



German Jordanian University الجامعة الألمانية الأردنية

CS 111 Computing Fundamentals

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German-Jordanian University

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German Jordanian University الجامعة الألمانية الأردنية

Some tips for this course

- be interested
- listen and *think* during the lectures
- participate
- take notes
- practice at home and in the lab
 - www.codeblocks.org
(download the version with mingw)
- learn from error messages and previous errors



<http://home.swbell.net/moonshad/write-us.html>



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Our first program

```
1 #include <stdio.h>
```

```
2  
3 int main()
```

```
4 {  
5     printf("Ahlan wa sahlan to Computing Fundamentals!\n");  
6  
7     return 0;  
8 }  
9
```

C Code\Lecture 1\Lecture 1\bin\Debug\Lecture 1.exe" (in C:\cclass\GJU\CS 111 Computing s\)

C:\ "C:\cclass\GJU\CS 111 Computing Fundamentals\Fall 2010\C Code\Lecture 1\Lecture 1\bin

Ahlan wa sahlan to Computing Fundamentals!

Process returned 0 (0x0) execution time : 0.172

Press any key to continue.

```
#include <stdio.h>

int main()
{
    printf("Ahlan wa sahan to Computing
Fundamentals!\n" );

    return 0;
}
```

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    printf("Ahlan wa sahlan to Computing  
Fundamentals!\n" );
```

```
    return 0;
```

```
}
```

- with include we specify the name of the standard library for input/output functions, that shall be included.
- printf is a function in this library
- when we don't tell C where to find the function, the compiler issues a warning
- we will always include stdio.h in the first statement

