

Welcome students, the course title that I will be covering today is programming fundamentals using C, and in today's session I will be covering the module basic input output which belongs to the Unit 5.

That is overview of. See the outline of this topic is used basic IO functions in C. Formatting the input and output data. What will be the learning outcomes? So at the end of the course you will be able to use basic input output functions in C and learn formatting the input and output data. Now what do we mean by basic

input and output functions? Now when a programmer says input, it would mean that we are feeding some

data or information in the program. We are giving input. They can give this input from the

command line or in the form of any file. That is, whenever we want to give an input to our program,

we are giving from the command line. Or we are giving in the form of any file. C programming provides a set of built-in functions to read the given input and feed it to the program as per the requirement.

On the other hand, when a programmer says output, that means we want to display something,

right? So like if we have written a program, the output has to be displayed somewhere, so they mean by displaying some data and information either on the printer, the screen or any other file.

So C programming also provides a set of built-in functions. To output the data on the computer

screen as well as to save in the text or binary files. So there are mainly two types of IO

functions available in the C language, so these input and output functions are available in two types that

is formatted and unformatted. Now what is the meaning of formatted? The formatted functions basically

present or accept the available data, that is, the input in a specific format. So we follow a particular format for it. The standard library in C contains various functions for the input and output operations like this can

find printf out of these functions. Help a programmer. Moment the functions in their desired

format so we can give a particular format like if I want to print. This is the sum of a,

so I can give the format like. You know this is the sum and then print the value.

Now what is the meaning of unformatted? Unformatted functions are not capable of controlling the format

that is involved in writing and reading the available data. Now some of the examples are getchar.

Putchar, gets and puts. These are called as unformatted input output functions because they do not accept data or they do not. Print input or output in any particular format.

Now we have to know certain terms. That is the standard files. All C language programs treat all the devices in the program in the form of files. Thus, every display devices also addressed the same way.

The program addresses a file. So when a program starts executing, the following three files get opened up automatically for providing the program with access to the devices screen and computer.

So your standard file in the form of standard input standard output standard error will open.

And these are the file pointers that is in for the keyboard. Out for the screen and STD error for your screen, so these are the file pointers that will be opened now.

What are the file pointers? The file pointers are the means to access the file for reading and writing purpose. That means for input and output. So this section I will explain how to read values from the screen and how to print the result on the screen. Now another term that is

the format specifier. We use the format specifier when we are trying to print the values available with different data types with the use of printf. So in formatted type of input output functions like printf and scanner, we need a format specifier which will tell what type of data type we are

either printing or we are accepting as input. So we also use this format specifiers when taking the input from the user with the use of the scanner function. So this is for taking input and printf for output.

It is because here we must let the program know what type of input it should be expecting from its user, whether it is an integer type. Floating point or character? So format specifier tells you that. So these are the different format specifies which are available for int. It is % d for int ,%c for character and for double it is IF ,for float it is %f. So these are the list of format specifiers and the data types that are there.

So you have to use this format. Specify as when you are expecting certain type of data from the user or you are displaying an output to the on the screen. Now these are another two symbol specifiers that is slash D used by the program for tab space. So when you're printing something, you want a space between your data, you have to use slash T. If you want your output to be displayed on the next line,

then you use a slash north, so used by a program for a new line. No. So now we will see output with

printf so printf function is part of the standard C library is perhaps the most versatile way for

a program to display data on screen. Now the printf function basically gets defined in the header file

IO dot H and so to use printf function in your program you have to include the header file.

And we use it for showing the standard output. The output available on the console. Now printing a text message on screen is simple, so we just call the printf function and we pass the desired message enclosed in double quotation marks. I will show you an example. So for example to display an error

message that has occurred on the screen, the user writes the following printf in double quotation marks.

You write the sentence and this will be printed on the screen. That is an error that has occurred.

Now in addition to. Text messages. We also frequently need to display the value of a program variable.

That is, if you have written a program to add to numbers or to subtract or to find a prime number

you want to display that result so that result also can be displayed. Now what happens is it accepts a string parameter called the format string, which specifies a method for rendering a number of other parameters of which are typically may be arbitrarily many of various of variety of types into a string.

