

CS & IT ENGINEERING

C PROGRAMMING

Data Types and I/O Functions

Lecture No.- 02



By- Satya sir

Recap of Previous Lecture



- Data Type?

- defines Nature, memory size, Range of values for data.

- 2 Types : 1) Primary

2) Secondary

- Primary data types : void, char, int, float



Topics to be Covered



- Cyclic Property (wrap-around) of datatypes
- scanf () input function
- printf () output function.





Topic : I/O Functions - 1



Cyclic Property of data types

char x = 130;

Signed Char == char \Rightarrow Range \Rightarrow -128 to +127

Printf("%d", x);

Integer

O/p: -126

\pm [Total values - given value]

$$256 - 130 = 126$$

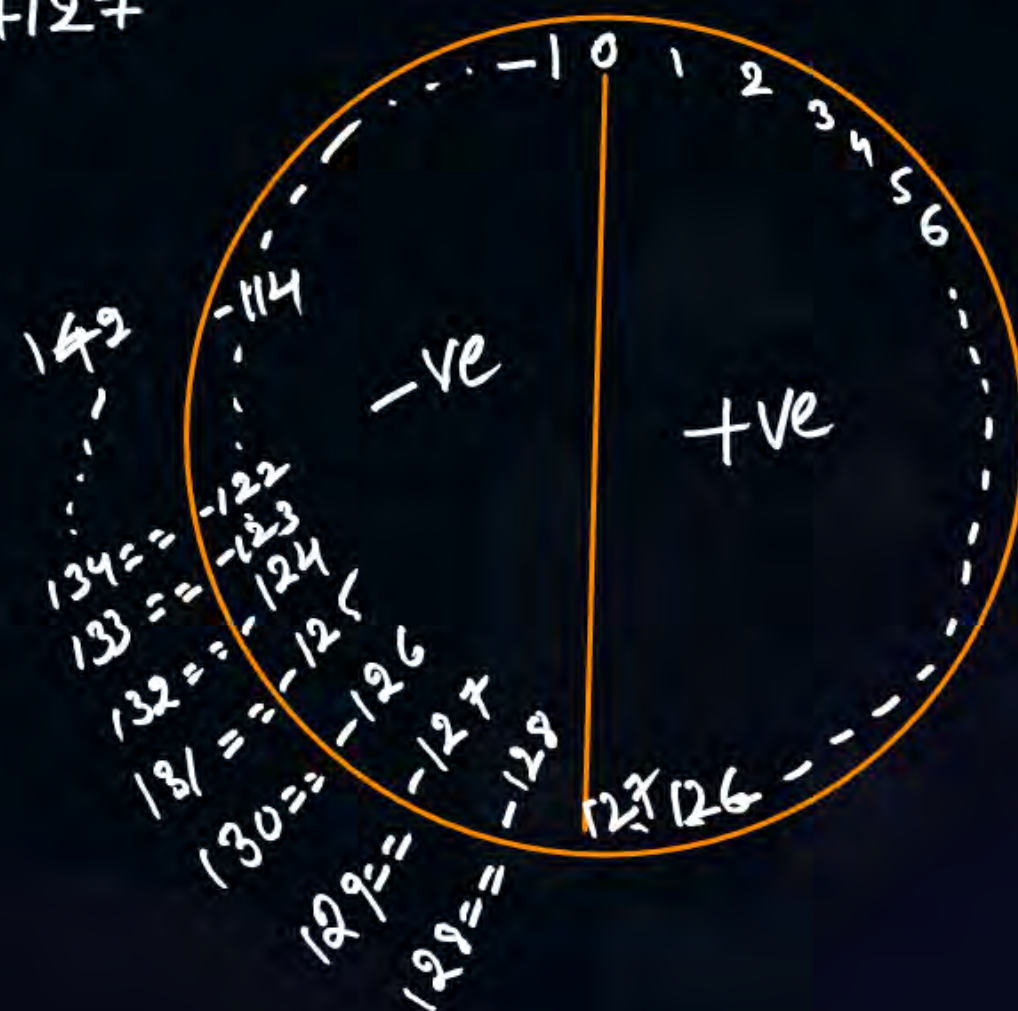
$$\underline{\underline{-126}}$$

char y = 142;

