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C language notes

VIVA QUESTION

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Define C language / what do you mean by C language?

C language is a programming Language which was developed or designed in USA. in 1972. It is written or designed by Mr. Dennis Ritchie. in Late

Advantage of using C LANGUAGE

- It is reliable, and also simple and easy to use
- Major parts of popular operating System like windows, Unix, Linux are still written in C.
- It is also store more data because it is Case Sensitive Language
- It is a middle level language
- The C language use Compiler or interpreter
- It is based on function
- we can use only 1 main in a program
- * • It is portable Language
- * • And also it is Independent Language

C LANGUAGE

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BASIC

STRUCTURE OF C PROGRAM

- (1) directory
- (2) function declaration
- (3) Global variable declaration
- (4) main () {

}

— Not optional

- (5) function declaration

— optional

* — * — * — * — * — * — *

Structure with Example :-

- (1) directory

include <Stdio.h>



[Standard input output. header]

* — * — * — * — * — * — *

- (2) function declaration

[Explain ahead]

* — * — * — * — *

- (3) Global variable declaration

variable — which value is not fixed

It changes according to Command with respect of time.

Example :-

g = 5 Constant
↓ Variable

* Semicolon, ~~comma~~ [;] - work as a full stop.

* — * — * — * — * — * — *

(4) Main() :- Program Execution

→ Starts with main() and also Ends with main
OR

The program Execution starts from main() and
also ends with main().

- * — * — * — * — * — * — * — *

FUNCTION

Function - is basically a composition of 3 types
of Data

Function → declaration / prototype

Function → Definition / Implementation

Call

Function Says

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- (1) Declaration/prototype → says brief Information
OR
WHAT ?
 - (2) Definition → says How ?
 - (3) Call → Use ?
- * ----- *

BASIC INFORMATION

- (1) C is Case sensitive Language
Example :- RAM & ram
① different ②

There is ~~RAM~~ RAM 1 is different from ram 2
राम ① राम ② से अलग है उनकी लिखावट के कारण

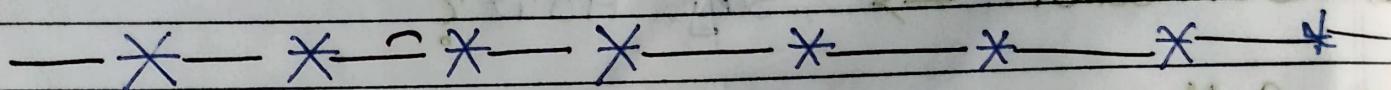
- (2) C language is middle level language
- (3) C language is Developed by Dennis Ritchie
- (4) C language/program uses Compiler + Interpreter
- (5) C language uses ① Compiler for check the program
uses ② Interpreter for Run & Execution the program
- (6) C language is based on function
OR
C language is function based language

(7) Main can only one 1. in 1 program

(8) function in a program is 1 \rightarrow n

(n) is the number of function used

in a program. It may not use as [infinity].
or It is represented by (n).



Symbols Representation

① file < >

newline point 2728

② function ()

③ block/definition { } 110 2837

Why do we USE COMPUTER ?!!

We use Computer for many ways like :-

- ① Media Consumption
- ② Writing Theories
- ③ Video Editing
- ④ Animation
- ⑤ for use internet

But that type of using computer is called Advance user of Computer

* The Main use of Computer — mainly

The basic use of Computer is for Data processing

The main unit in our Computer System is Data processing unit.

X — X — X — X — X — X — X

Data

Processing

Data :-

1. DATA is a RAW Material like ORE.

2. DATA Can be Converted into Information

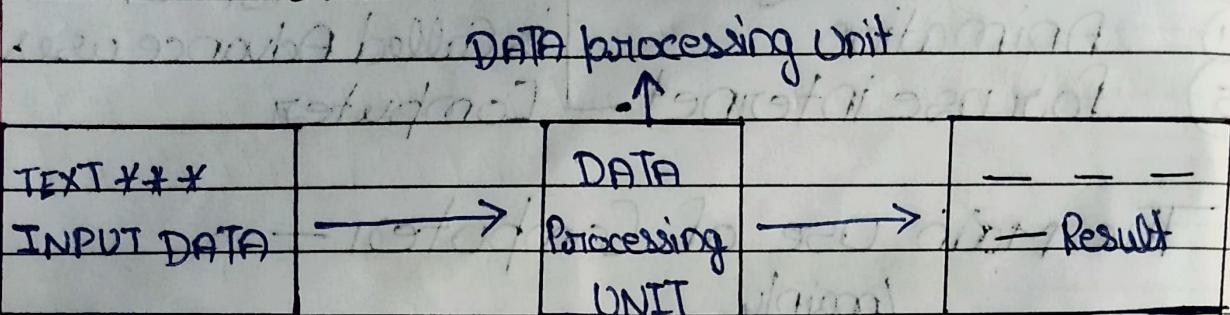
The Converting of DATA into Information is called Processing

