Introduction to Algorithmics

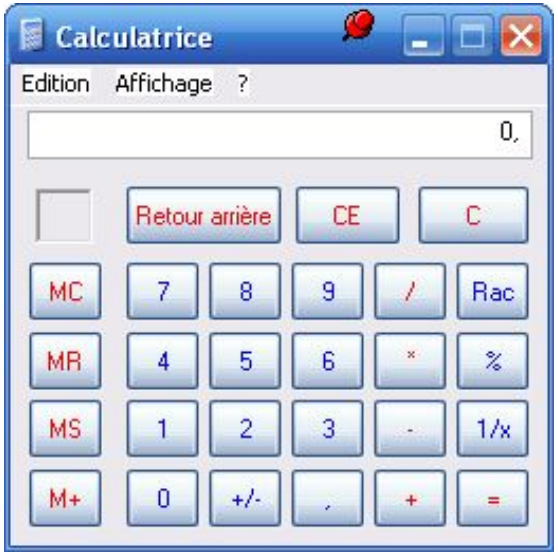
What Does "Programming" Mean?

Programming means creating "computer programs". Programs instruct the computer to perform actions.

- Your Microsoft Word is a program.
- Facebook is a program.
- Video games are programs.
- Spotify is a program
- ...

What Does "Programming" Mean?

Programming means creating "computer programs". Programs instruct the computer to perform actions.



- A calculator is a program.
- Your Microsoft Word is a program.
- Facebook is a program.
- Video games are programs.
- Spotify is a program
- ...

What Does "Programming" Mean?

Programming means creating "computer programs". Programs instruct the computer to perform actions.

- Your Microsoft Word is a program.
- Facebook is a program.
- Video games are programs.
- Spotify is a program
- ...

What Does "Programming" Mean?

Programming means creating "computer programs". Programs instruct the computer to perform actions.

- Your Microsoft Word is a program.
- Facebook is a program.
- Video games are programs.
- Spotify is a program
- ...

What Does "Programming" Mean?

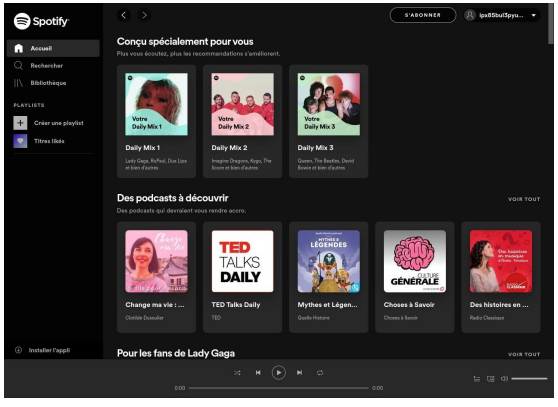
Programming means creating "computer programs". Programs instruct the computer to perform actions.

- Your Microsoft Word is a program.
- Facebook is a program.
- Video games are programs.
- Spotify is a program
- ...

What Does "Programming" Mean?

Programming means creating "computer programs". Programs instruct the computer to perform actions.

- Your Microsoft Word is a program.
- Facebook is a program.
- Video games are programs.
- Spotify is a program
- ...



"Programming", indeed! But which language should we use?

- The computer only understands machine language. For example, the instruction "Perform the calculation 4 + 7" is translated into machine language as: **00101101100100110100111110**
- This machine language is called **binary language**
- This binary language is **incomprehensible.**
- The computer does not speak English, French, or Arabic.

Problem

binary?

"Programming", indeed! But which language should we use?

- The computer only understands machine language. For example, the instruction "Perform the calculation 4 + 7" is translated into machine language as: **00101101100100110100111110**
- This machine language is called **binary language**
- This binary language is **incomprehensible.**
- The computer does not speak English, French, or Arabic.

Problem

binary?

"Programming", indeed! But which language should we use?

- The computer only understands machine language. For example, the instruction "Perform the calculation 4 + 7" is translated into machine language as: **00101101100100110100111110**
- This machine language is called **binary language**
- This binary language is **incomprehensible**.
- The computer does not speak English, French, or Arabic.

Problem

binary?

"Programming", indeed! But which language should we use?

- The computer only understands machine language. For example, the instruction "Perform the calculation 4 + 7" is translated into machine language as: **00101101100100110100111110**
- This machine language is called **binary language**
- This binary language is **incomprehensible**.
- The computer does not speak English, French, or Arabic.

