

Assignment No:-2

classmate

Date _____

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C Programming

Q) What is Programming Language? what are features of C programming language?

→ **Programming Language :-**
It is a formal set of instructions that can be used to produce various kinds of output most commonly in the software programs.

- Programming Languages are used by developers to write code that is translated into machine-readable instructions, which can then be executed by a computer's hardware.

• **Character Features of c programming language.**

① General purpose programming language :-
By using c we can create any kind of software.

② Procedural Programming Language :
we can used c language to write the program in format of procedures (functions).

③ Blocked structured programming Language :-
Everything in c programming gets return inside the block.

④ Free Flow :-

Allowing the program to jump between different parts of the code based on conditions, loops or function calls.

⑤ Native programming language :

the language interact with os directly.

⑥ Standardized :

C language Standardized by multiple standardization

I Q.2] What is mean by Data Type? What are the data types available in C programming language.

- When we execute any application we need some it loaded into RAM.
- Inside every application we need some memory locations to stored the values.
- To stored the value we can create the **Variable**.
- Before creating a variable we have to decide its type i.e. **Data Type**.
- * Data type in programming language is a classification that specifies the type of data a variable can hold. It defines the operations that can be performed on the data, the structure of data, and how much memory is required to store it.
- Data Types are classified into three types:
 - 1] Primitive Data Type (milk) created by designer.
 - 2] Derived Data Type (curd)
 - 3] User defined Data Type (icecream)

1] Primitive Data Types:-

- **Integer (int)**: Represents whole numbers, positive, negative without decimal points (e.g. 3, -42)
- Size of int is 4 byte (4 bytes)
- **Float (double)**: Represent real numbers with fractional parts using decimal points (e.g. 3.14, -0.00)
• **Double**: Stored decimal point in variable which contains more digits after a decimal point
- Size of double is 8 byte (e.g. 88.80000)

- **character (char)**: Represents single characters. Size of char is 1 byte. (e.g. - 'A', 'a', 'g')
- **Boolean**: Represents Truth values. typically True or False , 0 or 1. size of boolean is 1 bit.
- **Void**: can't create a variable for data type void

2) Derived Data Types:-

- **Array**: A collection of elements of the same data type stored in contiguous memory location.
- **Pointer**: Holds the memory address of another variable, allowing indirect access to that variable.
- **Functions** :- named block which contains the set of instructions

3) User - Defined Data Types:

- ① **Structure**
- ② **Union**
- ③ **Enumeration**.

Q3) What is mean by user defined data type list out user defined data types in c programming language.

→ User defined data types in c are data types that are defined by the programmers, Rather than being predefined by the language itself.

-These types allow you to create more complex and customized data structures that better represent the data you want to work with.

① **Structures**:

The structure is a composite data type that groups together variables of different data types under a single name. Each variable in the structure is called a member or field.

② Unions (Union):

The Union is similar to a structure, but in a union, all members share the same memory location. This means a union can only store one of its member's values at a time, and the size of the union is determined by the size of its largest member.

③ Enumerations (Enum):

An enumeration is a user-defined type consisting of a set of named integer constants. It's useful for creating symbolic names for values, which makes code more readable.

Q4] What are the primitive data types in C and what are their sizes?

→ Primitive Data type is a data types which are provided by the language designer.

Types of primitive Data Type

- ① **char:** Size is 1 byte (8 bits).
- ② **int:** Size is 4 bytes (32 bits).
- ③ **float:** Size is 4 bytes (32 bits).
- ④ **double:** Size is 8 bytes (64 bits).
- ⑤ **Boolean:** Size is 1 bit.

Q5] What is mean by identifier?

→ An identifier in programming language is a name used to uniquely identify a variable, function, array, or any other user-defined element within a program.

It act as a reference to that element, allowing the programmer to access and

manipulate it within the code.

Q6] What is mean by data type qualifiers?

→ Data type qualifiers in programming, are keywords used to modify the properties of data types. They provide additional information about the storage and behavior of variables.

Qualifiers are used to specify characteristics such as the variable's memory storage, whether it is read-only or if it has specific alignment requirements.

• Common Data Type Qualifiers in C++

① const

② volatile

③ static

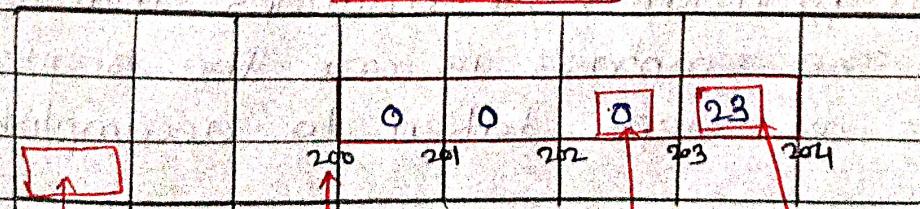
④ auto

⑤ register

Q7] Explain the concepts of data object and its L.value, R.value.

→

`int age = 23`



L.Value
(Base Add)
(Home Add)

Data
Object

Residential
Value (R.value)

Visualization of RAM.

- Data object :-

It is a region of storage in the computer's memory that holds a value.

Data objects are created when variables or constants are declared and are used to store and manipulate data during program execution.

L.Value : Represents an object that occupies a specific location in memory and can be used on the left side of an assignment.

It has an address.

- L.Value locates its location.

R.Value : Represents a value or constant and can be used on the right side of an assignment. It does not have a persistent address.

The data we stored in the variable is called as its R.Value or residual value.

Q8] List out the different types of programming languages with examples.

There are three types of programming language

① **Procedure-Oriented Programming Languages:-**

Focuses on procedures or routines that operate on data. The emphasis is on the sequence of actions or steps taken to accomplish a task.

example :- C, Pascal.

② **Object-Oriented Programming Languages:-**

Centers around objects, which are instances of classes. These languages use principles such as encapsulation, inheritance, and polymorphism to design and organize code.

example:- C++

③ Virtual Machine - Based Programming Languages.

These languages run on a virtual machine, which provides an abstraction layer between the code and underlying hardware.

The VM interprets or compiles the code at runtime, enabling features like portability and runtime safety.

example:- Java, python.

Q9) What is mean by data Type modifier?

→ Data type modifier in programming, particularly in languages like C and C++, are keywords that modify developers to fine-tune the size and behavior of data storage.

-They extend the basic data types to allow for a greater range of values or to optimize memory usage.

Common Data Type Modifiers

- 1] short - Reduce storage size of an integer data type.
- 2] long - Increase storage size of an integer data type.
- 3] Signed - Indicate that a variable can store both positive & negative values.
- 4] unsigned - Specifies that a variable can only store positive values.

10] Read below code snippet and draw its diagrammatic layout.

char division = 'A' ;

int age = 20;

float marks = 67.09;

double value = 90.12345678;

bool a = True;



Diagrammatic Layout :-

division

age

A	20
100 104	200 204

marks

Value

67.09	90.123456789
300 304	400 408

a

True

500 504