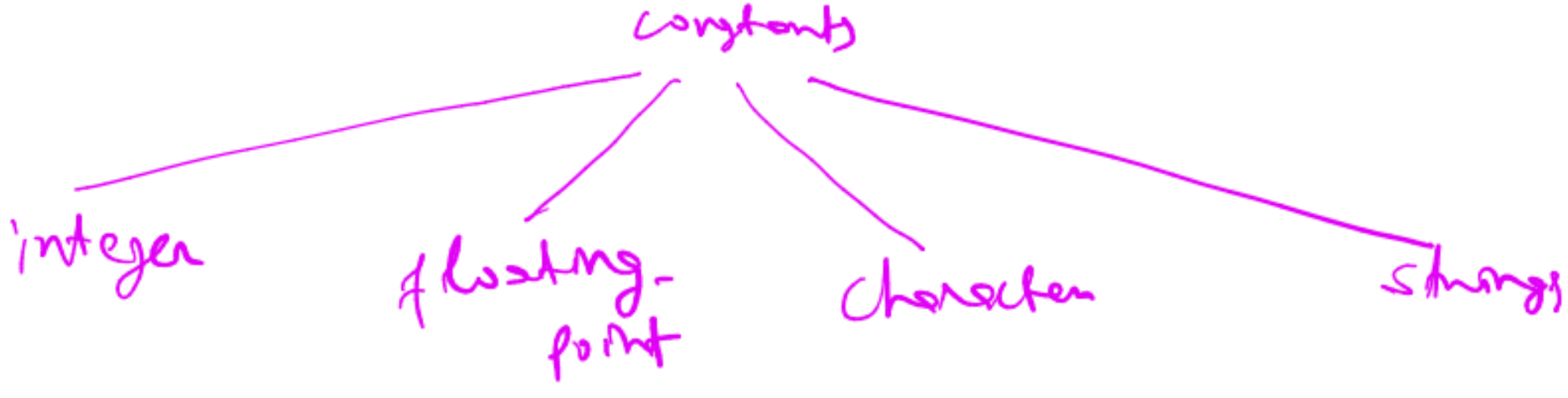
Primary data types

- Character
  - char
  - Signed char
  - Unsigned char
- Integer
  - Signed
    - int
    - short int
    - long int
  - Unsigned
    - int
    - short int
    - long int
- Float
  - float
  - double
  - long double
- Void

Constants



Numeric constants

- Commas and blank spaces are not allowed.
- (-) sign is allowed in the beginning only.
- Within specific max and min bound of the data type.

Integer constants

Decimal	Octal	Hexadecimal	Binary
0	01	0x1	0b0
345	0376	0x7893	0b10110
-345	0777	0xAB92	0B111
3475		0xabce1	
Invalid: 12,245	X 743	X 0x12,34	X 06211
Invalid: 36.0	X 09762	X 0BE231	X 061,11
Invalid: 10 20 30	X 07,777	X 0x.4BF1	X 031.11
Invalid: 12-45		X 0xBF-38	
Invalid: 12-45			
0120			

Unsigned and long integer constants

43567U – decimal (Unsigned)

2345678L – decimal (long)

71234567UL – decimal (Unsigned long)

0123456 7L – octal (long)

077777U – octal (Unsigned).

Floating-point constants

10.0 0.3 986.23 0.075234

2E-8 → 2 × 10^-8

0.062E-3 → 0.062 × 10^-3

1.2345ff8 → 1.2345 × 10^+8

Invalid

1,012.0

2E+12.9 → Integer

5 × 10^3 → 5E+3, 5E3, 5.0E3, 0.5E4, 50E2

0.375

0.9 ⟶ 0.900001 ←
0. 899999 ←

0.7
× 2
1.4
× 2
0.8
× 2
1.6
× 2
1.2
× 2
0.4

0.9
× 2
1.8
× 2
1.6
× 2
1.2
× 2
0.4
× 2
0.8

a: 0.9
0.900001

0.9 ⟶ 0.899999

0.9 == 0.9

Fake!

0.7

0.5

0.5
× 2
1.0

Character Constants

Single character in apostrophes

'B' 'x' '3' '0' '?'

