C Programming
Assignment - 2

Q. What are the characteristics of C programming language?

→

- C programming language is widely used programming language known for its efficiency, flexibility.

- Below are the key characteristics of C programming language

A) Procedural language

C programming language is a procedural language which means it is based on the procedures or functions that manipulate the data. Programs written in C language are composed of series of functions that interact with one another.

B) Portable

C programs are generally portable across different platforms as long as the necessary libraries and compiler support are variable.

This portability of C prog. makes C suitable for developing software that run on different OS and hardware architecture.

C) Efficiency

- High performance capabilities.

- It allows for direct memory manipulation and fine control over system resources, making it suitable for developing software that demands efficient memory usage and processing speed.

D) Rich library support

- provides standard library that contains wide range of functions to perform various tasks.

  - file handling
  - except handling
  - Memory Management

- Additionally, there are many third party libraries available for specific program.

E) Static typing

C is statically typed, means variable types are defined at compile time and more

F) Pointers and Memory
   Management

c allows for explicit memory
allocation and deallocation
using pointers, provides great
control over memory.

G) Structured programming

c supports structured programming
constructs like loops,
conditionals, and functions.
This promotes organized and
modular code design.

H) Widely used in systems
   programming.

c language is strong prog.
language. commonly used for
system programming including
operating systems.

Q What is meant by
   identifier?

→

An identifier is a programm.
language helps to name that
is used to identify the
variable, function, class,
object or any other user
defined entity within a
program.

In simple terms, an identifier
is a unique name that you
assign to element in your
code to make them
recognizable and accessible.

Q What are the data types
available in c programming
language?

→

Inside every Application
program we need some
memory location to store
the values.

To store the values we need
to create the variables.

Before creating the variable
we need to decide its data
types.

- Every programming language
provides set of programming
language that we can use
in our program.

- data types are classified
into three types.

1) Primitive
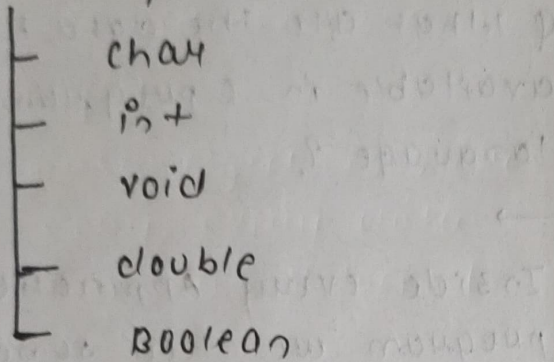
2) derived / non primitive

8) user defined.

1) primitive data types
The primitive data types
are data types that are
provided by the language
they are defined by language

- provided by the language designer are called primitive data type.
- primitive data type consist of
  - char
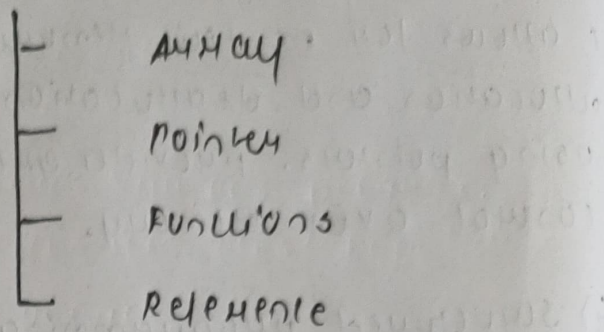 - int
  - void
  - double
  - Boolean

2) derived data type
- derived data type are also called as Non-primitive data-types.
- These are Not defined by the language designer as of primitive data types.
- These data type are constructed by combining existing data type in various ways to create More complex and specialized data structures.