Problem

binary?

"Programming", indeed! But which language should we use?

- The computer only understands machine language. For example, the instruction "Perform the calculation 4 + 7" is translated into machine language as: **00101101100100110100111110**
- This machine language is called **binary language**
- This binary language is **incomprehensible**.
- The computer does not speak English, French, or Arabic.

Problem

binary?

Programming Languages

- Invent new languages that can be translated into binary for the computer.
- The most challenging part is to create the program that performs this "translation."
- Fortunately,this program has already been written by computer scientists, so we won't have to rewrite it.
- We will use it to write sentences like "Perform the calculation 3 + 5," which will be translated by the "translation" program into something like "00101101100100110100111110."

Programming Languages

- Invent new languages that can be translated into binary for the computer.
- The most challenging part is to create the program that performs this "translation."
- Fortunately,this program has already been written by computer scientists, so we won't have to rewrite it.
- We will use it to write sentences like "Perform the calculation 3 + 5," which will be translated by the "translation" program into something like "00101101100100110100111110."

Programming Languages

- Invent new languages that can be translated into binary for the computer.
- The most challenging part is to create the program that performs this "translation."
- Fortunately,this program has already been written by computer scientists, so we won’t have to rewrite it.
- We will use it to write sentences like "Perform the calculation 3 + 5," which will be translated by the "translation" program into something like "00101101100100110100111110."

Programming Languages

- Invent new languages that can be translated into binary for the computer.
- The most challenging part is to create the program that performs this "translation."
- Fortunately,this program has already been written by computer scientists, so we won’t have to rewrite it.
- We will use it to write sentences like "Perform the calculation 3 + 5," which will be translated by the "translation" program into something like "00101101100100110100111110."

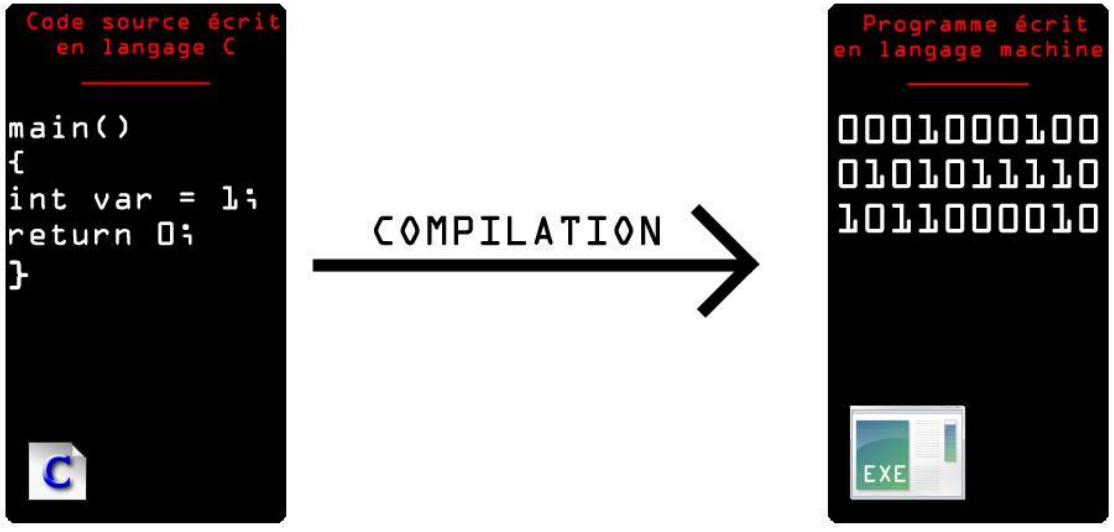
Programming Languages

- Invent new languages that can be translated into binary for the computer.

  this "translation."

  scientists, so we won't have to rewrite it.

  5," which will be translated by the "translation" program into something like "00101101100100110100111110."



Why Program in C?

- There are many programming languages like C, C++, Java, Visual Basic, Python, etc.
- C is a very popular language.
- It provides a solid foundation in programming and computer architecture.
- It equips you with skills to learn any other programming languages easily.
- It's used for developing various software applications.
- Often taught in computer science studies.

Why Program in C?

- There are many programming languages like C, C++, Java, Visual Basic, Python, etc.
- C is a very popular language.
- It provides a solid foundation in programming and computer architecture.
- It equips you with skills to learn any other programming languages easily.
- It's used for developing various software applications.
- Often taught in computer science studies.

