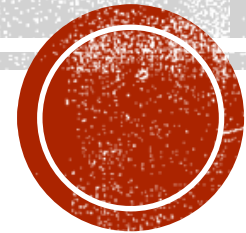




Lebanese University
Faculty of Information
Data Science

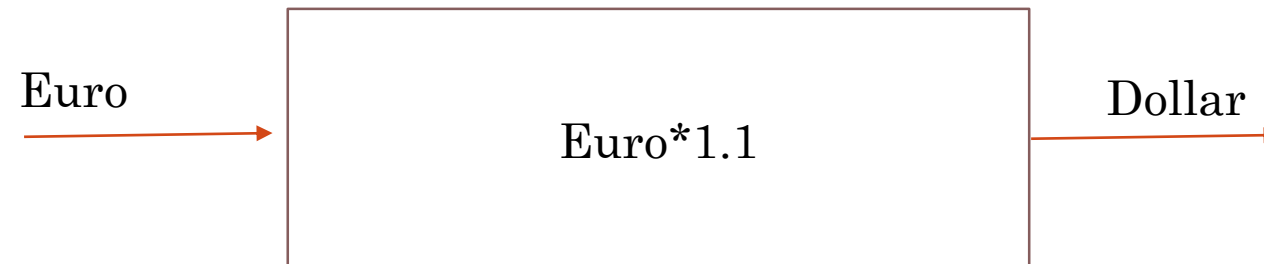
INTRODUCTION TO PROGRAMMING



Dr. Youssef ATAT
youssef.atat@ul.edu.
lb

INTRODUCTION

- Algorithm: set of instructions to solve a problem
- It takes inputs and provides outputs



INTRODUCTION

- Algorithm: pseudocode. Similar to everyday english
- Programming language : C language
- .c, .cpp (file source)
- Compile



- run

LIBRARIES: FILE IDENTIFICATION

- C / C ++ requires different types of files:
 1. .C: C source file
 2. .CPP: C ++ source file
 3. .OBJ: compiled file
 4. .EXE: compiled and linked files (executable versions)
 5. .LIB: precompiled function libraries
 6. .H: header files for using libraries in a program

Header files

Main program

math.h

stdio.h

```
#include...  
#include...  
#include<math.h>  
#include<stdio.h>  
  
main()  
{  
    ...  
}
```

Compiler

Compile code
of the main function

math.lib

stdio.lib

Linker

.exe

Executable program

VARIABLES

- Location in memory where value can be stored
- The variable names are any identifiers.
- Types
 - **int** - integer numbers
 - **char** - characters
 - **float, double** - floating point numbers
 -

IDENTIFIERS

- The names of variables in C are composed of a series of letters and numbers.
The first character must be a letter.
The symbol '_' is also considered a letter.
- The set of usable symbols is: {0,1,2, ..., 9, A, B, ..., Z, _, a, b, ..., z}
- The first character must be a letter (or the symbol '_')
- C distinguishes upper and lower case letters, as follows:
`Variable_name` is different from `variable_name`

IDENTIFIERS

EXAMPLES

Correct identifiers	Incorrect identifiers
name1	1name
name_2	name.2
_name_3	-name-3
Variable_name	Variable name
Deuxieme_choix	Deuxième_choix



INPUT/OUTPUT

OUTPUT: PRINTF/COUT

- `printf(" message ");`
- C++: `cout<<" message ";`

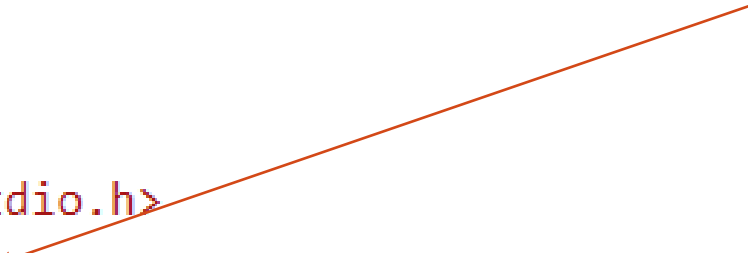
PRINTF AND THE <STDIO.H> LIBRARY

- The printf function is part of the standard <stdio.h> function library that handles data inputs and outputs.