```
1
2
3  int main()
4  {
5      printf("Ahlan wa sahlam to Computing Fundamentals!\n");
6
7      return 0;
8  }
9
```

logs & others

Code::Blocks Search results Build log X Build messages Debugger

----- Build: Debug in Lecture 1 -----

Compiling: prg1.c

C:\cclass\GJU\CS 111 Computing Fundamentals\Fall 2010\C Code\Lecture 1\Lecture 1\prg1.c: In function 'main':

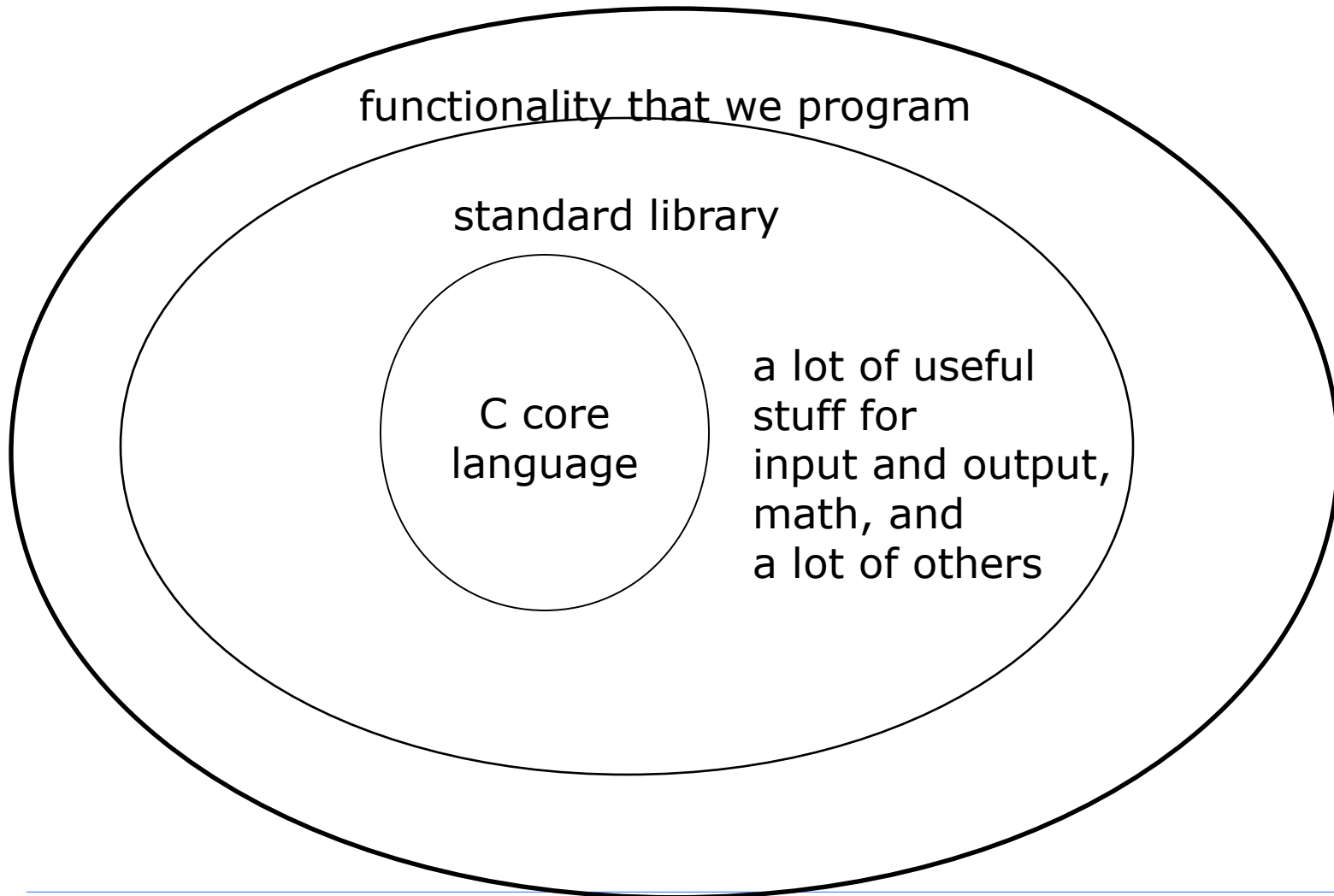
C:\cclass\GJU\CS 111 Computing Fundamentals\Fall 2010\C Code\Lecture 1\Lecture 1\prg1.c:5: warning: implicit declaration of function 'printf'

C:\cclass\GJU\CS 111 Computing Fundamentals\Fall 2010\C Code\Lecture 1\Lecture 1\prg1.c:5: warning: incompatible implicit declaration of built-in function 'printf'

Linking console executable: bin\Debug\Lecture 1.exe

Output size is 25.28 KB

a simplified model

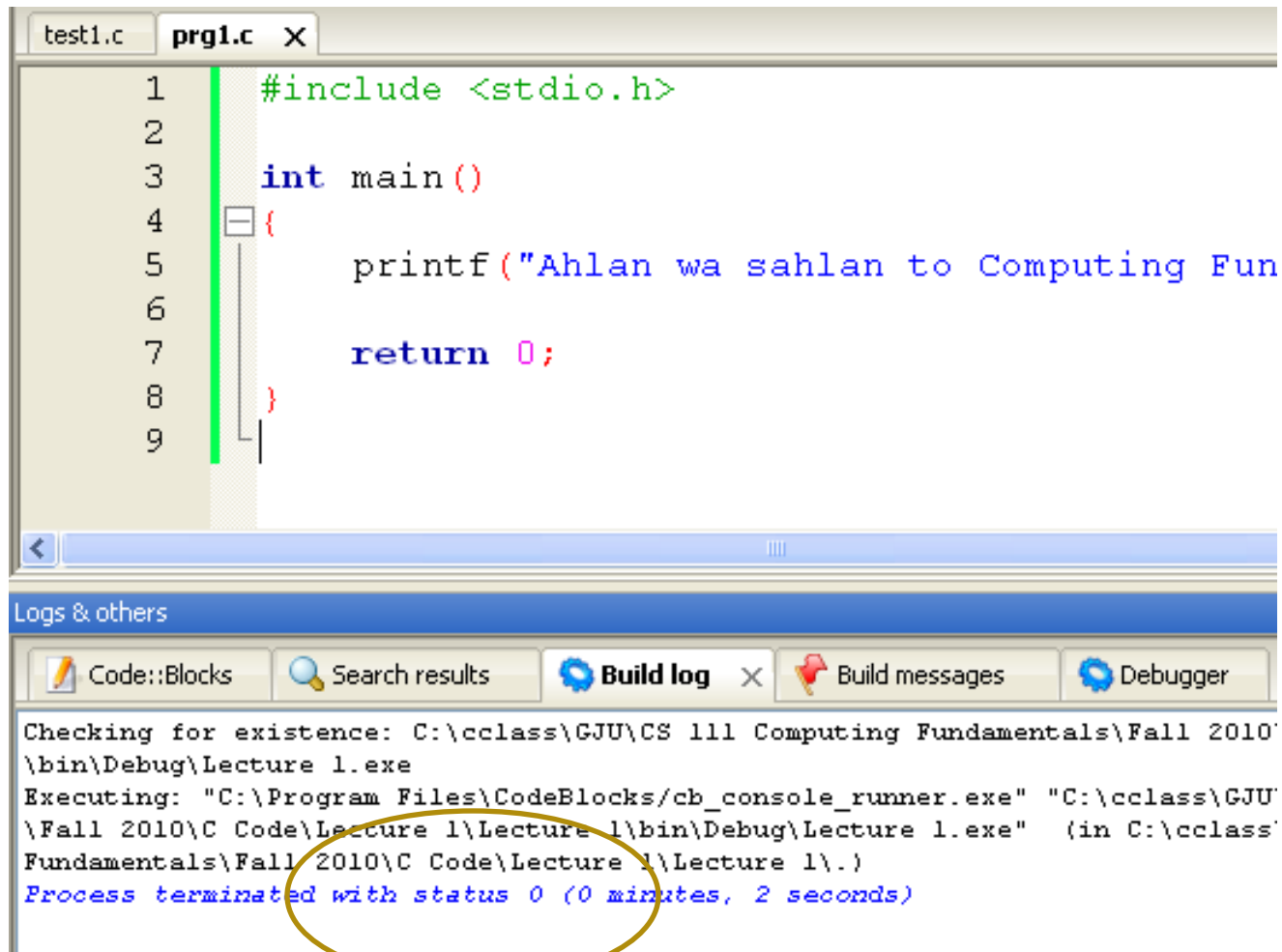