Printf("%d", y);

O/p: -114

$$\begin{array}{r} 256 \\ -142 \\ \hline -114 \end{array}$$





Topic : I/O Functions - 1

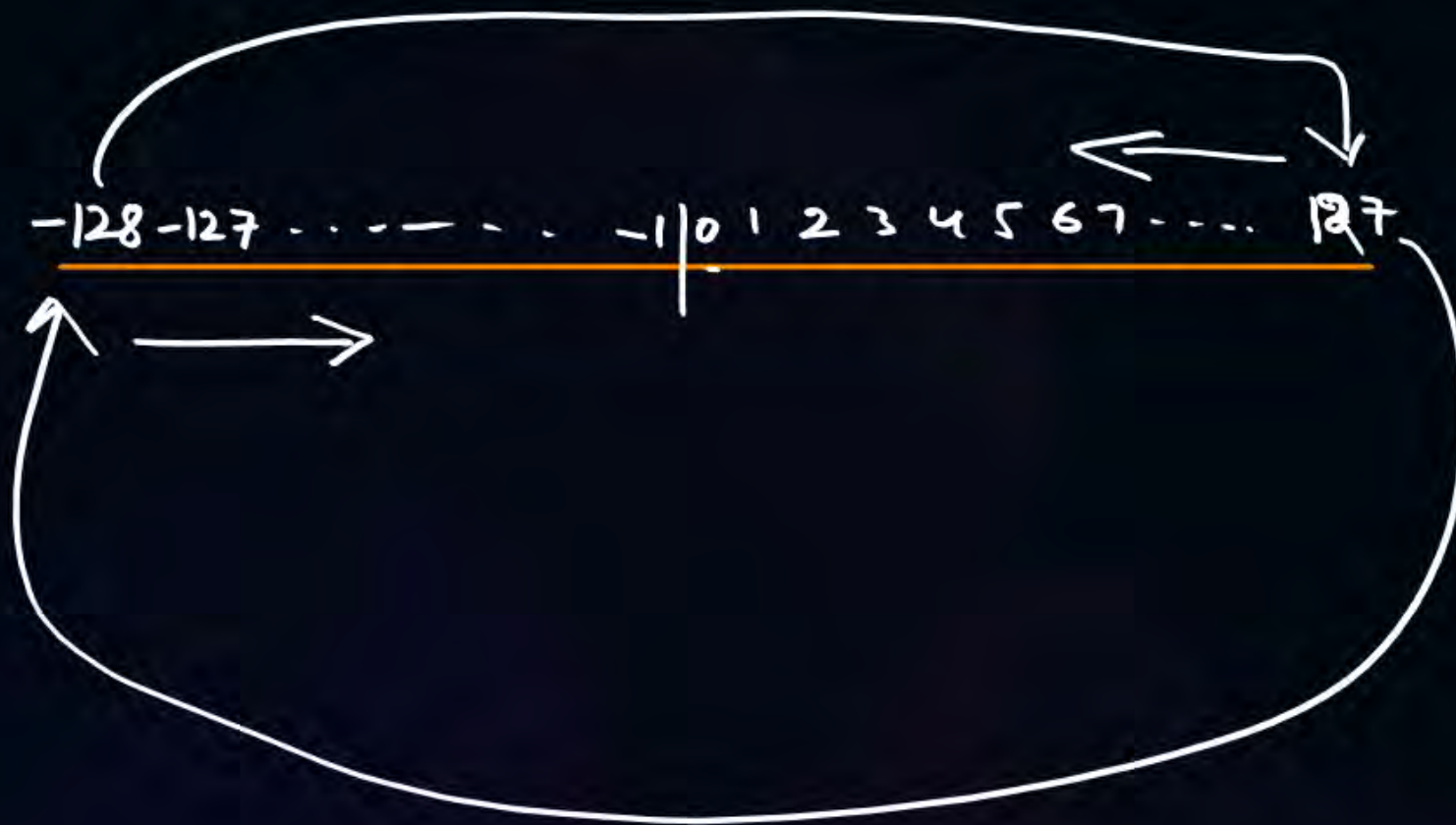


Char i = -135;

printf("%d", i);