The processing is proceeded by
Data processing UNIT
on Computer, process

★ INFORMATION ★

Information is the meaningful thing which is Extracted from RAW DATA

GRAPHICAL REPRESENTATION



DATA Computer Information

DATA PROCESSING

- 1 when DATA Entered in Computer
- 2 than Computer process it
- 3 and give meaningful Result

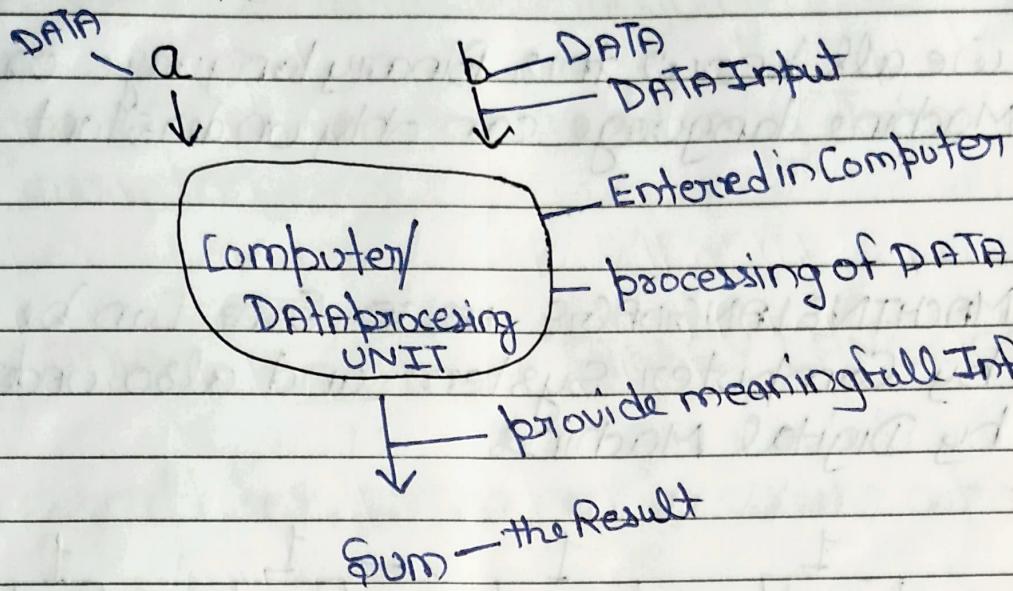
Example —

```
int a;  
int b;  
Sum = a+b;
```

Let take this Example in language where

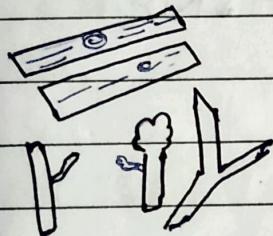
- Q- int a and b is Data and we want to find the Sum of the Data

GRAPHICALLY

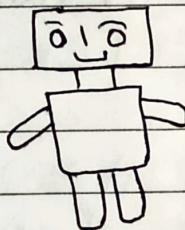


DATA is converted into useful Information with the help of Data processing unit (Computer)

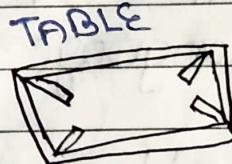
— NATURAL EXAMPLE —



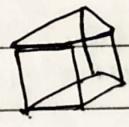
Wood



Carpenter



TABLE



PENCIL
Stand

DATA

Not useful
to us

DATA processing
UNIT

Computer Convert
Data into Information
by performing
specific task

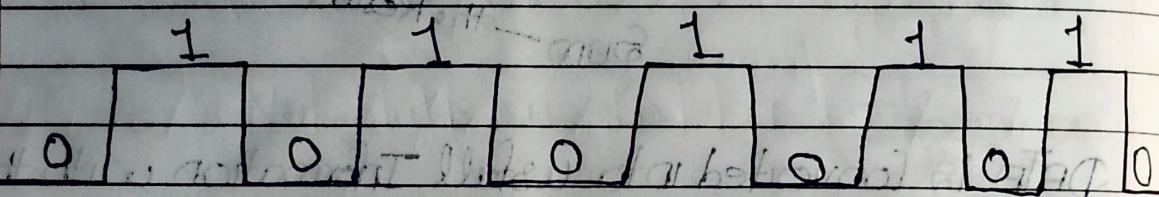
Information

useful
for us

BINARY LANGUAGE | MACHINE Language

We all know this Binary language or Machine language can only understand 0 and 1.