Why Program in C?

- There are many programming languages like C, C++, Java, Visual Basic, Python, etc.
- C is a very popular language.
- It provides a solid foundation in programming and computer architecture.
- It equips you with skills to learn any other programming languages easily.
- It's used for developing various software applications.
- Often taught in computer science studies.

Why Program in C?

- There are many programming languages like C, C++, Java, Visual Basic, Python, etc.
- C is a very popular language.
- It provides a solid foundation in programming and computer architecture.
- It equips you with skills to learn any other programming languages easily.
- It's used for developing various software applications.
- Often taught in computer science studies.

Why Program in C?

- There are many programming languages like C, C++, Java, Visual Basic, Python, etc.
- C is a very popular language.
- It provides a solid foundation in programming and computer architecture.
- It equips you with skills to learn any other programming languages easily.
- It's used for developing various software applications.
- Often taught in computer science studies.

Why Program in C?

- There are many programming languages like C, C++, Java, Visual Basic, Python, etc.
- C is a very popular language.
- It provides a solid foundation in programming and computer architecture.
- It equips you with skills to learn any other programming languages easily.
- It's used for developing various software applications.
- Often taught in computer science studies.

Is Programming difficult?

- Do you need to be a genius to start programming? NO
- Do you need to be an eminent mathematician to start programming? NO
- You just need to understand how computers work.
- However, programmers need qualities like:
  - **Patience:** A program never works perfectly on the first try; you need to persistent!

    you'll still need to think logically.

    your program work.

Is Programming difficult?

- Do you need to be a genius to start programming? **NO**
- Do you need to be an eminent mathematician to start programming? **NO**
- You just need to understand how computers work.
- However, programmers need qualities like:
  - **Patience:** A program never works perfectly on the first try; you need to persistent!

    you'll still need to think logically.

    your program work.

Is Programming difficult?

- Do you need to be a genius to start programming? **NO**
- Do you need to be an eminent mathematician to start programming? **NO**
- You just need to understand how computers work.
- However, programmers need qualities like:
  - **Patience:** A program never works perfectly on the first try; you need to persistent!

    you'll still need to think logically.

    your program work.

Is Programming difficult?

- Do you need to be a genius to start programming? **NO**

- Do you need to be an eminent mathematician to start programming? **NO**

- You just need to understand how computers work.

- However, programmers need qualities like:
  - **Patience:** A program never works perfectly on the first try; you need to persistent!

    you'll still need to think logically.

    your program work.

Is Programming difficult?

- Do you need to be a genius to start programming? **NO**
- Do you need to be an eminent mathematician to start programming? **NO**
- You just need to understand how computers work.
- However, programmers need qualities like:
  - **Patience:** A program never works perfectly on the first try; you need to persistent!

    you'll still need to think logically.

    your program work.

Is Programming difficult?

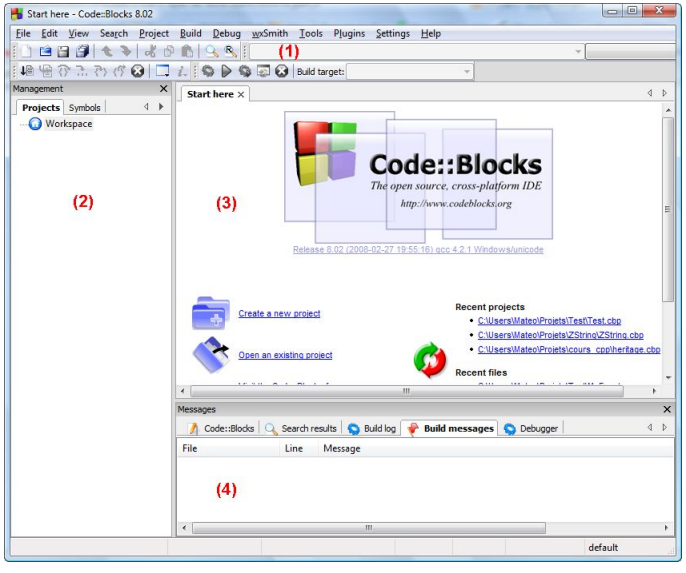
- Do you need to be a genius to start programming? **NO**
- Do you need to be an eminent mathematician to start programming? **NO**
- You just need to understand how computers work.
- However, programmers need qualities like:
  - **Patience:** A program never works perfectly on the first try; you need to persistent!

    you'll still need to think logically.

    your program work.