I will give you an example now for example. The user wants to display the value of the numeric variable X on screen along with some identifying text. He wants the information to start at the beginning of a new line, so this is how you will do so. I want that this line should be printed on a new line, so I start with printf open code, open brackets, put a quotation marks north, so Slash North will tell that it has to be on a new line. Then next the sentence which has to be displayed, that is the value of X is and %d is the format. Specifier, which tells that we are printing an integer value and close the quotes comma

and \*\* is the value that will be printed. So slash north represents a new line character. The resulting screen display, assuming that the value of X is 12, would display the following. The value of X is 12,

so this will be printed on the screen. In this example, 2 arguments are passed to printf, so if you see there are two arguments, the first argument is enclosed in double quotation marks. North is called as the format string. This one the value of X is called as the format string. The second argument is the name

of the variable X containing the value to be printed, and we use the format specifier person D to print an integer. So another example is supposing you want to print a character, so we have to use the format specifier person see. So this is an example. You include the header file int main character age is equal to 40. So how will the printf look in double quotation today is bernadine's birthday and she is. This is called

as a format string. Person C is the format specifier. So whatever is in the double quotation marks will be printed. Comma H is the one which has the value. 40 and 40 will be printed, so the output will be.

Today is Bernadine's birthday and she is 40. Printing a double end float so you only have to remember that the print types takes the format string or format specifier and the value to be printed.

So here we use the format specifier percent F for the float value and the format specify a person I for the double value. Now in pain with the use of printf so double NUM and float NUM. These are the two variables which have those values. So we are using two printf. The value of NUM 11 is percent F.

The output would be the value of NUM 11. Is this and 2nd printer the value of NUM 22 is percent if NUM 22,so whatever value is in NUM 22 will be printed which is 15. So the output generated is

displayed on the screen. Printing of multiple outputs with the use of printf for multiple outputs in the program. We can print more than one value. All this while I have shown you printing just one value using one format specifier. So if you see here I am printing the date so int here int month and in today so printf today's date is. So when I want to print multiple outputs. So what I am doing I am using three format

specifiers in a row without any comma. Person D. Percent D, percent D and I have put a hyphen in between,so that also will be displayed and close it in double quotation marks, comma, year, month, and day. So the output generated will be. Today's date is and it will replace personally all the three format

specifiers with the year, month and day. So just to summarize, a printf takes a format string.

The format specifiers in double quotation Marks and after the comma the values to be printed.

Taking input with scan F, just as program need to output data on the screen. They also need to input

data from the keyboard.So scanner is basically used to take input from the user. So the most flexible way the program can read numeric data from the keyboard is used by using scanf library function.

The scanner function reads data from the keyboard according to a specified format and assigns the input

to one or more program variables. So for example, I want to read a decimal integer from keyboard. So what is this? Format specifier to read an integer. It is person D, so I just use scan F in double quotation,

person D, comma and X. So the percent indicates the conversion specification that follows.

D represents the data type and indicates that the number should be read as integer, and ambition in C is a unary operator that gets the memory address of the variable following it. So North X is the address at which the from which the value has to be read. So we will read more about this operator and it's.

Associated operator in the second section, that is, pointers in this course. Likewise, the following statement reads a floating point value. So you will say scan F percent F to read a floating point comma,

use the unary operator and rate. So this will read the data and store it in rate. Now we go to the unformatted IO function, so we have get care put care are used to transfer single characters when

we want to read a single character, and we want to output a single character and get us.

Inputs are used to input and output string. That is when we want to read a string and when we want to output an entire string. So this is how a get care function works. So get care is used to read 1

character at a time from the keyboard. So syntax is you declare a character Ch, so you are using a printf enter. A character Ch is equal to get care. So get care, will read only one character and it will wait for a key to be pressed. So when I press type a character and press enter, the value will be read and it will be stored in the character Ch. So getchar, Please remember is used to read 1 character at a time. Put care is used to display 1 character at a time. So I use putchar ch is equal to M, so when I say put care Ch, the computer displays the value of character variable Ch that is M on the screen. Now just get as function is used to read an entire string of characters. Please remember get care for one character and get As for the entire string. So note that white spaces in a string cannot be read using scanf with percentage format specifier. Hence the syntax here is get South where South is a character string. So when this function is executed, the computer waits for the string to be. Entered put us is a function used to display the string on the screen. For example, character 20 Hello will be displayed. Now what is the difference between

scan F and get as the main difference between these two function? Is that scan F stops reading character

when it encounters a space but get as reads space as a character too. So if you enter text like programming language using scan if it will only take programming and leave the part after the space but guess get as reads the entire string that is programming language. These are the references.

Thank you.