Metropolia University of Applied Sciences

Programming

TI00AA43-3003

Lecture 1

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Plan for going forward

- **Variables and printing to screen**
- If, else, while and for loops
- I/O
- Functions and tables
- File handling
- Pointers and arrays
- Simple structures
- Program structure and design

1. Lectures

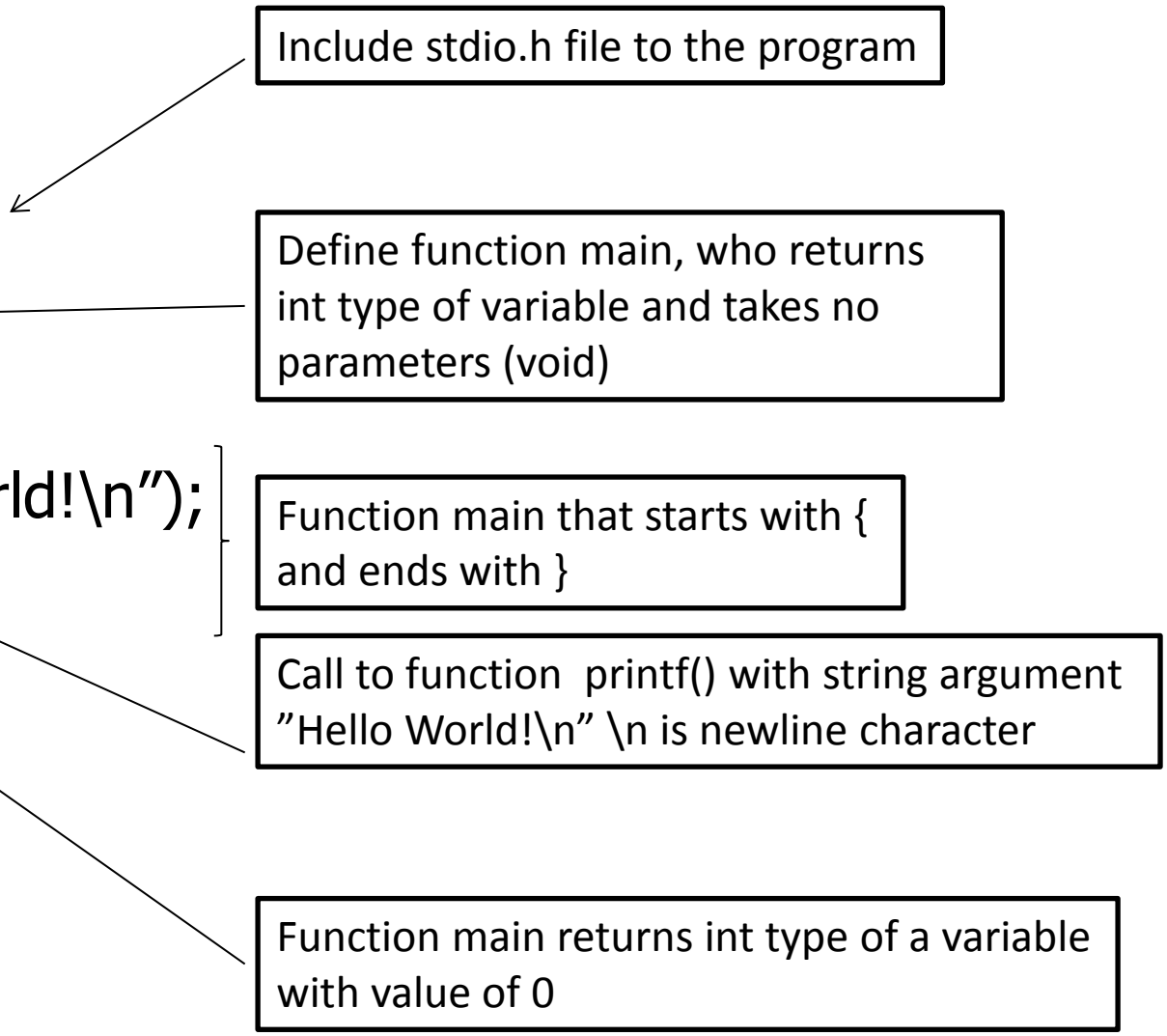
Hello World!

Variables and printing to screen

Hello World!

h_world.c

```
#include <stdio.h>
int main(void)
{
    printf(”Hello World!\n”);
    return 0;
}
```



General things about a C-program

- Function main() has a special role in the program. When the program is executed, it starts from the main() function.
  - Every C-program needs **one** main() !
- String constants are placed in doublequotes (”)
- Return from main() is passed to the operating system
  - Value 0, normal termination

How to get the code to run…?

- When writing a C-program, you can do that with notepad, notepad++, nano… you name it
- When saving the file, save it with .c file extension
- After this the file is just an ordinary text file that has a file extension telling that its a c-source file
  - Will this be executable as is?
  - Answer is no.
  - The .c file needs to be compiled

Compiling the code:

- Linux: use edunix.metropolia.fi
  - Write code (with nano for example) and save with .c extension (example lab1ex1.c)
- Windows:
  - Write code with notepad / notepad++
- Compiling (Linux and Windows):
  - gcc lab1ex1.c -o lab1ex1 (terminal / cmd)
    - Result:
    - Linux: lab1ex1 file, run with ./lab1ex1
    - Windows: lab1ex1.exe

Variables

- Different kind of variables available
  - int – integer that is usually 16 bits (microcontrollers), 32 bits or 64 bits
  - short and long – short and long int, size depends on environment
  - char – character, one byte
  - float and double – floating point numbers, single (6-9 decimals) and double (15-17 decimals) precision

Printing to the screen

- printf() function is part of <stdio.h> library
- printf() function arguments:
  - %d – int, %3d – 3 numbers wide int (fixed)
  - %f – float, %6f – 6 numbers wide float, %.2f – float with 2 numbers after the decimal marker
  - %s – string
- ”real” arguments, values that are printed

```
#include <stdio.h>
/* Program converts miles to kilometers*/
int main()
{

        printf(”Convert miles to kilometers\n");

        float mile_meters, miles, result;

        mile_meters = 1609.44;
        miles = 1;
        result = (miles * mile_meters);
        printf(”Converted: %f, miles to meters, result: %f \n", miles, result);
        result= (result/1000);
        printf(”Result in kilometers: %f \n", result);
        return 0;
}
```

There are many coding styles…

- C-compiler does not care if the code looks unreadable, are there comments or if the variable names make any sence
- But for both me and you, we care!
  - **Start with comments section, what does the code do?**
  - **Use describing names for the variables etc.**
  - **Use indentation to make the code more readable!**
- **NOTE! THIS IS MANDATORY TO PASS THE LABS!**