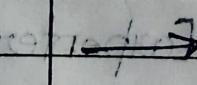
MACHINE LANGUAGE  Can be understandable by Computer System and also understandable by Digital Machines.



Binary Language Graph

* Word OR Sentence is written in Binary Language in 0,1 form or called MACHINE Language.

Example

printf("RAM");		01000011001
In High level Language		In binary language

ADVANTAGES of MACHINE LANGUAGE

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1 binary language is fastest language

because It doesn't need any Translator
to binary language

DISADVANTAGES OF BINARY LANGUAGE

→ It is difficult for programmer to write a program

because binary language is difficult to
learn or understand easily.

→ It is difficult to debug — for Compiler

debug [दृगना]

debug = Identify and remove errors from
program. [Program से से error की निकालना, is called
debugging]

debugging = finding errors from the program
[Program से से error की तुलना is called debugging]

→ MACHINE LANGUAGE / Binary LANGUAGE DEPENDENT
MEAN:-

Binary Language is Dependent on Computer
it's processor that's why this lang. is not portable
for all Computer. ex. Binary Language

because different processors have different
instruction to Run Binary language that's
why Machine lang. is Dependent, So It is
not portable language for All Computer
System.

NOTE

PORTABLE

Independent

m/c. Independent

Portable Independent LANGUAGE

Mean:- All type of Computer processor can run that language.
No variation in Computer processor
Easy to use in any Computer Ex JAVA

→ Binary Language OR machine language is dependent on platform or OS (Operating System)

Not Platform Independent

v. sup Note Example:- If a language is Dependent than it is also not a platform independent language

because If language is Dependent than it depends upon processor or if they depends on processor than we know that Different OS is also having different processor.

MAIN EXAMPLE:- If a program or a language is Dependent, or we use it in windows (Windows) than it can not run programs in MAC or Linux because they have different processor. And we know that different processor are settled with different instruction for Commands.

Explain Example for:-

MACHINE LANGUAGE :- DEPENDENT

INTEL

Instruction
Symbol

+ = 00
- = 01
* = 11
/ = 10

AMD

Instruction
Symbol

+ = 10
- = 00
* = 11
/ = 01

Now if we give two variable to add or sum

	2	3	
In binary	a	+	B
	010110	[00]	110100

this is + symbol
for intel process
- or which 00 in
binary.

$a = 2$
 $b = 3$

In variable $= 5$ 0110110 \leftarrow In binary.

But Now we perform this program
In AMD process [which have different symbol command]

Again sum of two variable :-

2 3

a + B

010110 [00] 110100

$i = 1$ = 0101

Now we can clearly see that the result is not same because Intel and AMD processor have different instruction for binary Command.

ASSEMBLY LANGUAGE

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Assembly language have some symbols
from Mathematical
symbols.

+	→ ADD
-	→ SUB
*	→ MUL
/	→ DIV

→ It is slower in comparison to Machine Language

* ADDING 2 values In Assembly language

$$2 + 3 \rightarrow \text{add}$$

when we use Assembly language, then
the symbols are changed

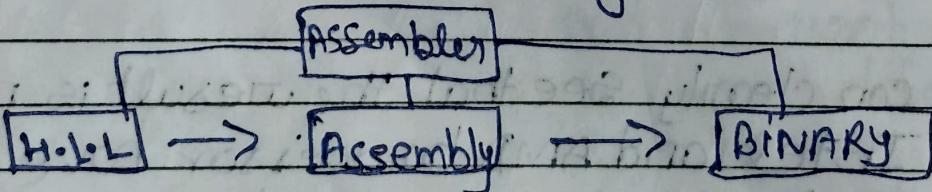
+ into Add

- into Sub

* into Mul

/ into DIV

Then the program first have to be changed by Assembler into Assembly language, and then it changes into binary language



- M/c DepenDent (Not PORTABLE)
- Not platform Independent
- Not EASY to Debugg
- Not EASY to program