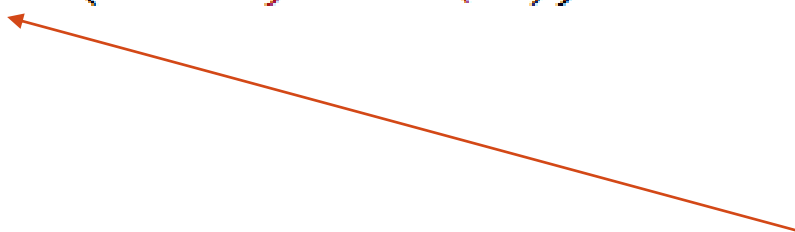
- The first line of the program:
`#include <stdio.h>`
instructs the compiler to include the header file 'STDIO.H' in the program text.

```
#include <stdio.h>
void main()
/* My first program in C */
{
    printf("hello, world\n");
}
```

main function



printf function



HELLO C++!

- HELLO.CPP program:

```
#include <iostream>
```

```
using namespace std;
```

```
int main ()
```

```
/* Notre premier programme en C++*/
```

```
{
```

```
cout<< " hello , world ";
```

```
return 0 ;
```

```
}
```

Header files: manage the instructions of input and output

Starting point of a program
main function

A comment

Output instruction and part of stdio.h:
display on the screen:
hello , world

Indicate that a program is finished
with success

INSTRUCTIONS

- In C, any simple instruction is terminated by a semicolon; (even if it is in the last position in a block of instructions).

```
#include <stdio.h>
void main()
/* My first program in C */
{
    printf("hello, world\n");
}
```

```
cout<<"hello, world\n";
```

instruction

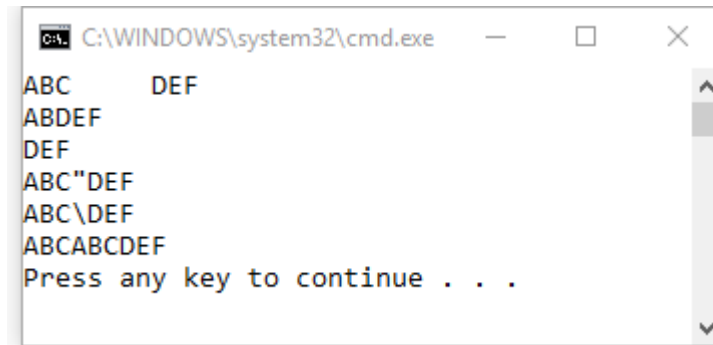
EXERCISE

- Change the hello world program to get the same result on the screen by using the `printf` function several times.

EXERCISE

- Experiment with the escape sequences you find in the table below and fill in the blank columns.

```
#include <stdio.h>
void main()
// My first program in C
{
    printf("ABC\tDEF\n");
    printf("ABC\bDEF\n");
    printf("ABC\rDEF\n");
    printf("ABC\"DEF\n");
    printf("ABC\\DEF\n");
    printf("ABC\0DEF\n");
    printf("ABC\aDEF\n");
}
```



A screenshot of a Windows command prompt window titled "C:\WINDOWS\system32\cmd.exe". The window displays the output of the C program, showing the results of various escape sequences: "ABC DEF", "ABDEF", "DEF", "ABC\"DEF", "ABC\\DEF", "ABCABCDEF", and "Press any key to continue . . .".

EXERCISE

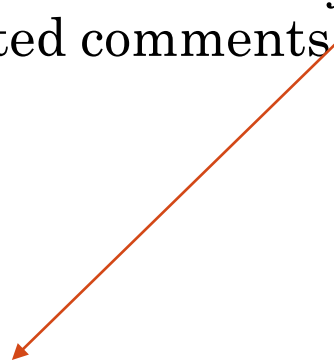
- Experiment with the escape sequences you find in the table below and fill in the blank columns.

Escape sequences	Description
\n	new line
\t	tabulator
\b	back
\r	return
\”	quotation marks
\\	back-slash
\0	NUL - end of string
\a	attention (bell)

COMMENTS

- A comment on **one or multiple lines** always starts with the two symbols `/*` and ends with the symbols `*/`. It is forbidden to use nested comments. Comment

```
#include <stdio.h>
void main()
/* My first program in C */
{
    printf("hello, world\n");
}
```



COMMENTS

- A comment on **one line** always starts with the two symbols //.

```
#include <stdio.h>
void main()
// My first program in C
{
    printf("hello, world\n");
}
```

