

## Practical # 02

### C Building Blocks (I/O and Data Types)

#### **OBJECT**

*To study basic building blocks of C-language such as data types and input-output functions.*

#### **THEORY**

This Lab is concerned with the basic elements used to construct C elements. These elements includes the C character set, identifiers, keywords, data types, constants, variables, expressions statements and escape sequences.

#### **Comments:**

Comments statements will not to be compiled. Comments are simply the statements to improve program readability and to document program properly. Comments begins with /\* and end with \*/ , text is placed in between them.

*/\* Lab Session 2(a) \*/*

#### **printf() Function:**

This function is used to output combination of numerical values, single character and strings.

#### **Syntax:-**

```
printf ( "fomat specifier", variable or constant);  
printf ( "text");
```

#### **Examples:-**

```
printf ( "Area of circle is %f sqmm", 3.756);
```

#### **scanf() Function:**

The purpose of *scanf()* function is to except data from keyboard, and place that data to a memory location specified in its argument.

#### **Syntax:-**

```
scanf( "fomat specifiers", address of variable);
```

#### **Examples:-**

```
scanf( "%d", &r);
```

#### **Escape Sequences:**

These are non printing characters. They are special character set, each with specific meaning. An escape sequence always begins with a back slash and is followed by one or more special characters.

Table 2.1  
Escape Sequences

Escape Sequence	Meaning
\n	New Line
\t	Horizontal Tab
\a	Alert(Bell)
\\	Back Slash
\"	Quotation Mark
\f	Form feed
\r	Carriage Return
\0	Null

### **Variables:**

A variable name is a location in memory where a value can be stored for use by a program. All variables must be defined with a name and a data type in the code before they can be used in a program.

A variable name in C should be a valid identifier. An identifier is a series of characters consisting of letters, digits and underscore and does not begin with a digit. C is case sensitive i.e. area and Area can not be treated as same.

There are certain reserved words called *Keywords* that have standard, predefined meanings in C. These keywords can be used only for their intended purpose; they can't be used as programmer defined identifier.

### **Data Types:**

C supports several different types of data, each of which may be represented differently within the computer's memory. The basic data types are listed below.

Table 2.2  
Data Type and Storage Allocation

Data Type	Meaning	Bytes
char	Character	1
int	Integer	2
short	Short Integer	2
long	Long Integer	4
Unsigned	Unsigned Integer	2
Float	Floating	4
Double	Number(Decimal) Double Precision Floating Point Number	8

### **Format Specifiers:**

Format specifier specifies that which type of data has to be print or read into. Following is a list of different format specifiers.

Table 2.3  
Format Specifiers

Specifiers	Meaning
%c	Character
%d	Integer
%f	Float value
%e	Float value in exponential form
%u	Unsigned Integer
%x	Hexadecimal integer (unsigned)
%o	Octal value
%s	String

**Example:**

Now consider a Simple C program.

```

/* Lab Session 2(a) */
#include<conio.h>
#include<stdio.h>
void main (void)          /* Defining main function*/
{
    clrscr();              /* Clears previous contents of screen*/
    int r;                 /* Declares a variable of type integer */
    float area;            /* Declares a variable of type float */
    float Pi=3.14;         /*Initializing a variable of type float */
    printf("\t\t\tEnter the radius of circle:"); /*Output the
string on the screen*/
    scanf("%d", &r); /*Stores the value on the address of variable
r*/
    area=Pi*r*r;           /*Evaluating area and assigning the value to
variable area*/
    printf("\n\n\t\t\tArea of Circle is :%0.3f ",area);
    getch();
}

```

Even though this program is simple, it illustrates several important features of C language.

**Output:**

```

Turbo C++ IDE
Enter the radius of circle in mm:12.65

Area of Circle:452.160 mm^2

```

## Review Questions/ Exercise:

### 1. Identify and correct errors in the following statements.

a) `scanf("d", value);`

In this section module or % is missing in first part and in second part we have address &; operator is missing

So the correct statement is here:

`scanf("%d",&value);`

b) `printf("The answer of %d+%d is"\n,x,y);`

In this section or part of question we have mistake in printf statement like if we are writing :

Wrong: `printf("The answer of %d+%d is "\n,x,y);`

Now we have a correct form:

`Printf("The answer of %d+%d is\n",x,y);`

Answer is : `x+y;`

c) `scanf("%d%d, &number1,number2);`

In this section or part of question we have missed the &; address operator of second number , number 2 and didn't use the off of double quotation

Correct:

`Scanf("%d%d",&number1,&number2);`

### 2. Write a single C statement to accomplish the following tasks.

a) Prompt the user to enter an integer in the inverted commas.

For example "Enter an integer" .

Answer : `printf("\nEnter an integer\n");`

b) Read an integer from keyboard and store that value into a variable a.

Answer:

`int a;`

`scanf("%d",&a);`

c) Read an integer from keyboard and store that value into variable a & b.

Answer:

`int a,b;`

`printf("%d%d",&a,&b);`

### 3. What does these code print?

a) `printf("\n*\n**\n***\n****\n*****");`

**Answer:**

In this section or part we have used "\n" for new line and "\*" can be any character or anything so If we will use this code and make it run it will display the answer like this ;

```
*  
**  
***  
****  
***** ;
```

b) `printf("This is \base");`

**Answer:**

In these type of question we have something new or can say that special Here the programmer has used the "\b" which is mainly represents the backspace character and when ever we use it it will remove the the element or character before "\b" so here we have

Printf("This is \base");

**Will become:**

This iase ;

c) `printf("\n\t\t\t1\n\t\t2\n\t\t3\n4\n\t\t5\n\t\t6\t\t\t7");`

```
_____  
1  
_____  
2  
_____  
3  
4  
_____  
5  
_____  
6_____  
7
```

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**Remarks:**