Assignment 2.

1] What is Programming Language ? Features of C PL?

→ PL : Considered as a language, which is used to interact/communicate with computer.

- If we want to perform any task with help of computer that we have to interact it with it in it's language (binary).

Def^n : Program is considered a text file, which contains the instructions, written in programming language.

✱ Features of C

1] General Purpose :
- we can write/create any type of software app^n.

2] Procedural programming :
- Used to write a program in format of procedures.

3] Block Structured (C & Java) :
- Everything in C programming gets written inside a block → { }

4] Compiled Programming Language :
- compiler is used

5] Free Flow :
- Inside app^n we can transfer flow from 1 pt to another point.

6] Statically typed:
- Provides inbuilt data types.

7] Native PL :
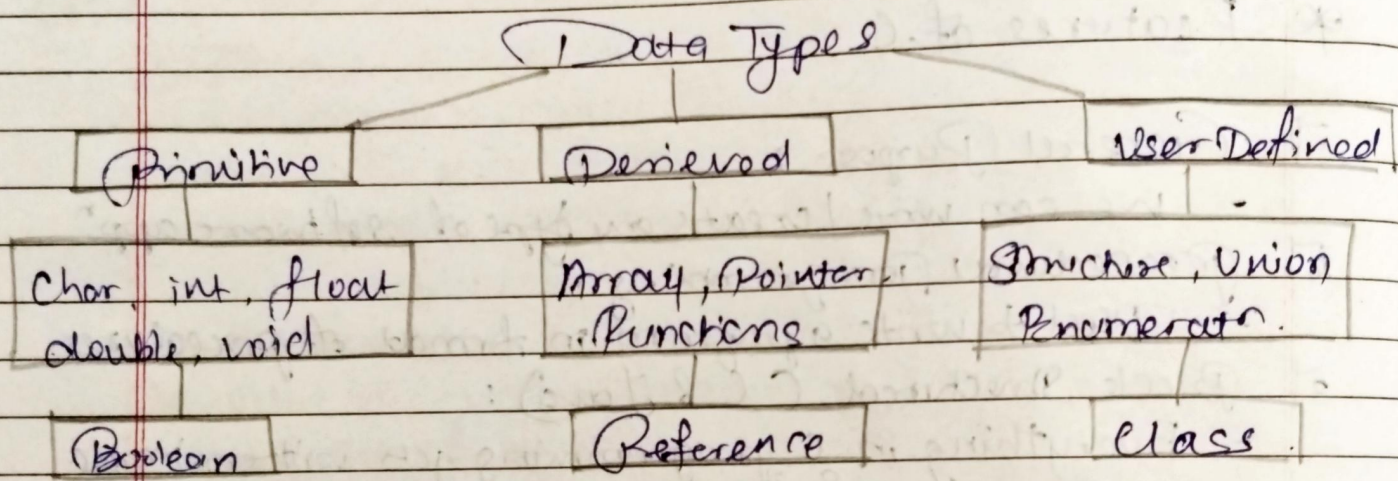- Interacts with OS directly.

8] Standardized :
- By multiple org^n (K&R, ANS, ISO, C-99)

2] What is meant by Data Type? Types available in C?

→
- When we execute any operation it gets loaded in RAM
- Inside every app'n program we need some memory locat'n, to store values, for this we have to create a variable.
- Before creating variable we have to decide its type i.e. 'Data types'
- Every programming lang provide set of data types we can use in our app'n.

Data Types

Primitive	Derieved	User Defined
Char, int, float double, void	Array, Pointer Functions	Structure, Union Enumerat'n.
Boolean	Reference	Class

(रोटी) 1] **Primitive** : Data types provided by language designer. As a programmer we can create variables of primitive data types directly.

(दही) 2] **Derieved:** : A composite data types that can contain intrinsic & derieved data types.

(icecream) 3] **user-defined** : Data types defined by user (programmer) themself.

3 User defined data types and its list?

→ meaning – Data type derieved from an existing data type. These are defined by user (programmer) themselves.

List :

1) ~~Array : An arrangement of no.s, pictures or objects formatted into rows & columns according to their type.~~

~~In programming – Array is a collection of items, or data, stored in contiguous memory locations known as database~~

1) Structure :: Collection of various types of related information under one name. Declaration of structure forms a template, and variables of structures are known as member.

Keyword : 'struct'

2) Enumeration : Mainly used to assign names to integral constants, the names make a program easy to read.

Keyword : 'Enum'

Set of named integer constants that define all the possible values a variable f that particular type can have.

3) Union : Contains members of different data types & union members share same storage area.

Keyword : 'union'

4) Class : Group of objects with same operations & attributes.

Keyword – 'class' | class < classname>

4. What are (Primitive data types in c & what are their sizes?

→ **Meaning :** The data types which are provided by lang designer. As a programmer we can create variables of primitive data types directly.

1] Char [Character] :
- store a letter (alphabet)
- Size - 1 byte (8 bits
E.g. 'a', 'A', 'a'

2] Int [Integer] :
- Numeric value | E.g. 20, 98
- Size - 4 byte (32 bits) |

3] Float
- Numeric value containing decimal point
- Size - 4 byte (32 bits)
- E.g. 95.80

4] Double
- Decimal points with more digits.
- Size - 8 byte (64 bits)
- E.g. 123.98833

5] Boolean
- can store 1 or 0 (True or False)
- Size - 1 bit

5] What is meant by 'identifier'?

→ - Identifiers are names assigned to different entities such as variables, functions, arrays, etc
- They are reserved words.

Eg. printf, scanf, int, char, struct, etc.

6] what is meant by data type qualifier

→ In C, C++ programming languages a type qualifier is a keyword that is applied to a type, resulting in a qualified type.

Eg. 'const int' is a qualified type representing a constant integer, while int is the corresponding unqualified type, simply an integer.

7] Explain the concept of Data object & its L & R value.

→ - When we create a variable it is considered as 'data object'

- Data object contain 2 things:

1) L.value - Indicates data object locatn, (considered as address of that object in memory (RAM))

2) R.value (Resident value) - data stored inside that variable.

8] List out different types of Programming language with examples

→

```
┌──────────┐
│ PL Types │
└──────────┘
```

Procedure oriented   object oriented   Virtual machine
(   )   (   )   based. (   )

7] Object-oriented PL : Style of programming characterized by identificatn of classes of objects closed linked with methods (functions) with which they are associated.

* Eg. Creating a 'cake' with attributes like 'flour', 'bake', 'icing' along with methods like 'pour', 'add', etc.

5] Procedure Oriented Programming Language:
- derived from structural programming
- Procedure → function, routines or subroutines consist of a series of computational steps that they need to carry out.
  R.g. ① To develop a simple Bank Account - All documents
  ② To make tea

3] Virtual Machine Based Programming
- Compute resource that uses software instead of a physical computer to run programs and deploy apps.
  R.g. Java vm, Linux Process and NBT vm.

9] What is meant by Data type modifiers?
→ - These are special keywords defined in the programming language which are used to modify the default properties of Built-in data types.
- used to modify the range of data types & also memory space allocated to the variable

10] Draw diagrammatic Layout
        char division = 'A';
        int age = 20;
        float marks = 67.09;
        double value = 90.12345678;
        bool a = true;

division   Angle   marks   Value
┌─────────┐   ┌───────┐   ┌─────────┐   ┌─────────────┐
│   A   │   │ 20   │   │ .67.09 │   │ 90.12345678 │
└─────────┘   └───────┘   └─────────┘   └─────────────┘
100   104   200   204   300   304   400   408

        bool   a
        ┌───────┐
        │   a   │
        └───────┘