Comment



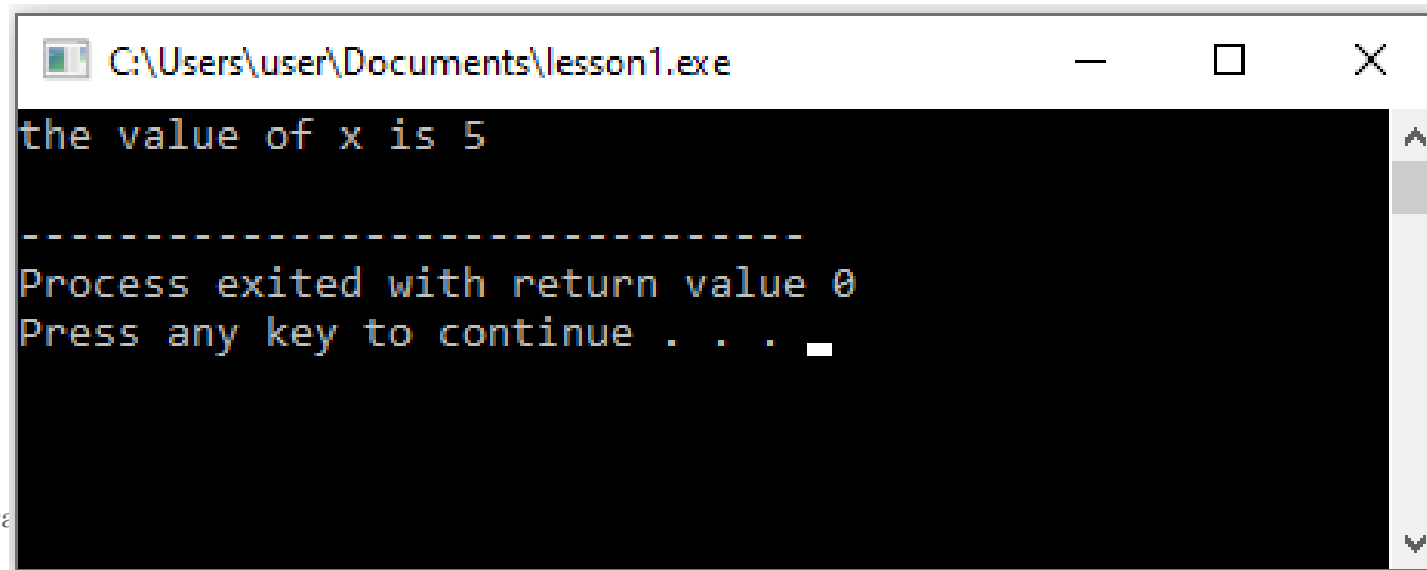
PRINTF : TO DISPLAY A VALUE

- To display the value of a variable:
 - %d integer
 - %c char
 - %f float
 - %lf double

PRINTF

```
#include<stdio.h>

void main() {
    int x;
    x=5;
    printf("the value of x is %d \n",x);
}
```



A screenshot of a Windows command prompt window titled "C:\Users\user\Documents\lesson1.exe". The window has standard Windows window controls (minimize, maximize, close). The output displayed is:

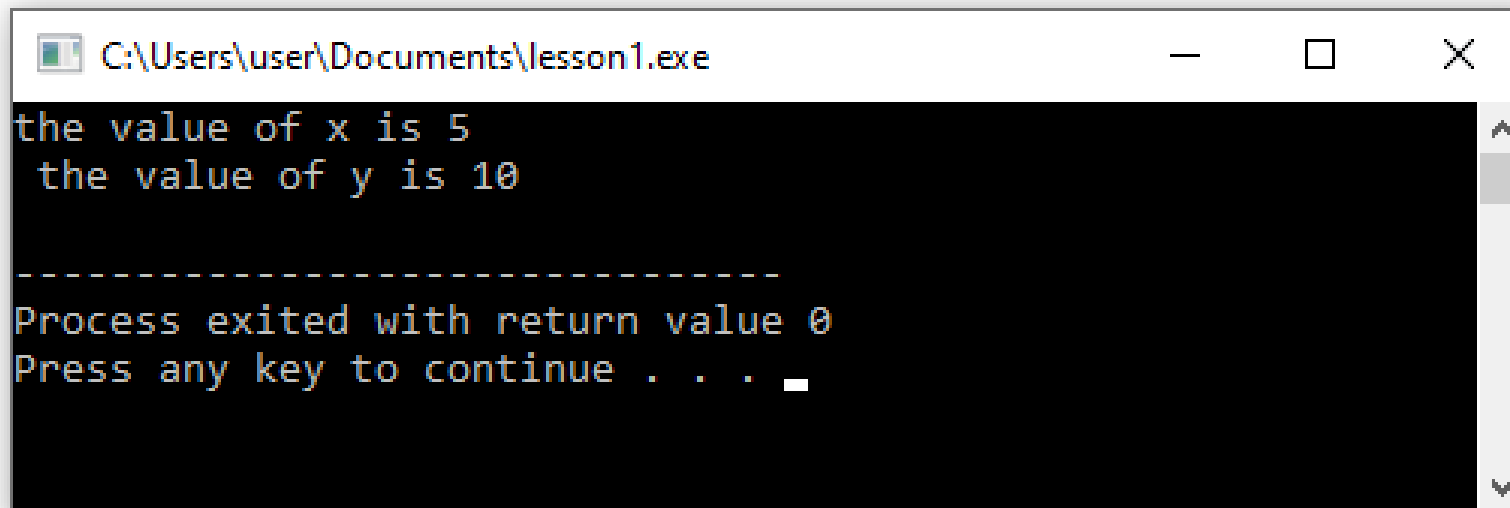
```
the value of x is 5

-----
Process exited with return value 0
Press any key to continue . . .
```