```
#include <stdio.h>

int main()
{
    printf("Ahlan wa sahlan to Computing Fundamentals!\n" );

    return 0;
}
```

C starts program execution always with the first statement in main().
main returns a value -> by this it can inform the calling process
whether any errors occurred.
By convention 0 means, that everything is okay!



```
test1.c  prg1.c  X
1  #include <stdio.h>
2
3  int main()
4  {
5      printf("Ahlan wa sahlan to Computing Fun
6
7      return 0;
8  }
9

Logs & others
Code::Blocks  Search results  Build log  X  Build messages  Debugger
Checking for existence: C:\cclass\GJU\CS 111 Computing Fundamentals\Fall 2010\
\bin\Debug\Lecture 1.exe
Executing: "C:\Program Files\CodeBlocks\cb_console_runner.exe" "C:\cclass\GJU
\Fall 2010\C Code\Lecture 1\Lecture 1\bin\Debug\Lecture 1.exe" (in C:\cclass\
Fundamentals\Fall 2010\C Code\Lecture 1\Lecture 1\.)
Process terminated with status 0 (0 minutes, 2 seconds)
```

```
1  #include <stdio.h>
2
3  int main ()
4  {
5      printf("Ahlan wa sahan to Comput
6
7      return 1;
8  }
9
```

Logs & others

Code::Blocks Search results Build log Build messages

Checking for existence: C:\cclass\GJU\CS 111 Computing Fundamentals
\bin\Debug\Lecture 1.exe
Executing: "C:\Program Files\CodeBlocks\cb_console_runner.exe" "C:\
\Fall 2010\C Code\Lecture 1\Lecture 1\bin\Debug\Lecture 1.exe" (in
Fundamentals\Fall 2010\C Code\Lecture 1\Lecture 1\.)
Process terminated with status 1 (0 minutes, 1 seconds)

```
#include <stdio.h>

int main(void)
{
    printf("Ahlan wa sahlan to Computing
Fundamentals!\n" );

    return 0;
}
```

we can also use the keyword **void** when we define main

In fact, this is more precise and therefore better!

```
#include <stdio.h>

int main()
{
    printf("Ahlan wa sahlan to Computing
Fundamentals!\n" );

    return 0;
}
```

Each statement (like the call to printf and return) should end with ;
Omitting the ; will lead to a compilation error

```
1  #include <stdio.h>
2
3  int main()
4  {
5      printf("Ahlan wa sahan to Computing Fundamentals!\n")
6
7      return 0;
8  }
9
```

Logs & others

Code::Blocks Search results Build log **Build messages** x Debugger

File	Line	Message
C:\cclass\GJU\...		In function 'main':
C:\cclass\GJU\...	7	error: expected ';' before 'return'
		=== Build finished: 1 errors, 0 warnings ===

The function printf

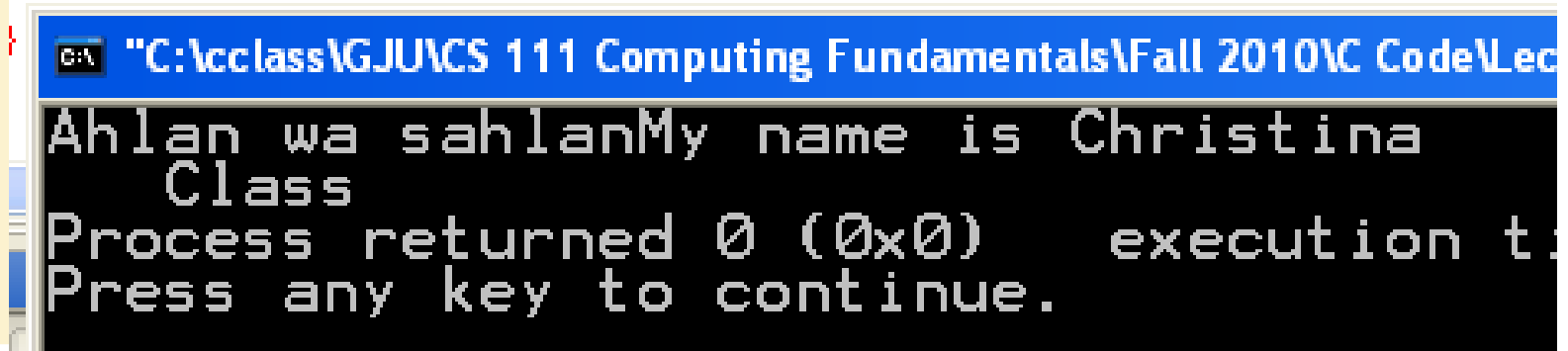
- The function `printf()`; is used to generate an output.
- It receives a string:
 - `printf("hello");`
 - `printf("asbddmas");`
- `\n` is an escape sequence that generates a new line

What is the output?

