PW SKILLS

Datatypes :-

```
int data = 10;
 ↓    ↓     ↓
TypeData  var   Value / literal / info / data
          name
```

---

age = 18 ;

=> Numeric
  └> whole Number => 45, 55, 123 etc
  └> Real Number => 45.5, 59.9

=> Character
  └> char

=> logical Data / true - false -> boolean

=> To manage whole number type Data =>

=> byte, short, int, long

1 Byte => 8 bit

byte a = 45 ;

  └> 1 Byte

n -> no. of bits

-2^{n-1} to $2^{n-1}-1$

-2^{8-1} to $2^{8-1}-1$

-2^{7} to $2^{7}-1$

-128 to 127

byte age = 18 ;

byte data = 128 ; X CE

short a = 125; 2 Bytes => 16 bits

2 Bytes 

-2^{n-1} to $2^{n-1}-1$

-2^{16-1} to $2^{16-1}-1$

-2^{15} to $2^{15}-1$

-32768 to 32767

8086 - processor

int data = 125;
int

int => widely used 4 x 8 => 32

↳ 4 bytes 

-2^{32-1} to $2^{32-1}-1$

-2^{31} to $2^{31}-1$

-2147485648 ....

int age = 45;

long => 8 bytes 8 x 8 => 64 bits

-2^{64-1} to $2^{64-1}-1$

-2^{63} to $-2^{63}-1$

long data = 4555 l; L/l

=> byte, short, int, long ;

Real Number 10.5 45.5

↳ float, double

float data = 45.5f;

float → 4 bytes (↓ 32 bits) double → 8 bytes (64 bits)

float info = 45.5f; (↓ 4 byte)

double info = 45.5; (↓ 8 bytes)

logical | true | false → boolean

boolean data = true ; false

boolean data = false ; 'a' 10 X

⇒ Character
↳ char

{ 0010010 }

int → 45 specific format → base 2

float, double → ~~Iett~~

char →

A → 0
B → 1
2^1 → 1 bit

A 00
B 01
C 10
D 11
2^2 → 2 bits

A 000
B 001
C 010
D 100
E
F 101
G 110
H 111
2^3 → 3 bit

128 → 2^7 ASCII

Dec	Binary rep
0	0000 0000 → 1 Byte
1	0000 0001
2	
3	
@	
#	
A	65
!	
3	
a	97
3	1

character → ASCII → 8 bits → 1 Byte

C → char → 1 Byte

UTF → 65536 → 2^{16} → 16 bits → 2 Bytes

UTF-16

128 Dec
A 65

⇒ char data = 'a' ; 2 Bytes

a 97

→ Java → UTF → 2 Bytes

char a = 'A';

'A' 'b' X

~~'Ab'~~

char data = 'a' ;

byte, short, int, long

float, double

boolean

char