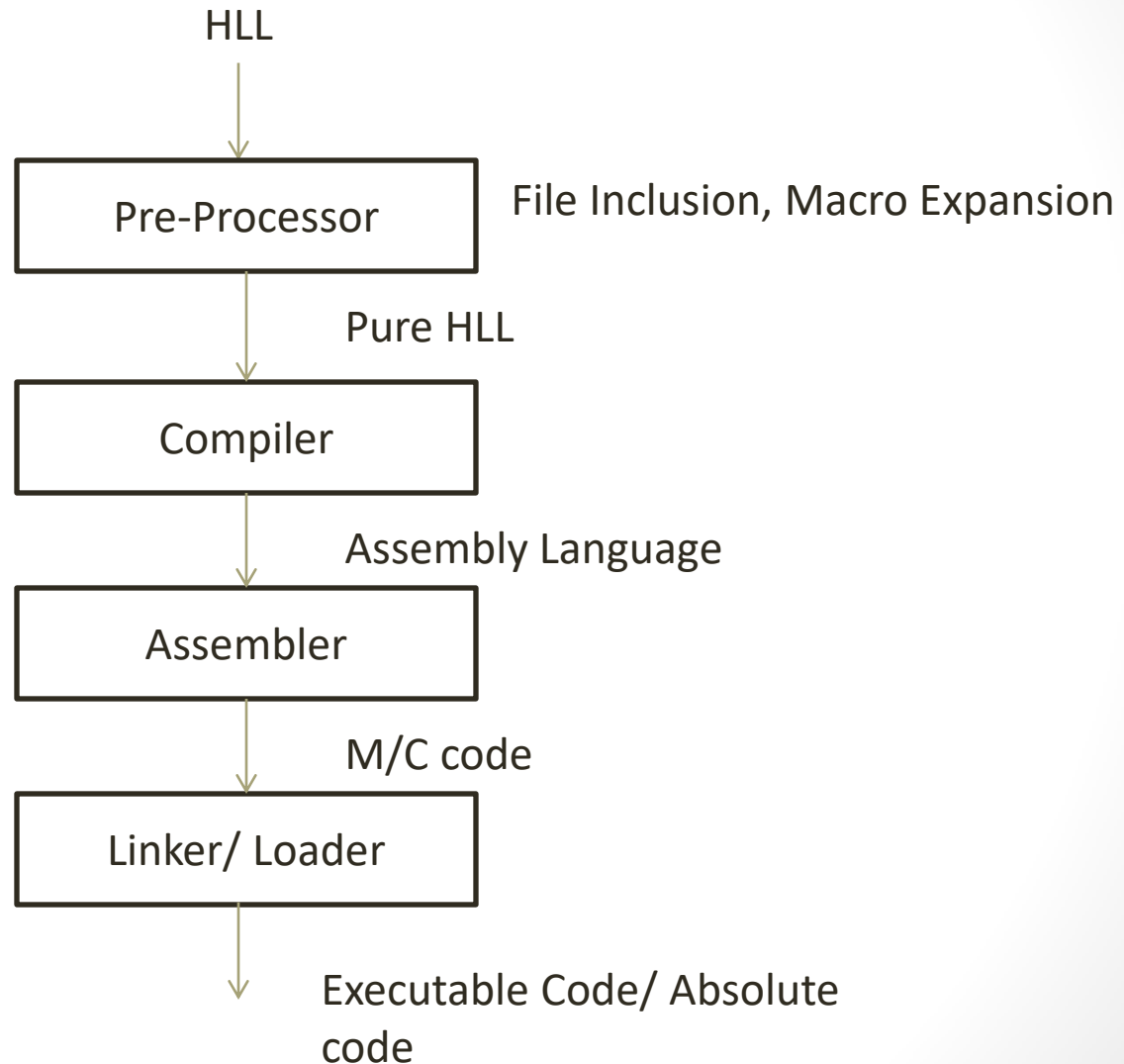- Complex transformation
- System Software

Application of Compiler

- Machine code generation
- Format converters
- Query optimization
- Text Formatting

Characteristics of Good Compiler

- It must be bug free
- Must be generate correct machine code
- Generated machine code must run fast
- Compiler itself must run fast
- Portable
- Print good diagnostics& error messages
- Generated code must work well with existing debuggers
- Must have consistent & predictable optimization

Modules with Compiler

HLL

↓

```
+---------------------+
|    Pre-Processor    |     File Inclusion, Macro Expansion
+---------------------+
```

Pure HLL

↓

```
+---------------------+
|      Compiler       |
+---------------------+
```

Assembly Language

↓

```
+---------------------+
|      Assembler      |
+---------------------+
```

M/C code

↓

```
+---------------------+
|    Linker/ Loader   |
+---------------------+
```

↓

Executable Code/ Absolute code

Pre-processor

```
# define A 5
# define B 10
# define C  (A * B)
main ( )
{
        int var;
         var c;

}
```

```
main ( )
{
    int var;
    var = ( 5 * 10 );
}
```

```
Example:
# define min (x, y) ((x) < ( y ) ? (x) : ( y ))
main ()
{
        x = min (1, 2);

}
```

Compiler

- Input is Pure HLL
- Generate Assembly code

Assembler

- Depends on hardware assembler is used
- Generate re-locatable machine code

Linker

- Combining various piece of code & data
- Generate executable file

Loader

- System programs
- Loads the binary code in the memory ready for execution