COUT

```
#include<iostream>
using namespace std;
void main() {
    int x;
    x=5;
    cout<<"the value of x is "<<x<<"\n";
}
```

```
#include<stdio.h>
void main(){
    int x,y;
    x=5;
    y=10;
    printf("the value of x is %d \n the value of y is %d \n",x,y);
}
```

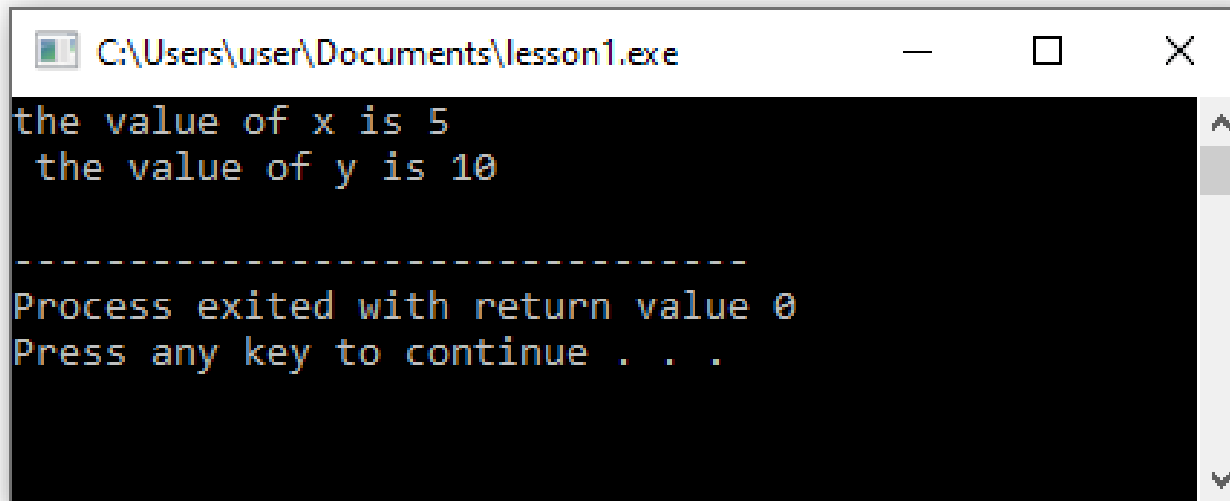


A screenshot of a Windows command prompt window titled "C:\Users\user\Documents\lesson1.exe". The window has standard Windows window controls (minimize, maximize, close). The output of the program is displayed in a monospaced font on a black background. It shows the values of x and y, followed by a dashed line, the message "Process exited with return value 0", and a prompt "Press any key to continue . . .".

```
C:\Users\user\Documents\lesson1.exe
the value of x is 5
the value of y is 10

-----
Process exited with return value 0
Press any key to continue . . .
```

```
#include<iostream>
using namespace std;
void main(){
    int x,y;
    x=5;
    y=10;
    cout<<"the value of x is "<<x<<"\n the value of y is "<<y<<"\n";
}
```

A screenshot of a Windows command prompt window. The title bar shows the file path "C:\Users\user\Documents\lesson1.exe". The window has standard minimize, maximize, and close buttons. The command prompt displays the output of the program: "the value of x is 5" followed by "the value of y is 10" on the next line. Below this, there is a dashed line, followed by "Process exited with return value 0" and "Press any key to continue . . .". The text is displayed in a monospaced font on a black background.

```
C:\Users\user\Documents\lesson1.exe
the value of x is 5
the value of y is 10

-----
Process exited with return value 0
Press any key to continue . . .
```

