Intro - Programming Cycle

Week1

The Programming Cycle

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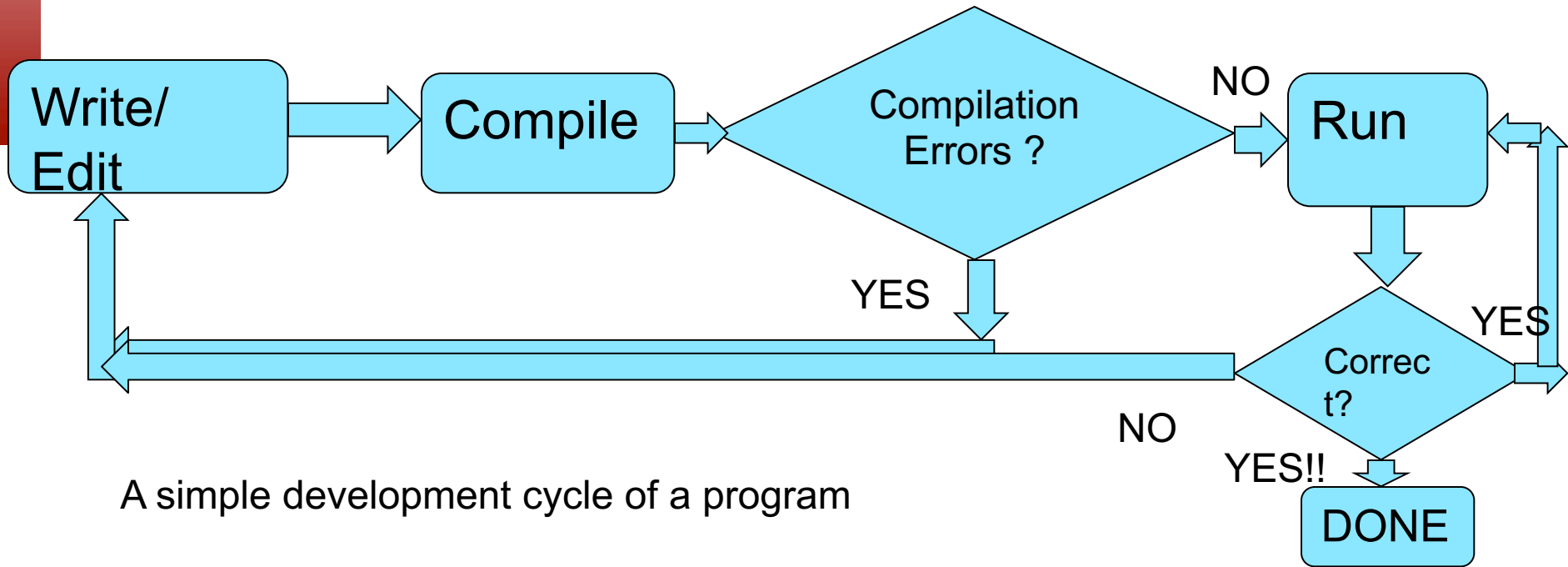

A simple development cycle of a program

Editing

- Open an editor. An editor is a system program that lets you type in text, modify and update it.

- Create your program. Type in your program in an editor. For example use the program gedit or Notepad++. Save what you type into a file called sample.c.

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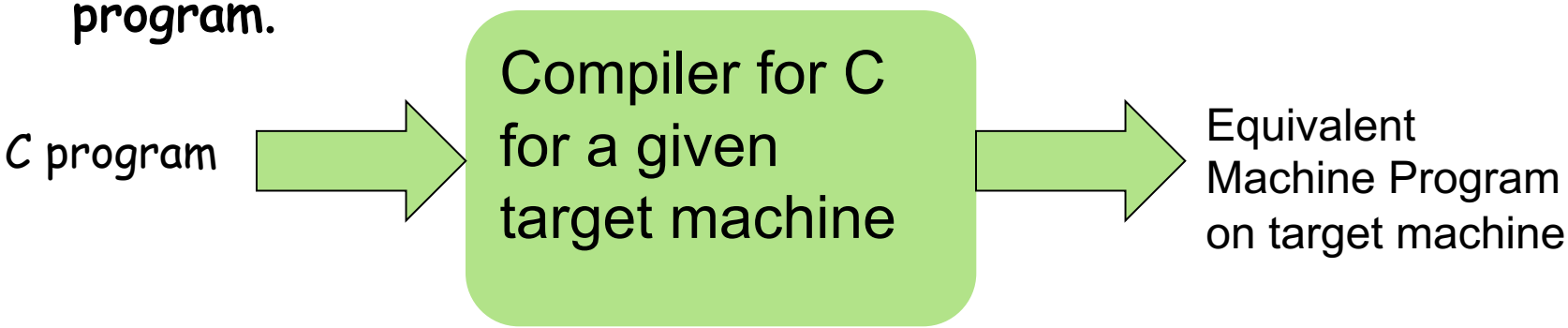
- The microprocessor cannot execute this statement. It translates it into an equivalent piece of code consisting of even more basic statements. For example
  - Load from memory location 0xF04 into register R1
  - Load from memory location 0xF08 into register R2
  - Integer divide contents of R1 by contents of R2 and keep remainder in register R3
  - Store contents of R3 into memory location 0xF12.

Why program in high level languages like C

- Writing programs in machine language is long, tedious and error-prone.
- They are also not portable—meaning program written for one machine may not work on another machine.
- Compilers work as a bridge.
- Take as input a C program and produce an equivalent machine program.



How do you compile?

- On Unix/Linux systems you can **COMPILE** the program using the gcc command.

```
% gcc sample.c
%
```

- If there are no errors, then the system silently shows the prompt (%).
- If there are errors, the system will list the errors and line numbers. Then you can edit (change) your file, fix the errors and recompile.
- As long as there are compilation errors, the **EXECUTABLE** file is not created.

Compilation

- We will use the compiler *gcc* . The command is

```
% gcc  yourfilename.c
```

- gcc stands for Gnu C compiler.
- If there are no errors then gcc places the machine program in an executable format for your machine and calls it a.out.
- The file a.out is placed in your current working directory. More on directories in a little bit!

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main ()  {
     printf("Welcome to C");
}
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- Now compile the program. System compiles without errors.

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% ./a.out
Welcome to C%
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`printf("Welcome to C");` is a statement in C. Statements in C end in semicolon ;

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Try deliberately making these mistakes in your code. Save them and try to compile. Study the error messages for each.

Familiarity with error messages will help you find coding errors later.

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