```
#include <stdio.h>

int main()
{
    printf("Ahlan wa sahlan");
    printf("My name is Christina\n    Class");

    return 0;
}
```



```
C:\cclass\GJU\CS 111 Computing Fundamentals\Fall 2010\C Code\Le...
Ahlan wa sahlanMy name is Christina
    Class
Process returned 0 (0x0)   execution time: 0.000 sec
Press any key to continue.
```

some escape sequences

escape sequence	character value
\'	single quotation mark
\"	double quotation mark
\%	percentage mark
\\	backslash
\b	backspace
\n	line feed
\t	horizontal tab
\v	vertical tab

Comments

- to improve readability of your code, you should use comments

```
// comment ends at the end of the line
```

```
/* this is  
a comment block  
that can be very long ! */
```

A Simple Program: Printing a Line of Text (Section 1.5)

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- **Comments**
 - Document programs
 - Improve program readability
 - Ignored by compiler
 - Single-line comment
 - Begin with `//` (**but only one line**)
 - Begin with `/*` and ends with `*/` (**several lines**)

- C code is case sensitive:
 - printf is not the same as printF
- Write your code slowly and carefully, especially at the beginning of our programming experiences.
Many errors are simple **typos!**

Compilation in 2 steps

```

1  #include <stdio.h>
2
3  int main()
4  {
5      Printf("Ahlan wa sahlan to Computing Fundamentals!\n");
6
7      return 0;
8  }
9
10

```

logs & others

Code::Blocks Search results Build log Build messages x Debugger

File	Line	Message
C:\cclass\GJU\...		In function 'main':
C:\cclass\GJU\... 5		<i>warning: implicit declaration of function 'Printf'</i>
obj\Debug\prgl.o		In function 'main':
C:\cclass\GJU\... 5		undefined reference to `Printf'
=== Build finished: 1 errors, 1 warnings ===		

1st Step: compiler:

cannot find Printf(),
makes assumptions
 warning

2nd Step: linker:

tries to find an implementation
of Printf() to build an executable
and cannot find it
 error

build unsuccessful
no executable file

By the way

- there are three different kind of errors:
 - syntax: e.g. when you forget a ; or have a spelling error [?] are detected by the compiler
 - semantic: when you use something in a wrong way [?] more difficult to detect
 - logical: [?] very hard to detect!

Exercises

- Find the syntax errors in the following programs.

```
include <stdio.h>
int main()
{
    printf("hallo");
    return 0;
}
```


Exercises

- Find the syntax errors in the following programs.
-

```
#include <stdio.h>
int main()
{
    printf("hallo")
    return 0;
}
```

Exercises

- Find the syntax errors in the following programs.
-

```
#include <stdio.h>
int main()
{
    print("hallo");
    return 0;
}
```

Exercises

- What will be the output of the following program?

```
#include <stdio.h>

int main ()
|{
    printf("hallo \bmy\n\nname\tis\bChristina\\\nClass");

    return 0;
}
```

- What will be the output of the following program?

```
#include <stdio.h>

int main ()
{
    printf ("hallo \bmy\n\nname\tis\bChristina\\\nClass");

    return 0;
}
```



```
hallo my
name is Christina \
Class
Process returned 0 (0x0) exe
Press any key to continue.
```

Exercises

- Write a C program to output your name and address in a nice form.

keywords/ phrases and exercises of today

- keywords:
 - `#include <stdio.h>`
 - `int main()`
 - `int main(void)`
 - `return 0;`
 - `printf();`
 - escape sequences: `\' \' " \\ \n \t \b`
- exercises: ex. 1 – 3 in “Programming in C”, p. 19