الكلية التقنية الهندسية
قسم هندسة تقنيات الحاسوب

COMPILERS

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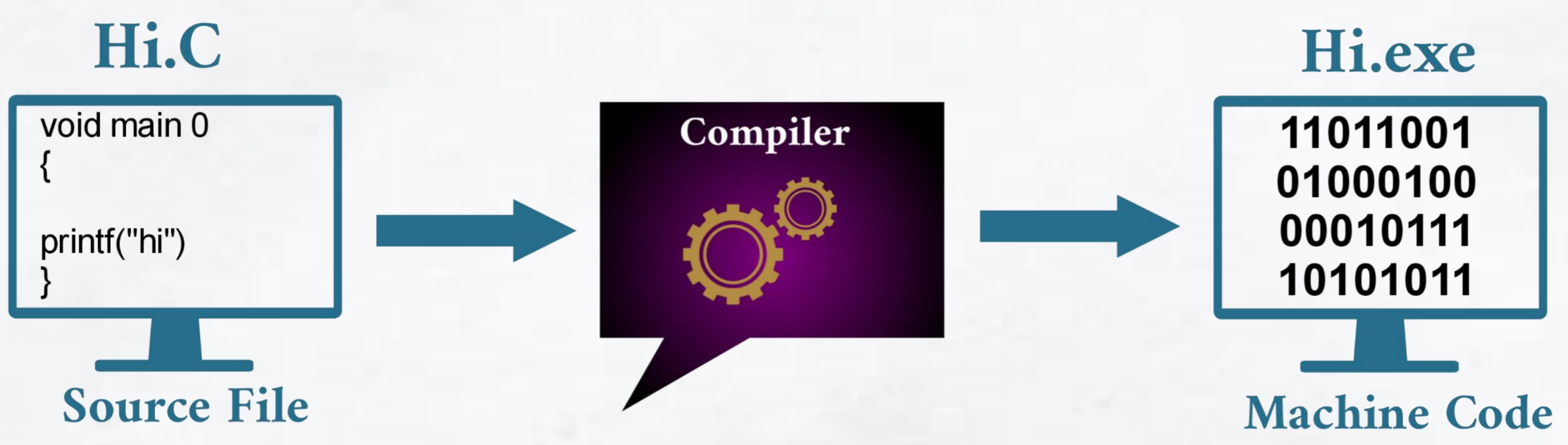
INTRODUCTION :

A compiler is a program that converts code written in one programming language into another. It might take code written in Ruby and turn it into C, or code written in JavaScript and turn it into Machine Code. The code accepts as input is known as the source language. The code that it outputs is known as the target language. Most programming languages are written for people to understand and be able to write. Unfortunately, computers don't understand humans very well, so languages that are easy for us to read or write are impossible for computers to read and understand.