High LEVEL language

High level language is like as English Language

A - Z

a - z + ! ? and half form

0 - 9

printed at 128 form

High Level language — features of 128 form

1 It also need translation into Binary/Machine Language

2 It is Portable

3 Easier to read and write.

[because It is similar to English]

4 It is easy to debug

- X - X - X - X - X - X - X -

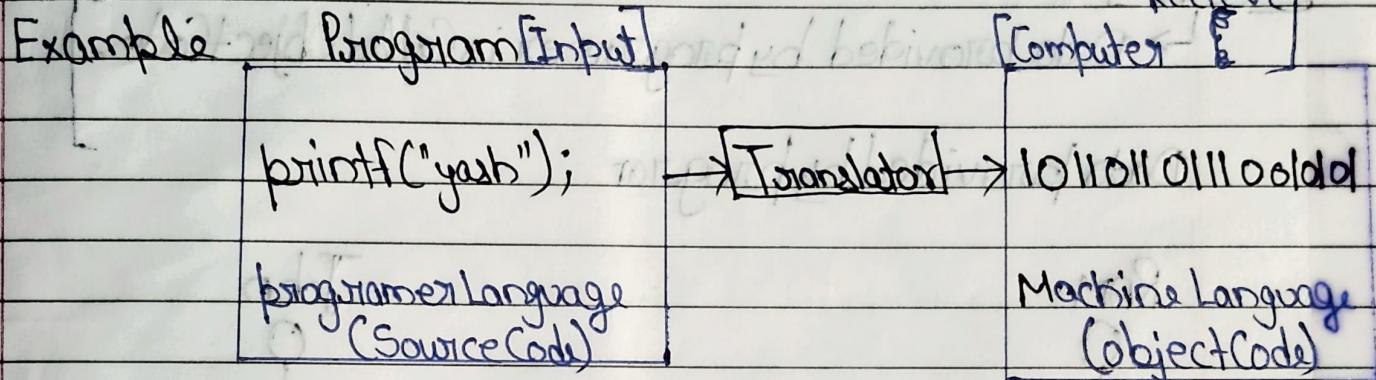
HOW TRANSLATOR WORK?

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The most general term for a Software Code Converting tool is translator.

TRANSLATOR - Converts the human Language / Programmer Language into MACHINE LANGUAGE.



* { TRANSLATOR is a Software }

— x — x — x — x — x — x — x —

Translators :-

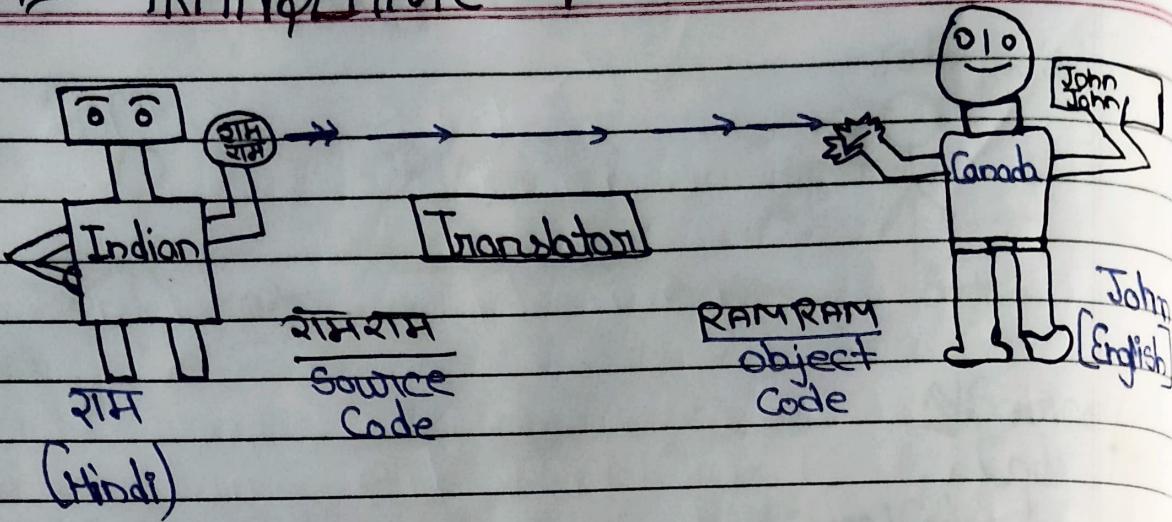
- ① Assembler
- ② Interpreter
- ③ Compiler

