

Input

In any programming language input means to feed some data into program. This can be given in the form of file or from command line. C/C++ programming language provides a set of built-in methods to read given input and feed it to the program as per requirement.

Some Common Input functions of C/C++ environment:

| Function | Purpose |
|---------------------------|--|
| <code>scanf()</code> | Reads/input any formatted type of data / value from the user |
| <code>gets()</code> | Reads/input a String data/value from the user |
| <code>getche()</code> | Read/input a character with echo from the user |
| <code>getch()</code> | Read/input a character without echo from the user |
| <code>getchar()</code> | Read/input a character from the user with buffer. |
| <code>cin >></code> | Reads/input any type of data / value from the user using input streaming |

Output:

In any programming language output means to display some data on screen, printer or in any file. C/C++ programming language provides a set of built-in functions to output required data. we can use `printf, puts` to display the value of `<Stdio.h>`

Some Common Output Functions in C/C++ `<stdio.h>` header library file:

| Function | Purpose |
|-----------------------------|--|
| <code>void printf()</code> | Use to Display data of any formatted data type |
| <code>void puts()</code> | Display a string of characters to the screen |
| <code>void putchar()</code> | Prints the character passed to it on the screen and returns the same character. |
| <code>cout <<</code> | Print the any type of data on the screen using output streaming. <code><iostream.h></code> |

Example-1 : *printf()* & *scanf()*:

```
#include <stdio.h>
#include <conio.h>
void main()
{
    int x;                                // Desired Location ,named "X" of integer data type
    clrscr();
    printf("Enter an integer: ");         //To display text onto screen
    scanf("%d",&x);                       // To save an integer value@ location "x"
    printf("\n Integer you Entered is: %d", x); // Integer you Entered is : 5(say)
}
```

Example-2:

```
#include <stdio.h>
#include <conio.h>
main()
{
    int dec = 5;                          // Location "dec" stored integer value 5
    char str[] = "abc";                    //Location "str" stored string value "abc"
    char ch = 's';                          //Location "ch" stored a single character 's'
    float pi = 3.14;                       //Location "pi" stored a float value 3.142
    clrscr();
    //It will display integer value first, then string value, then float then character
    printf("%d \n %s\n %f \n%c\n", dec, str, pi, ch);
}
```

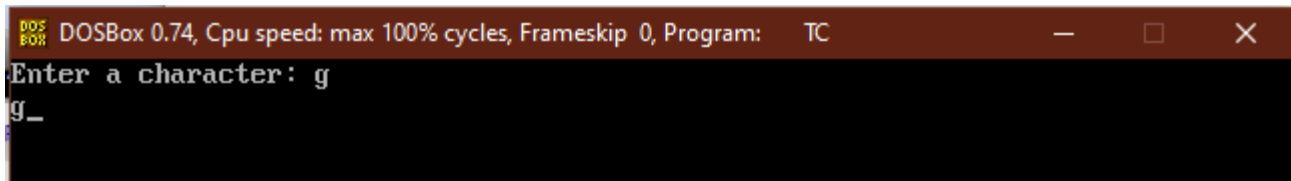
Explanation:

Here %d is being used to read an integer value and we are passing &x to store the value. Here & indicates the address of variable x. This program will prompt you to enter a value. Whatever value you will enter at command prompt that value at the screen using *printf()* function.

printf will displayed data in sequence as you directed since %d will used to print an integer value so first value (after double quotes) should be declare integer (*int*) similarly the next format specifier is %s so the second value (after double Quotes) should be declare string (*char* with []) and so on.

Example-1 : *getchar()* & *putchar()*

```
#include <stdio.h>
#include <conio.h>
void main( )
{   char c;
    clrscr();
    printf("Enter a character");
    c=getchar();
    putchar(c);
}
```



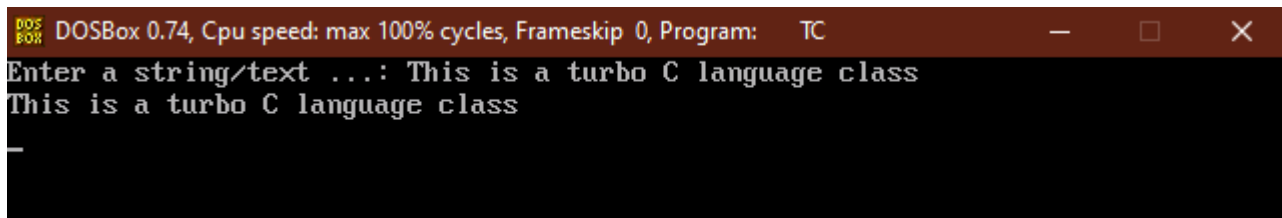
```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
Enter a character: g
g_
```

Explanation:

Both *getchar()* and *putchar()* are used to read(input) or print a single character respectively. *getchar()* allow user to input one character that will stored at location “c” variable whereas *putchar()* will print whatever you stored at “c” variable onto the screen.