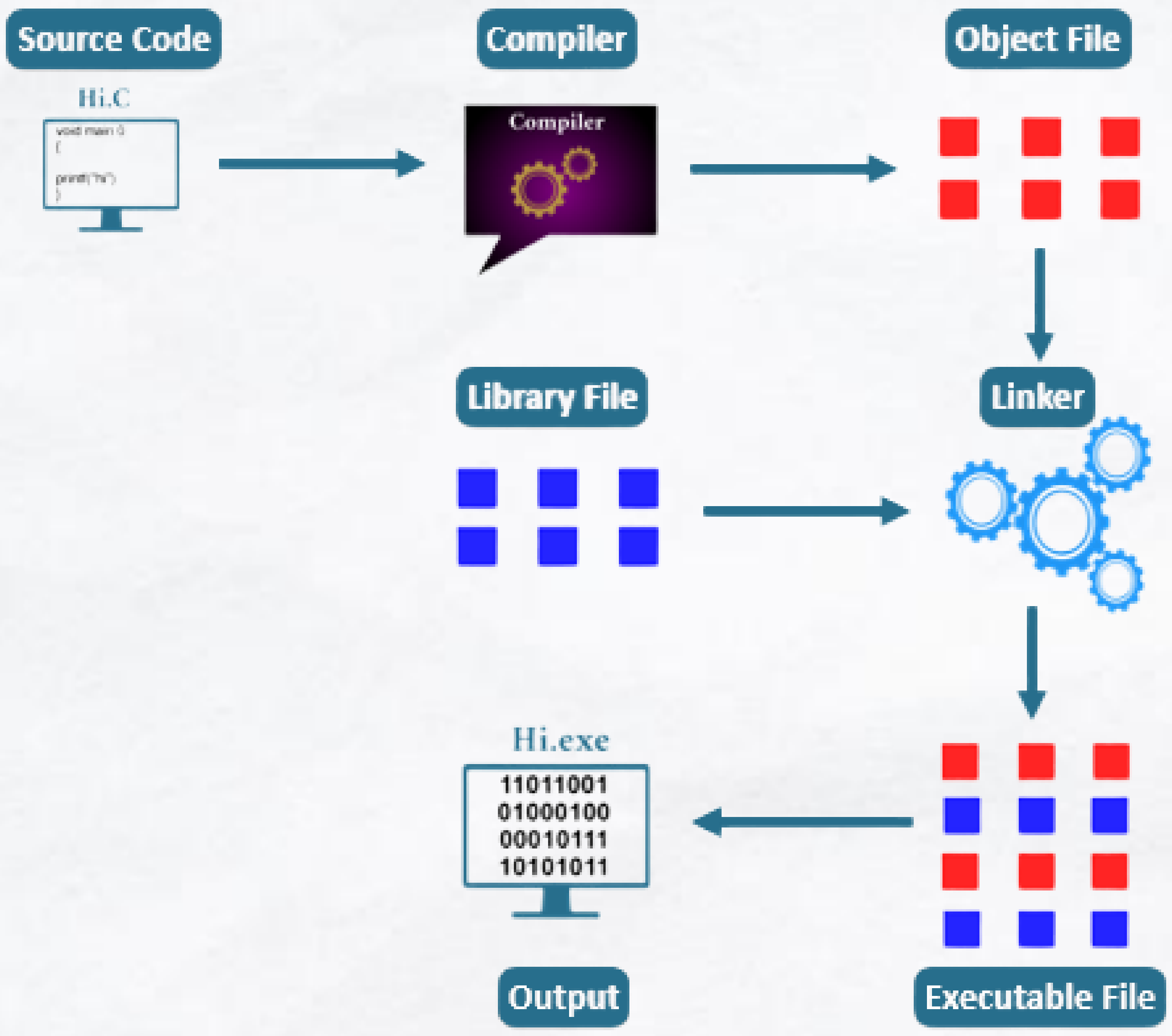
COMPILER OPERATION :

A compiler takes the program code (source code) and converts the source code to a machine language module (called an object file). Another specialized program, called a linker, combines this object file with other previously compiled object files (in particular run-time modules) to create an executable file. So, for a compiled language the conversion from source code to machine-executable code takes place before the program is run. This is a very different process from what takes place for an interpreted programming language. This is somewhat simplified as many modern programs that are created using compiled languages make use of dynamically linked libraries or shared libraries. Therefore, the executable file may require these dynamically linked libraries (Windows) or shared libraries (Linux, Unix) to run.



```
void main 0
{
printf("hi")
}
```

```
11011001
01000100
00010111
10101011
```



```
11011001
01000100
00010111
10101011
```

COMPILER TYPES :

1. Traditional Compilers (C, C++, and Pascal)
2. Interpreters (LISP, SNOBOL, and Java1.0)
3. Cross-Compilers
4. Incremental Compilers Converters (COBOL to C++)
5. Just-In-Time (JIT) Compilers (Java, Micosoft.NET)
6. Single-Pass Compiler
7. Multi-Pass Compiler
8. Ahead-of-Time (AOT) Compilers (.NET ngen)
9. Binary Compilation

Types of Programming Languages
Kotlin
Go
Objective C
Python
Ruby
R
C#
Java
Swift