

Introduction to Scientific and Engineering Computation (BIL 102E)

LECTURE 5

1

HANDLING STANDARD I/O

A file is a set of related characters and numbers.

It could be seen as a series of bytes. A series of bytes is also called as a stream.

There are 3 pre-opened file streams in C:

1. **stdin** – the standard input for reading (keyboard)
2. **stdout** – the standard output for writing (screen)
3. **stderr** – the standard output for writing error messages (screen)

For example, printf normally uses standard output stream.

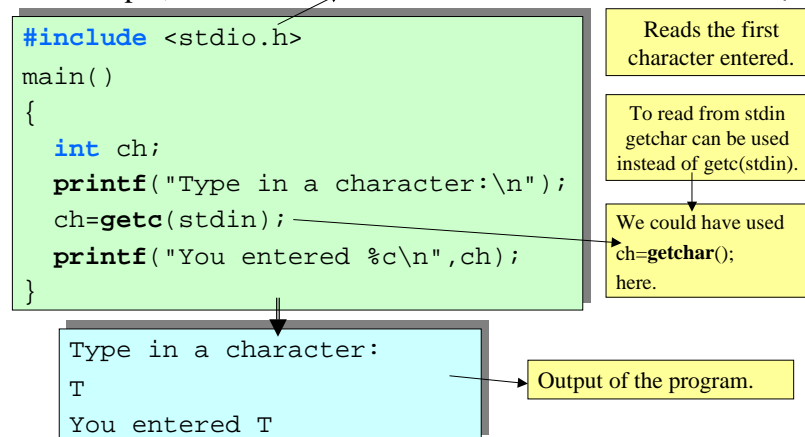
In some operating systems it is possible to change the standard input and standard output file streams.

2

Getting Input from the User

In order to read a character from a file stream the **getc()** function can be used. The syntax is **getc(FILE *stream)**.

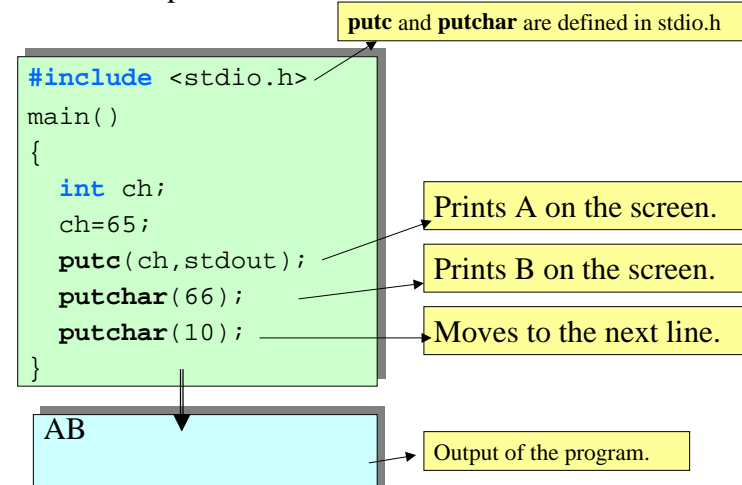
For example,



3

Printing Output on the Screen

Similar to **getc()** and **getchar()** there are **putc()** and **putchar()** functions to print characters in a file stream.



4

printf() Function

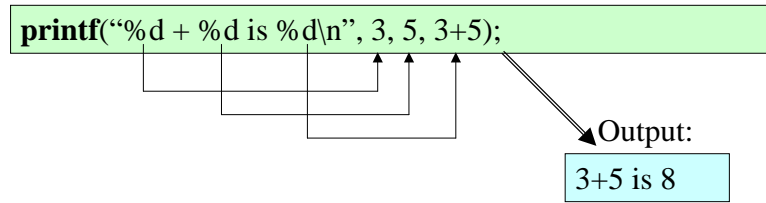
printf() function is used to print formatted output.

The syntax is as follows:

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

```
int printf(const char *format-string, ...);
```

Here format-string is a character string that may contain *format specifiers*. For example,

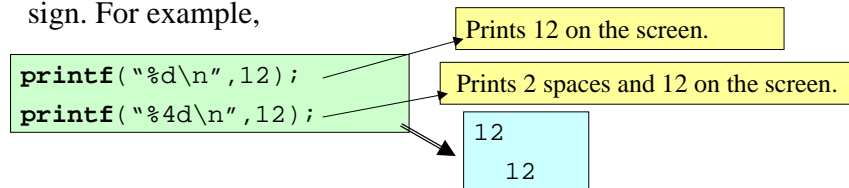


Format specifiers

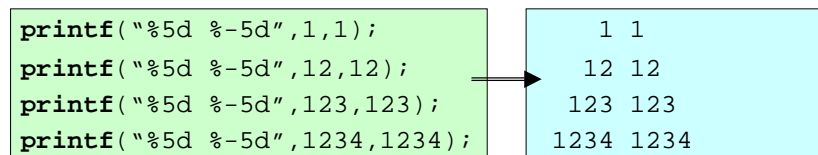
%c	Character
%d	Integer
%i	Integer (same as %d)
%f	Floating-point
%e	Scientific notation (lower-case e is used)
%E	Scientific notation (upper-case E is used)
%g	%f or %e (whichever is shorter)
%G	%f or %E (whichever is shorter)
%s	Null terminated character string.
%x	Hexadecimal format
%o	Octal format
%%	Outputs a percent sign (%)

Aligning Output

It is possible to determine the minimum field width in a format specifier by using an integer just after the percent sign. For example,



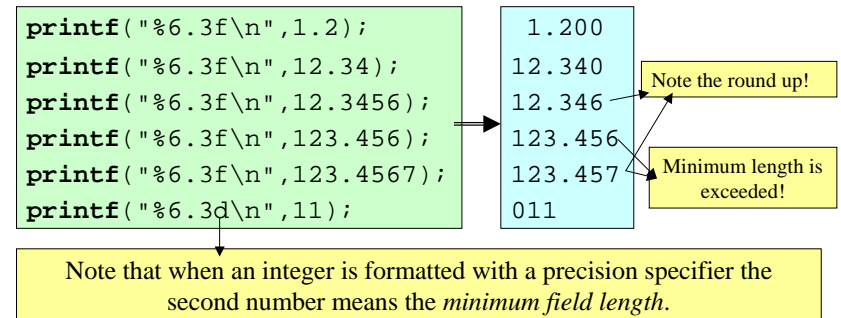
By using negative integers it is possible to left align output.



The precision specifier

It is possible to determine the precision of the floating point numbers to be shown on the screen. This is done by using %n1.n2f format specifier. Here n1 is an integer that determines the length of the output and n2 is the number of decimal digits to be used after the dot(.).

For example,



scanf() function

scanf() function is used to read formatted input.

The syntax is as follows:

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

```
int scanf(const char *format-string, ...);
```

```
#include <stdio.h>
main()
{
    int age;
    printf("Your age: ");
    scanf("%d",&age);
    printf("Age : %d\n", age);
}
```

Your age: 17
Age : 17