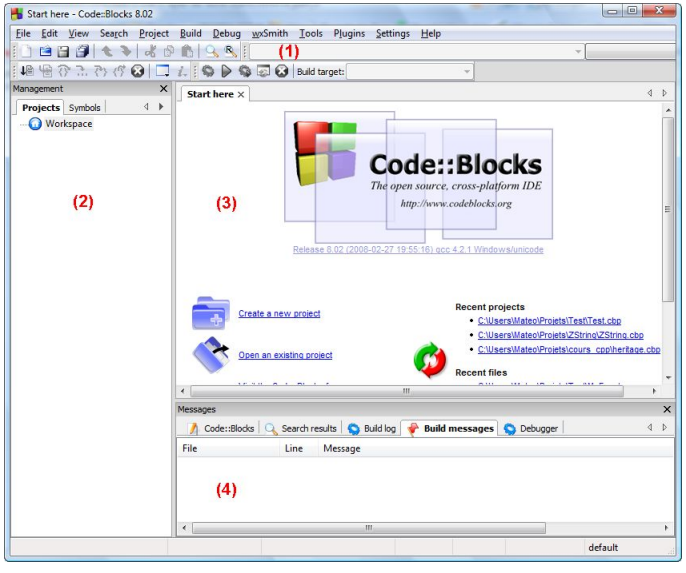
What Do You Need for C Programming?

- Programmers need three tools: a text editor, a compiler, and a debugger.
- You can install these tools separately or use an Integrated Development Environment (IDE).
- IDEs like Code::Blocks, Visual C++, Pycharm and Xcode simplify the development process.



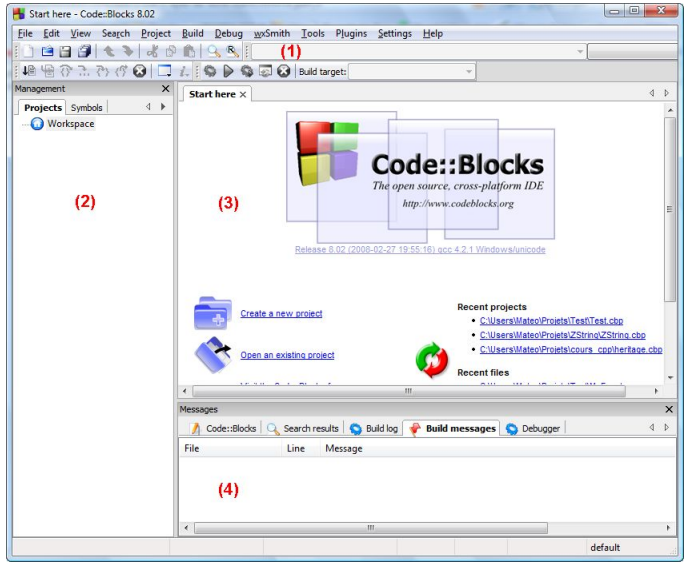
What Do You Need for C Programming?

- Programmers need three tools: a text editor, a compiler, and a debugger.
- You can install these tools separately or use an Integrated Development Environment (IDE).
- IDEs like Code::Blocks, Visual C++, Pycharm and Xcode simplify the development process.



What Do You Need for C Programming?

- Programmers need three tools: a text editor, a compiler, and a debugger.
- You can install these tools separately or use an Integrated Development Environment (IDE).
- IDEs like Code::Blocks, Visual C++, Pycharm and Xcode simplify the development process.



My First C Program

Example C Program

```
# include   <stdio .h>

int   main ()   {
        printf ("Hello ,   World !\n");
        return   0;
}
```

- when you run this program, it will display "Hello, World!" on the screen and then terminate with a success status of 0.
- This simple program is often used as a starting point for learning new programming languages, as it provides a basic understanding of how to output text to the console.

Comments in C

Example:

```
/* Below are preprocessor directives. These lines add files
      to the project,
files called libraries. Thanks to these libraries, we have
      pre-made functions to display messages on the screen. */

# include  <stdio .h>
# include  <stdlib .h>

/* Below, you have the main function of the program, called
      main. All programs start with this function. Here, my
      function simply displays "Hello" on the screen. */

int  main ()
{
   printf (" Hello "); // This instruction displays "Hello" on
         the screen
   return  0;        // The program returns the number 0 and stops
}
```