Example-1 : *gets()* & *puts()* functions

```
#include<stdio.h>
#include<conio.h>
void main()
{ char str[100];           // Location "str" variable reserves 100 bytes to store a string
  clrscr();
  printf("Enter a string/text...: ");
  gets(str );
  puts(str );
}
```



```
DOS
BOX DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
Enter a string/text ...: This is a turbo C language class
This is a turbo C language class
```

Explanation:

Both *gets()* and *puts()* are used to read(input) or print a string of characters respectively. *gets()* allow user to input a string or text that will stored at location “str” variable whereas *puts()* will print whatever you stored at “str” variable onto the screen.

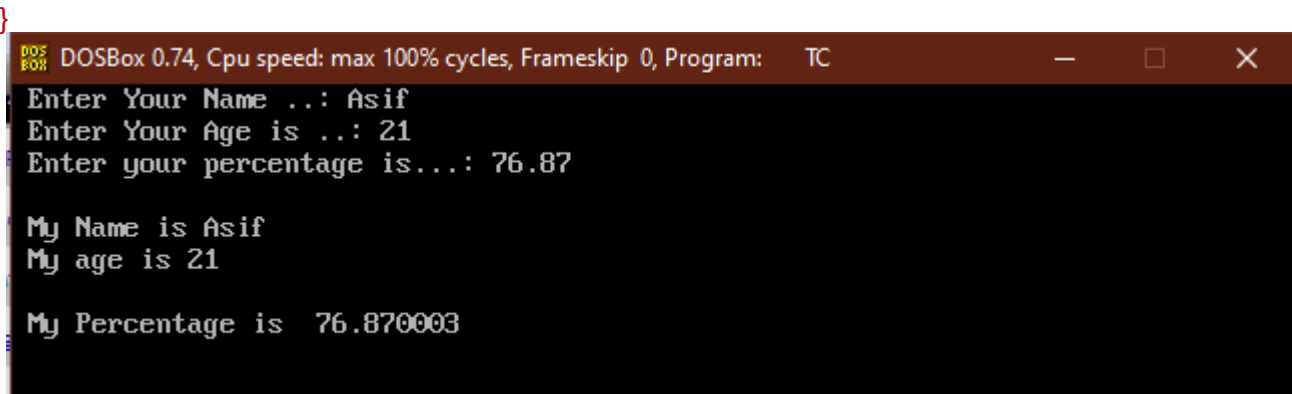
Difference between *scanf()* and *gets()*

The main difference between these two functions is that *scanf()* stops reading characters when it encounters a space, but *gets()* reads space as character too. If you enter name as Study Tonight using *scanf()* it will only read and store Study and will leave the part after space. But *gets()* function will read it complete.

Example-1 : cin << & cout >>

```
#include <iostream.h>
#include <conio.h>
void main()
{
  int age;
  char name[25];
  float per;
```

```
clrscr();
cout << " Enter Your Name ... ";
cin >> name;
cout << " Enter Your Age is ... ";
cin >> age;
cout << " Enter your percentage is...: ";
cin >> per;
cout << " \n My Name is " << name ;
cout << " \n My age is " << age << "\n\n";
cout << " My Percentage is " << per;
```



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
Enter Your Name ..: Asif
Enter Your Age is ..: 21
Enter your percentage is...: 76.87

My Name is Asif
My age is 21

My Percentage is 76.870003
```

Explanation:

Both `cin >>` and `cout <<` are used to read(input) or print any type of data respectively. `cin >>` allow user to input name , age and percentage that will stored at location “name, age and per” variable whereas `cout <<` will print whatever you stored at “*name, age and per*” variable onto the screen. Here we cannot use format specifier. Remember we should be include `<iostream.h>` for use `cin >>` and `cout <<` keywords.

Exercise

Theory Questions

1. Describe the three input function of C/C++.
2. Describe the two output function of C/C++.
3. What difference b/w the *scanf()* and *gets()* function.
4. What difference b/w the *getch()* and *getche()* functions.
5. define *getchar()* and *putchar()* functions.

Practical Questions

- 1) Write a simple C/C++ program of following output using *scanf()* and *printf()* function:

Enter Student Name: Muhammad

Enter Student G.R #: 102

Enter Class: 1styear

Enter Section: A

// Output should be display on the screen.

Name is: xxxxxx

Gr. Number is: 999

Class is: 1st year

Section is: A

- 2) Write a program to input radius and calculate area of circle (Formula: $\text{Area} = \text{PI} \times \text{Radius}^2$).
- 3) Write a C code to input your name and age after input display name and age value on the screen using by *cin >>* and *cout <<* keywords.

Objective MCQ's

- 1) Which of the following function to input only a character with buffer.
 - a) *getchar()*
 - b) *getche()*
 - c) *scanf()*
 - d) *gets()*
- 2) Which of the following header file should be include if we use *cin >>* and *cout <<* keyword for data input and output.
 - a) *<stdio.h>*
 - b) *<conio.h>*
 - c) *<iostream.h>*
 - d) *<stdlib.h>*

- 3) Which of the following functions use for input any formatted type of data without formatted specifier.
- a) gets()
 - b) scanf()
 - c) printf()
 - d) cin >>
- 4) Which of the following function display only string data with new line.
- a) puts()
 - b) printf()
 - c) putchar()
 - d) cin
- 5) Which of the following function to input only a character with echo.
- a) putchar()
 - b) getche()
 - c) scanf()
 - d) gets()