- derived data type are built using the building blocks of primitive and user defined data types.
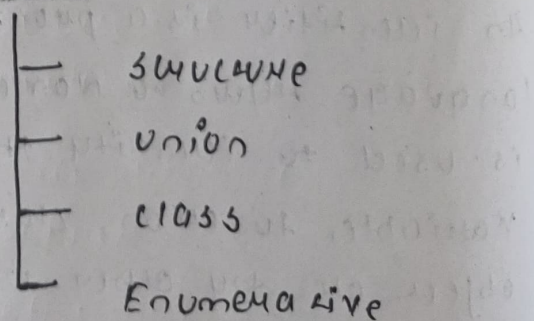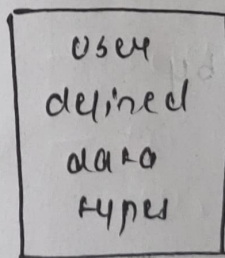
derived data type are
  - Array
  - pointer
  - functions
  - Reference

3) user defined data types.
- custom data types that programmer creates to encapsulate and manage data in More Heanging and structured Hamer.

- Its Non-primitive data type

- used for complex programming.

User defined data type
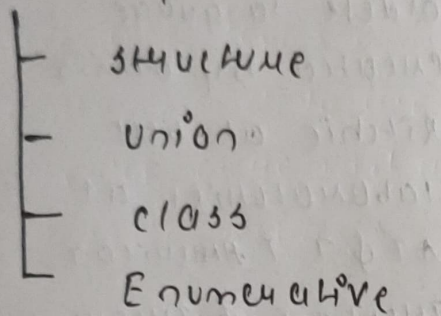
  - structure
  - union
  - class
  - Enumerative

Q which data type comes
under user defined data
types in c?

→

- user defined data types
are custom data types.
- Non-primitive data types
- used for complex
  programming.
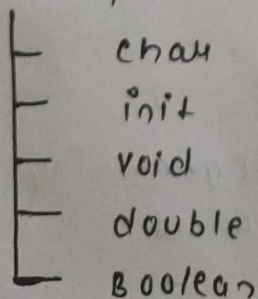
  - structure
  - union
  - class
  - Enumerative

Q What are the primitive
data types in c and what
are the sizes of primitive
data types?

→

- The data types which are
pre-defined are called
primitive data type.

- The data type which are
defined by the language
designer are called primitive
data types.

consist of

  - char
  - init
  - void
  - double
  - Boolean

- If we want to store a
letter (Alphabet) we the
create variable of type
character (char)

size of char = ~~size~~ 1 byte

eg ~~int~~ char = A.

init → 4 byte

If we want to store a
Numeric value then we
create a variable of
type init

size of init is 4 byte

void We cannot create the
variable of type void.

- It doesn't return Anything
- does not return Any
  value, init.

double → 8 byte

If we want to store a
Numeric value which
contains some digits after
the decimal point then we
create a variable of type
double having 8 byte size.

Boolean → 1 byte

Boolean variable can store
either 1 or 0. (True or False)
The size of boolean variable
is 1 bit.

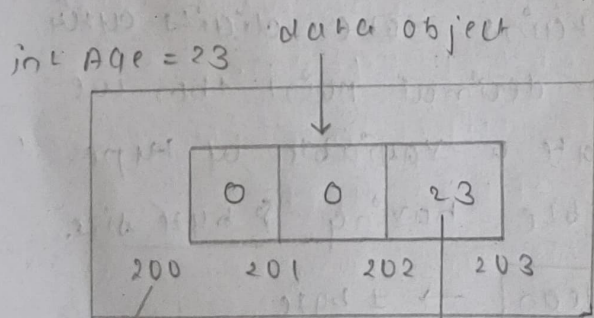**Q** Explain the concept of data object and its L value, R value

→

we create a variable it is considered as a data object.
each data object is store in memory. every data object has two values L and R value

L value indicates the location at which it located in memory. Inshort Address of location is indicated

R value the data we store inside the variable is called the R value. that is Resident value

consider the below example

data object

int Age = 23

```
         ┌─────┬─────┬─────┐
         │  0  │  0  │ 23  │
         └─────┴─────┴─────┘
          200   201   202   203
```

L value
[location]

R value
[Resident]

int Age = 23;
↓
Identifiers.

