C Coding Tools (Development Environment)

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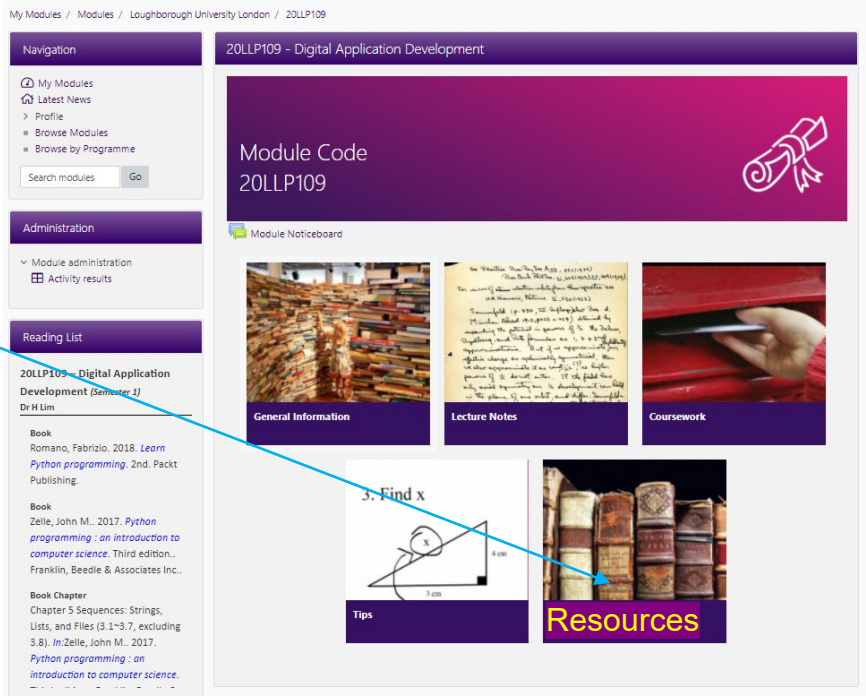
- I suppose you don't ask the lecturer how to use your **coding tools** after today, e.g. *Visual Studio*, especially during the lectures. Because **it is not in the main scope of this module** and we need to study and discuss much more important and valuable topics, such as pointers, data structures.

- Refer to ***Resources*** on *LEARN*



Installation of C Compilers (free)

- **Visual Studio** (standard, professional):
  https://visualstudio.microsoft.com/downloads/
- **NewbieIDE** (Windows, very simple and easy)
  Download from *Resources* on *LEARN*
  [Installation version] or [Portable (non-installation) version]
- **Code::blocks** (Windows, currently not for Mac OS)
  Download *codeblocks-17.12mingw-setup* or *codeblocks-17.12mingw-nosetup* at
  http://www.codeblocks.org/downloads/26
- Online C compilers, such as
  - https://www.programiz.com/c-programming/online-compiler/
- Refer to [*Resources*] on *LEARN*

main function

start/ end

- Any C program must have a ***main()*** function.

```
int main()
{
  ..................
  return 0;
}
```

// **New** standard: C99 (ISO)

```
void main()
{
  ..................
}
```

// Old standard: C89 (ANSI-C)

“Hello World!” in C

input/ output

```
#include <stdio.h>

int main( )    // C99 (ISO)
  {
     printf( "Hello World!" );
     getchar();
  }
```

You don’t need to type:
//.....

Commenting

Comment / **uncomment** the line(s)

```
// (the current line)

/* (line 1)
     (line 2)
          .........
            (many lines)
*/
```

Statement and Compound Statement (Block)

- Statement
  - Expressions can be made into a statement by a suffixing semicolon, e.g.

```
y=x+1;
```

- Compound Statement (Block)
  - The compound statement is enclosed within braces **{ }** and treated as a single entity, e.g.

```
{
   int x=1, y;
   y=10+x;
}
```

Why we use **header** files in C

```
#include <stdio.h>

int main( )
  {
    printf( "Hello World!" );
  }
```

You might be wondering why you need to #include xxxx**.h** files and why you would want to have multiple **.c** files for a program.

(1) It **speeds up compile** time.

(2) It keeps your code more **organised:**
If you separate concepts into specific files, it's easier to find the code you are looking for when you want to make modifications.

(3) It allows you **to separate interface from implementation.**

Difference between using angle brackets < > and quotes " "

```
# include <filename>
# include "filename"
```

- For #include <filename> the preprocessor searches in a directory pre-designated by the compiler, to include **standard library header** files.
- For #include "filename" the preprocessor searches for the included file **in the same directory,** normally to include **<u>header files that you defined</u>**.
- Set the PATH of a file: e.g., **#define PATH "**C:\\aaa\\my_header.h"

Exercise

printf in C

```
#include <stdio.h>

int main()
 {
        printf("Book information.\n");
                                //    \n means "go to the next line"
        printf("\nNo.[1] \n");
        printf("Author: John \n");
        printf("Title: C Programming \n");
        printf("Page number: 189");
     return 0;
 }
```

- **C** > empty project (for Visual Studio) > .txt saved as **.c**
  > include stdio.h (for ***printf***) and write your codes

Flowchart Symbols

Symbol	Name	Function
	Start/end	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectangle represents a process
	Decision	A diamond indicates a decision