INPUT: SCANF, CIN

- To assign a value for a variable entered by the user from the keyboard
- Example:

```
int x;  
scanf("%d",&x);
```

```
int x;  
float y;  
scanf("%d%f",&x,&y);
```


CIN

```
int x;
```

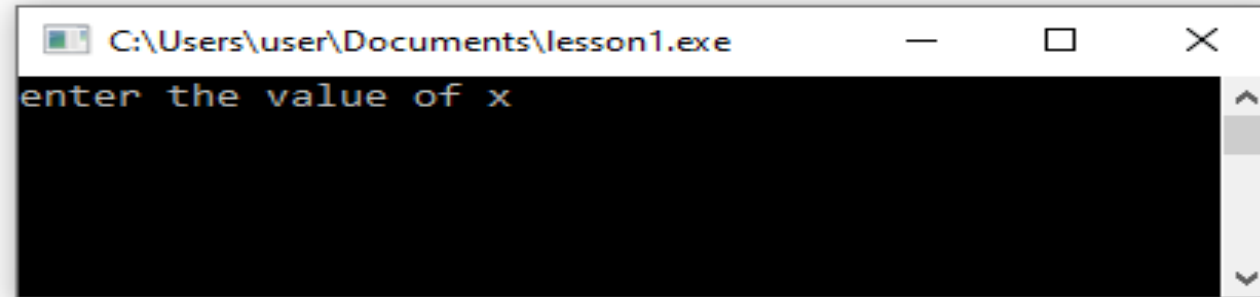
```
    cin>>x;
```

```
int x;
```

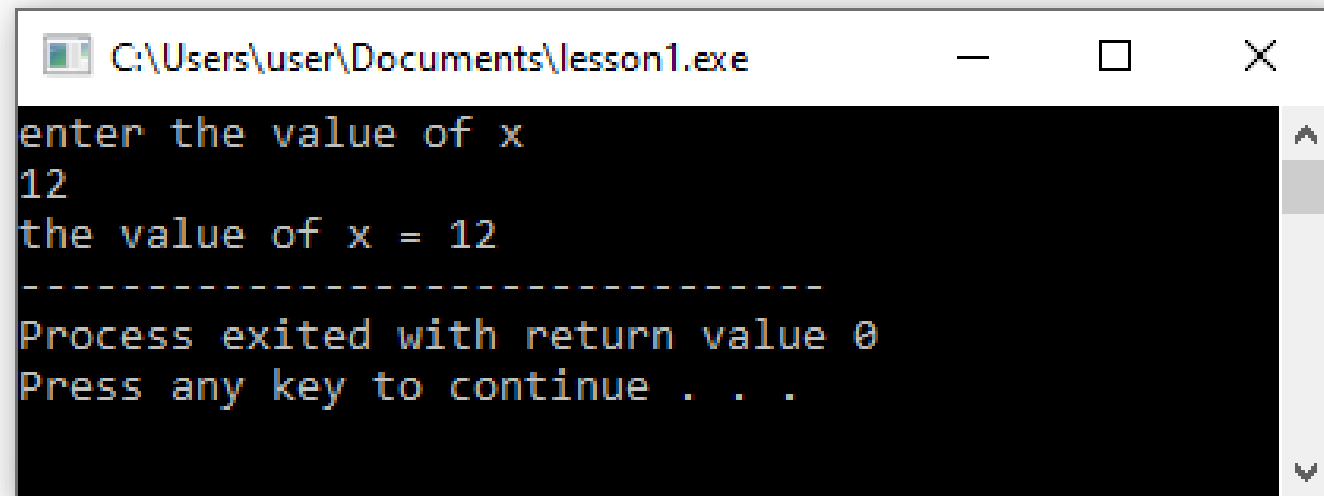
```
float y;
```

```
    cin>>x>>y;
```

```
#include<stdio.h>
void main() {
    int x;
    printf("enter the value of x\n");
    scanf("%d",&x);
    printf("the value of x = %d",x);
}
```



```
C:\Users\user\Documents\lesson1.exe
enter the value of x
```



```
C:\Users\user\Documents\lesson1.exe
enter the value of x
12
the value of x = 12
-----
Process exited with return value 0
Press any key to continue . . .
```