o/p: 121

$$\begin{array}{r} 256 \\ - 135 \\ \hline + 121 \end{array}$$





Topic : I/O Functions - 1

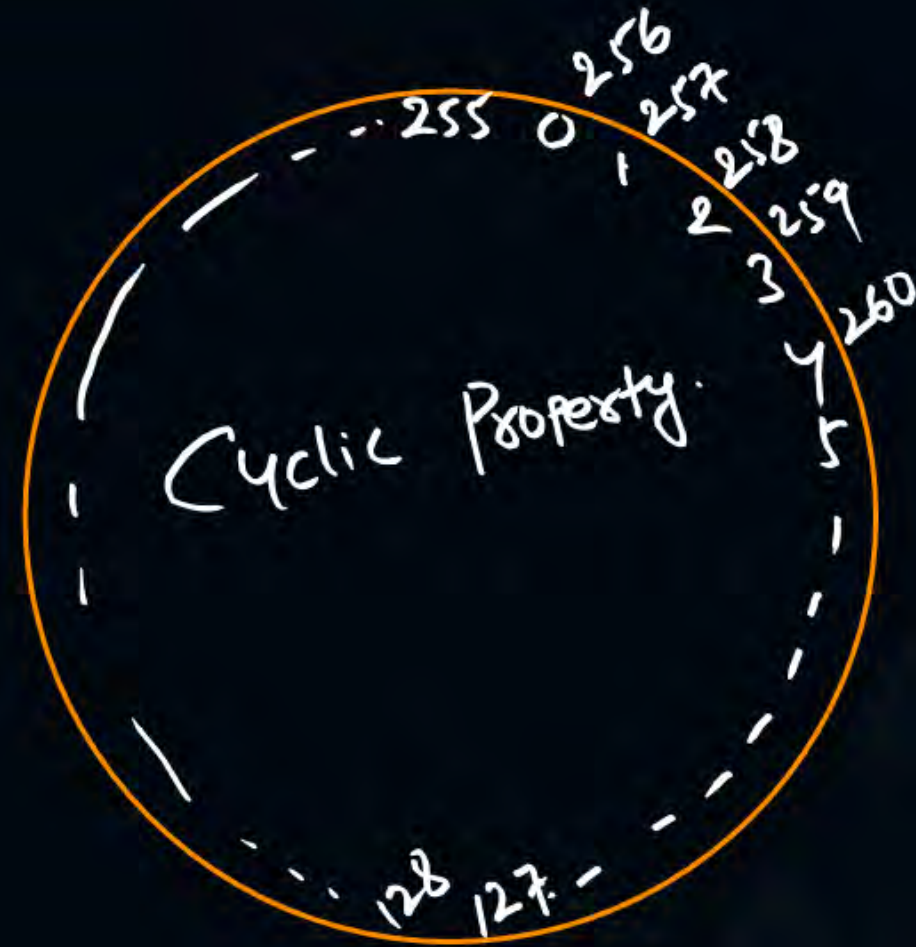


Unsigned char ch=260;

↳ Range: [0 to 255]

Printf("%d", ch);

o/p: 4





Topic : I/O Functions - 1



Let 1 integer size = 16 bits.

int i = -32790;

Signed int i = 32770;

printf("%d", i);