Some LANGUAGE & translators

- | | |
|----------|------------------------|
| Lang. | Translator |
| ① C | Compiler |
| ② C++ | Compiler |
| ③ JAVA | Compiler / Interpreter |
| ④ COMBAL | Compiler / Interpreter |
| ⑤ BASIC | Interpreter |

★ TRANSLATOR EXPLAIN ★

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देवी
जॉन

John
John

object
Code
for U.S. by
MC

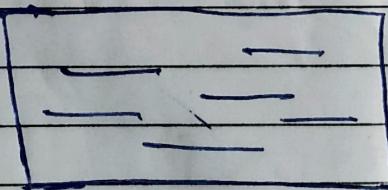
SourceCode
for M.C

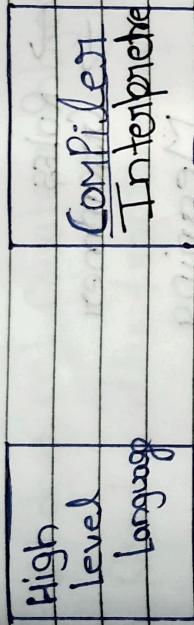
Important Note

* Source Code is Always Saved by .C Extension

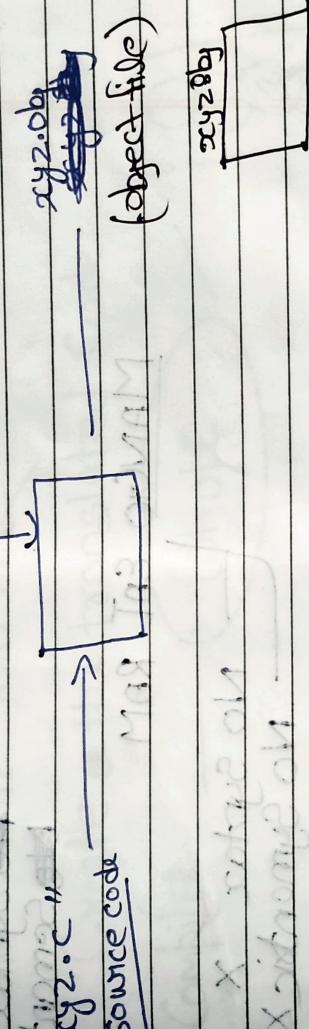


.C





HLL .c
Source Code
Source program



Compiler working

Create a file with xyz2.obj
Read a Single line from file .c
check Syntax error ↴

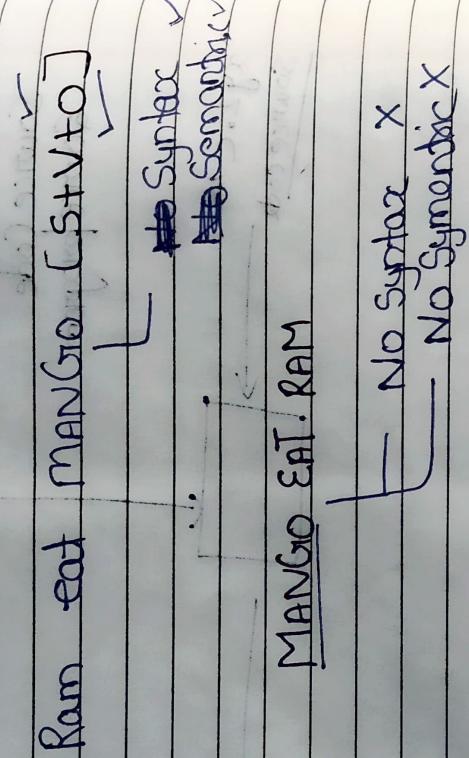
S + V + O ↴

check Semantic error

check runtime error if any

Syntax → Rules
→ Grammar

Semantic Meaning



MANGO EAT. RAM

— No Syntax X
— No Semantics X

TRANSLATE into m/c. LANGUAGE

⑤

write into object file

⑥

execute it in DOS

Repeat

- * object file is not Complete
- * program is responsible to execute the object file
- | Not Compiler

INTERPRETER

It does not Create an object file

Read a line from Source Code

check Syntax Error

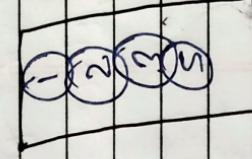
check Semantic Error

TRANSLATE into M/R

Create the translated Code

Compiler

Whole



Interpreter → Line by line