2^7 128

ASCII - American Standard Code for Information Interchange

[7 bits]

IBM Mainframe : EBCDIC

Extended Binary Coded Decimal Information Code

[8 bits]

A - 65

Z - 90

a = 97

z = 122

0 - 48

9 - 57

5 - 53

NULL - 0

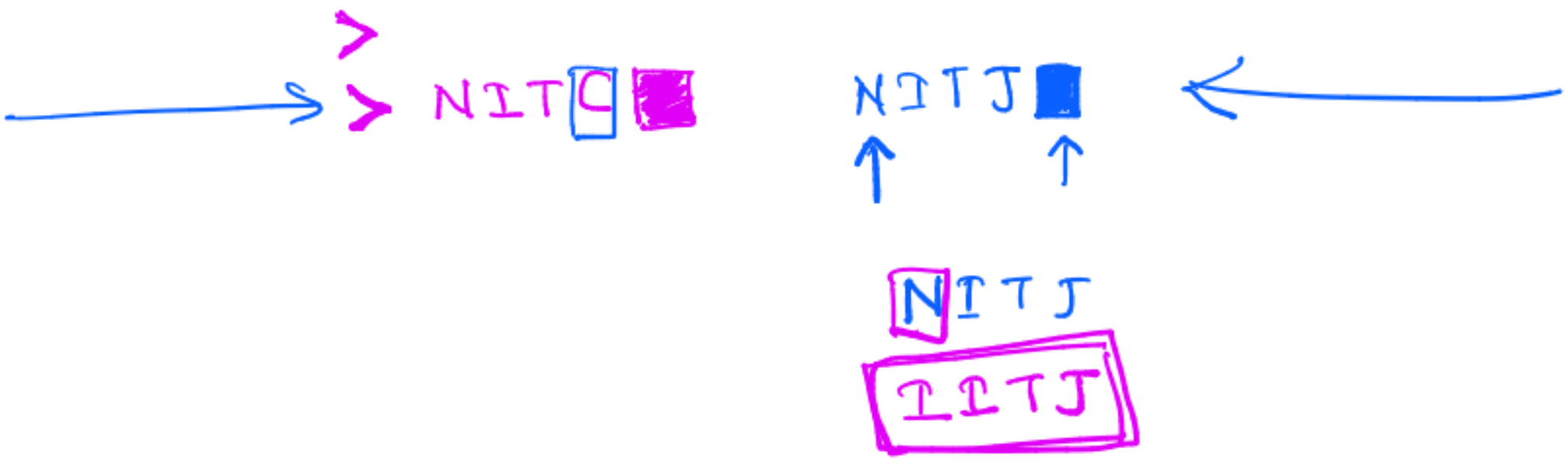
A - Z

65 - 90

Escape sequences

\a	bell	007
\\	backslash	092
\0	NULL	000
\b	backspace	
\r	carriage return	013

printf ("\n NIT C \b J \r I I");



D → $(68)_{10}$ → $(44)_{16}$ → $(104)_{8}$

ASCII

① Hexadecimal

② Octal

\x44

\104

8 | 68

8 | 8 — 4

8 | 1 — 0

0 — 1

printf("I want to print \x44");

I want to print D

Printf("\104");

D

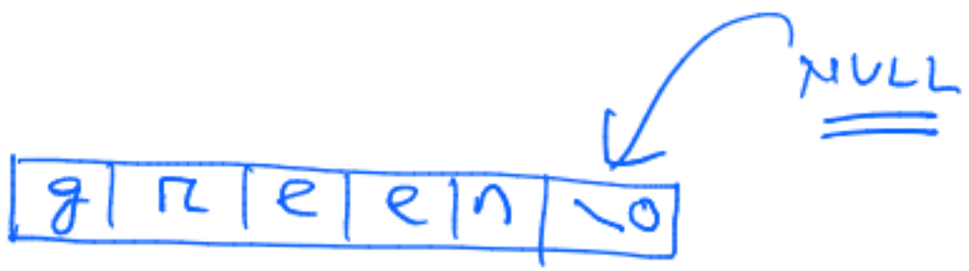
String constants

"green" "Red" "NIT JALANDHAR" "10-04-2022"

"2*1+(4*3)+6"

"LINE1\nLINE2\nLINE3"

LINE1
LINE2
LINE3



The last character of a string constant is '\0'.