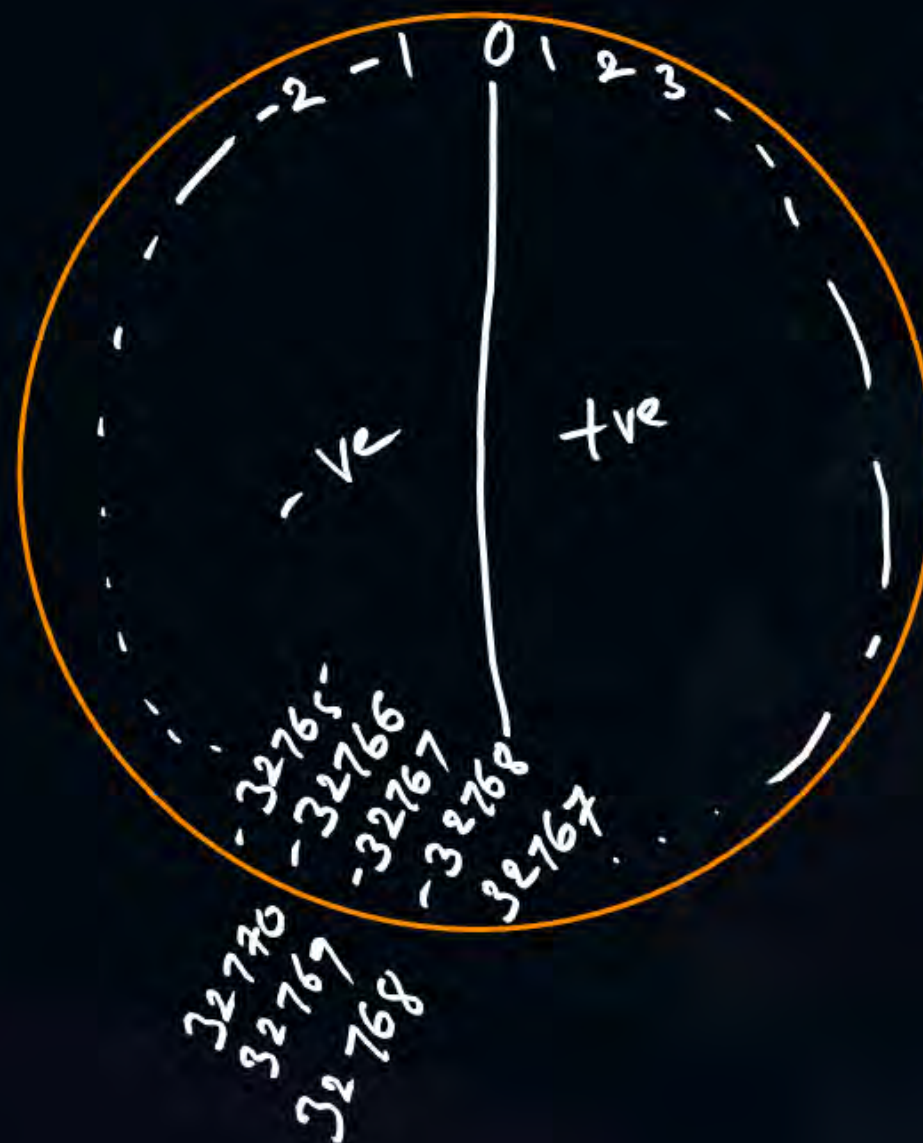
→ -2^{15} to $(2^{15} - 1)$

= -32768 to 32767

Total values = 65536

$$\begin{array}{r} - 32770 \\ \hline - 32766 \\ \hline \end{array}$$

$$\begin{array}{r} 65536 \\ 32790 \\ \hline + 32746 \\ \hline \end{array}$$





Input-Output Functions : The stmts used for accepting input values from user and Produce Output results to User.

Forms of Input

1. Text (Number, Symbol, letter)

2. Control Input (Enter key, Functional Keys, Ctrl, Shift ...)

3. Hard Copy

4. Image

5. Voice (audio)

6. Thumb impression | Touch

Forms of output

1. Text

2. Hard Copy

3. Audio

4. Video



Input/Output Functions

1) Console i/o functions \Rightarrow Input \leftarrow Keyboard, Output \rightarrow Monitor/Display device

2) Disk (or) File i/o functions \Rightarrow Input \leftarrow Memory (Files), Output \rightarrow Memory (Files)

Console i/o functions : 2 types

a) Formatted i/o : scanf(), printf()

b) UnFormatted i/o : getch(), getche(), getchar(), gets()
putchar(), puts()