Q What are the type of programming language?

→

There various program. languages. Most popular languages are
C, c++, Java, python

C = oldest language created by dennis Ritchie at bell laboratories at AT&T [American Telephone & Telegraph].

c has some osm characteristics that are

— Procedural language
— portable
— pointers and memory management
— structured programming
— Rich library support
— efficiency
— system programming and libraries
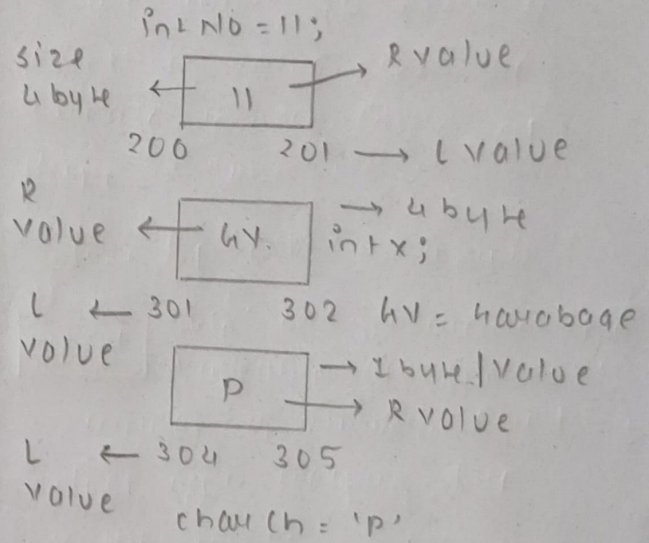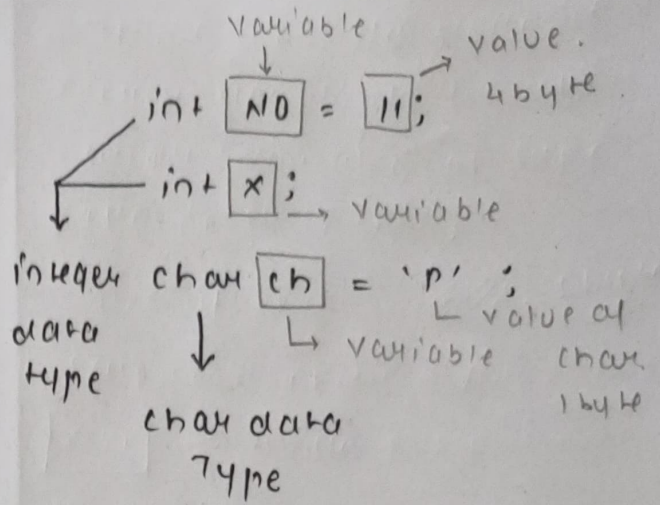
C++ = was developed by
        Bjarne stroustrup.
        It is object oriented
        programming language
whewe as c language is
procedural language
Also known as Advance
version of c language.

- support classes and
  object

- support OOP

- support function overloading

- support template for
  generic programming

- General-purpose programming
  applications.

- Rich and extensive standard
  library.

- C has Manual Memory
  Management where as
  C++ support automatic
  Memory Management.

Q Read below statement
  and draw its diagrammatic
  layout.

        int no = 11;
        int x; *
        char ch = 'p';

---

variable   value.
   ↓   ↗ 4byte
int NO = 11;

int x; → variable
                → variable

integer char ch = 'p';
data   ↓   ↳ value of
type   ↳ variable char
                              1byte
        char data
          Type

int NO = 11;
size   → Rvalue
4byte ←   11
        200   201 → Lvalue

R   → 4byte
value ←   GV.   int x;
L ← 301   302 GV = garbage
value   value
        P   → 1byte Lvalue
                  → Rvalue
L ← 304   305
value   char ch = 'p'

Here GV ⇒ Garbage
            value

- NO, X, P are identifiers
  as variables.

Q What is meant by
  data type Qualifier?
→