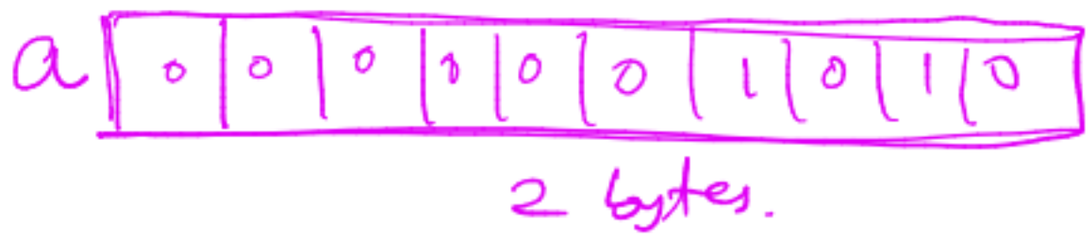
Variable

It is an identifier which is used to represent a single data item.

```
int a, b, c;
    ↑ ↑ ↑
```

```
int a;
int b;
int c;
```

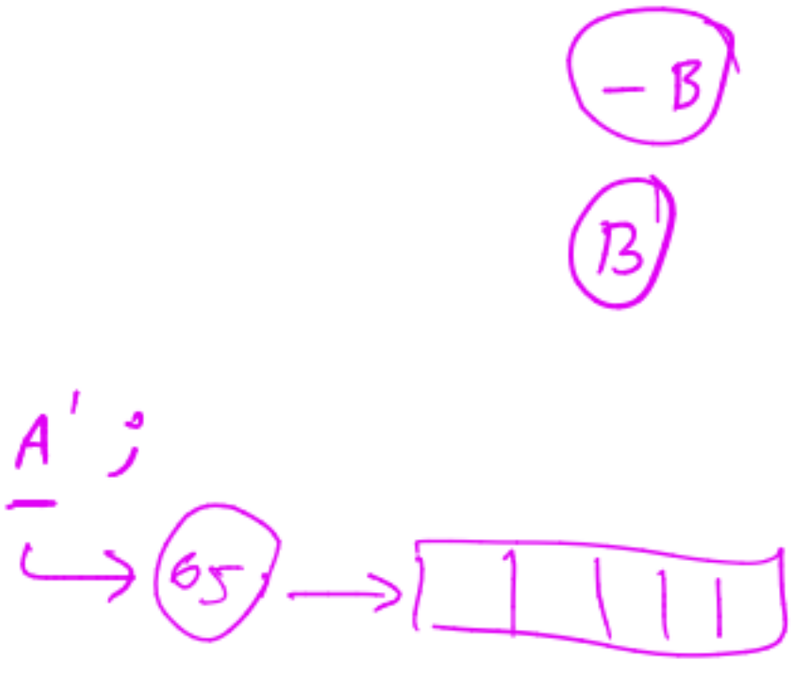
```
char item;
float item;
```



Initialization

```
int a=10;
int a=10, s=0;
```

```
char item='A';
```



Expressions

Represents a (single data item) — char, Number.