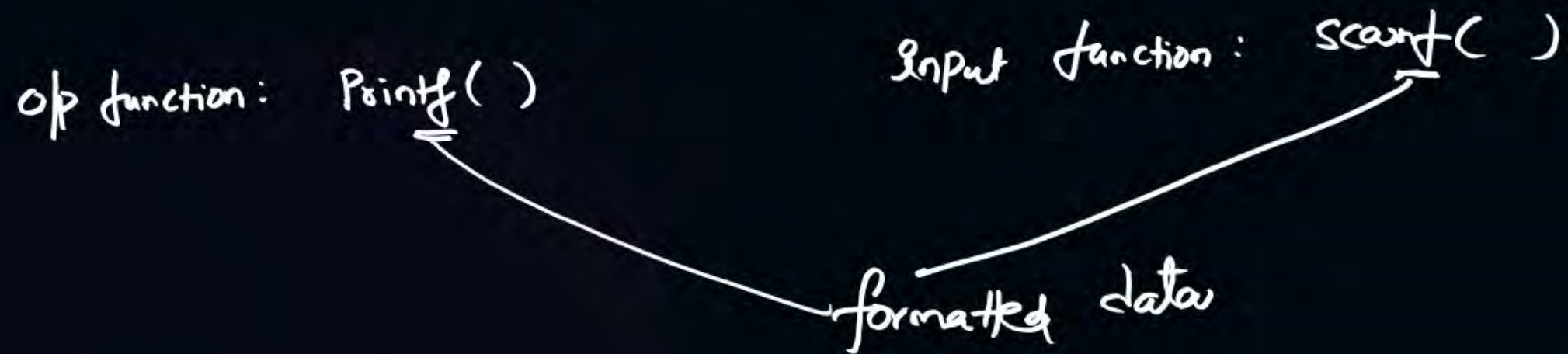


Topic : I/O Functions - 1



Formatted i/o functions

- Input accepted as required format
- Output displayed as required format.



Printf() function

Syntax:

unsigned int

Return type
[output type]

Printf(char *ptr);

string (input accepted to Print)

int i;

i = Printf("GATE");

i value = 4

o/p screen/console

G A T E

Printf() function will process characters to the o/p console and returns, No. of characters processed.

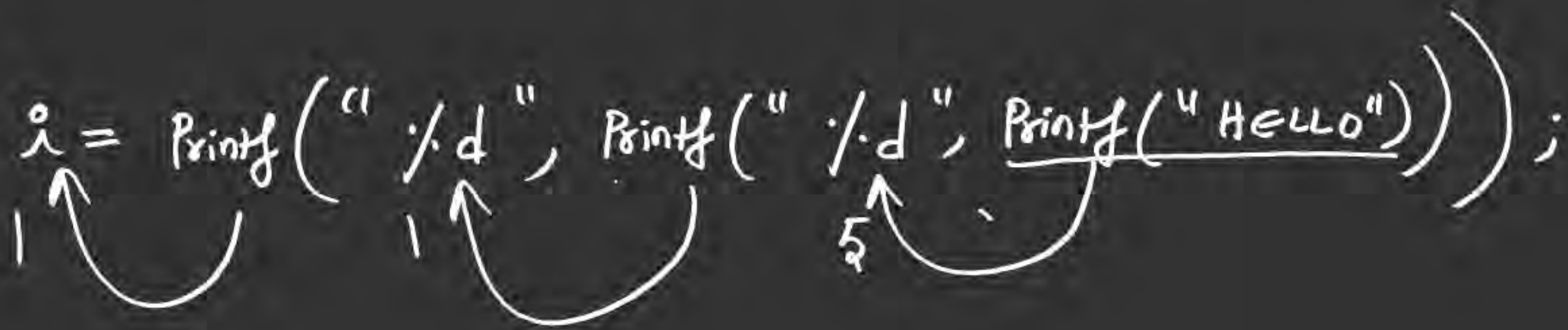
$i = \text{Printf}(\text{"HELLO"}) + \text{Printf}(\text{"HAI"}) * \text{Printf}(\text{"BYE!"});$

$\underbrace{\hspace{1.5cm}}_5 + \underbrace{\hspace{2.5cm}}_{3 * 4}$
 $i \text{ value} = \underline{\hspace{2cm}}$ o/p. H A I B Y E ! H E L L O

$$i = 5 + 3 * 4$$

$$\boxed{i = 17}$$

$i = \text{Printf}(" \%d", \text{Printf}(" \%d", \text{Printf}(\text{"HELLO"})));$



o/p: HELLO 5 1

$i =$ 1



2 mins Summary



- Cyclic Property
- I/O statements classification
- Console i/o
 - ↳ Formatted i/o
 - ↳ scanf(), printf()



THANK - YOU