a+b x-y d : e*f

a<=b

True – 1

False – 0

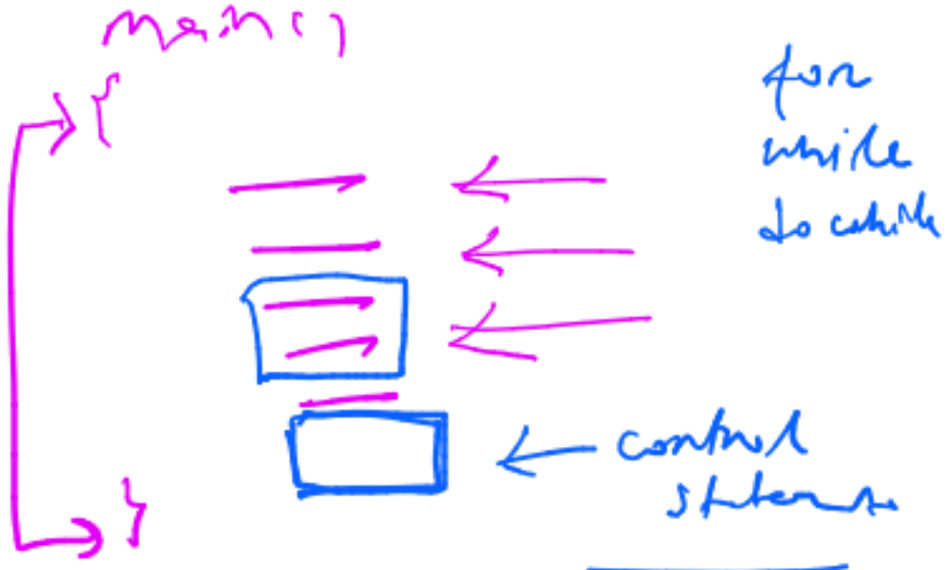
a==b

True – 1

False – 0

Statements

- Expression Statements
- Compound statements
- control Statement



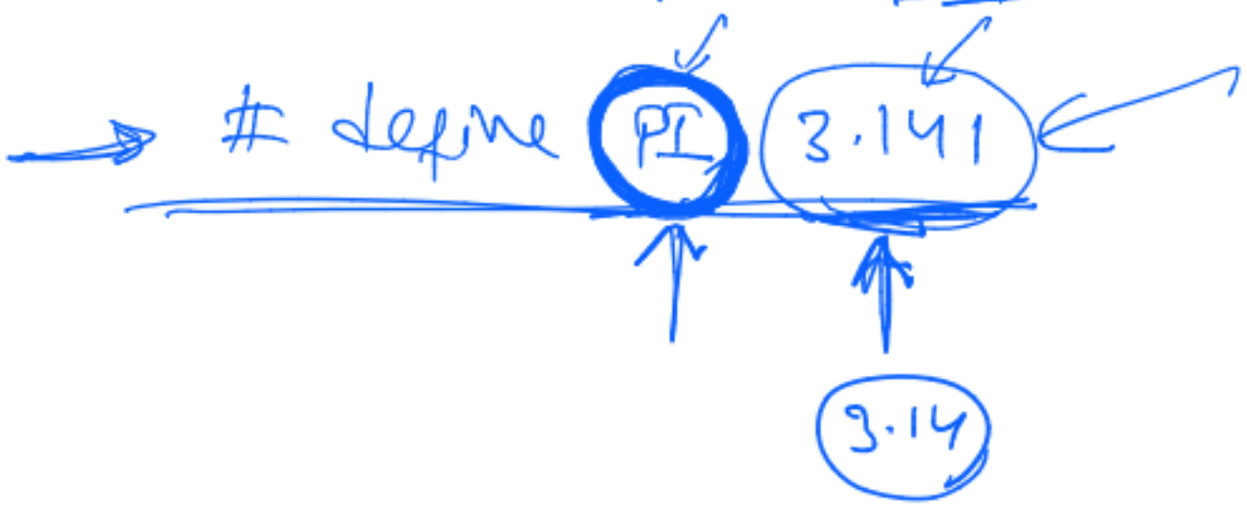
→ if else

→ switch case

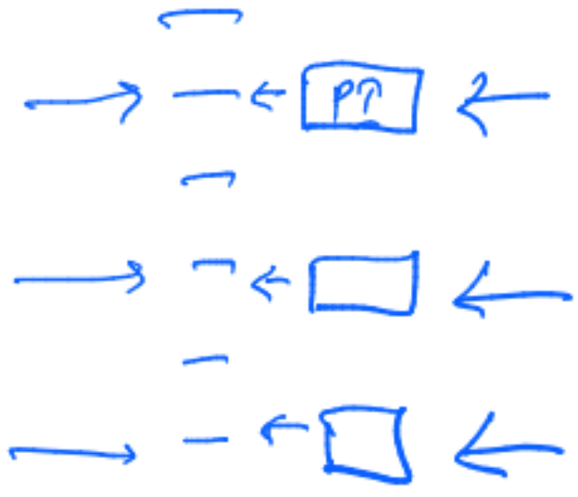
Every statement in C ends with a semicolon.

Symbolic constant

define name <text>



main()
{



$\frac{2\pi r}{2r}$

}

$2\pi r$

$2 * PI * r$