C, C++ and DSA in depth

Data Types and Variable Declarations

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Agenda

1. Why classificatin of data?
2. Data Types
3. variable declaratims
4. ASCII
5. float vs double

Data Classification

- Different data requires different way of handling data in computer.

Factor responsible for data classification

- Memory size required to store data
- Method to convert data into binary for internal representation.
- Kind of operations performed on data.

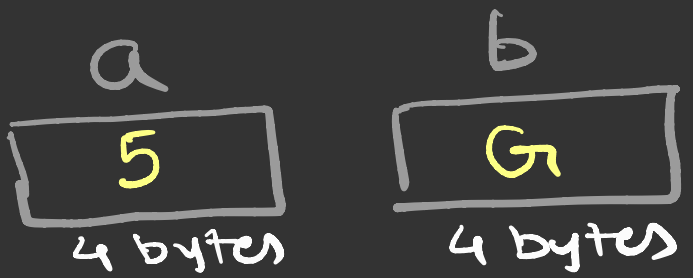
Data Types

char
int
float
double
void

1 byte = 8 bits

Variable Declaration

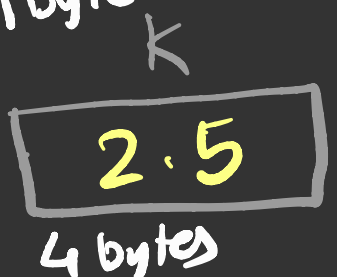
Integer — 4 bytes — `int a=5, b;`



Character — 1 byte — `char m='A';`

Real

- 4 bytes — `float K=2.5;`
- 8 bytes — `double d1;`



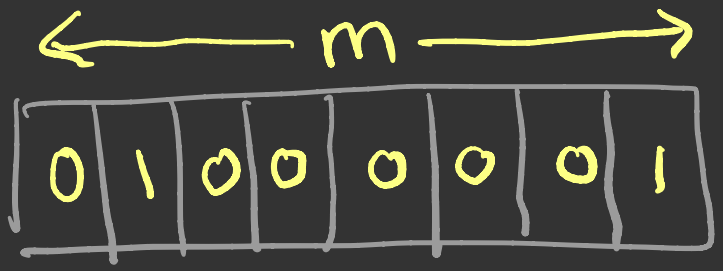
4 + 4 + 1 + 4 + 8 = 21

ASCII

character encoding

American Standard Code for Information Interchange

```
char m='A';
```




```
char m=65;
```

```
int a=65;
```


```
int a='A';
```

		0
		1
		2
' '	—	32
'0'	—	48
'@'	—	64
'A'	—	65
'B'	—	66
'Z'	—	90
'a'	—	97
'z'	—	122

255 → !!!!!!!!

float vs double

4 bytes | 8 bytes

0.7

$0.7 = 0.1011001100110011001100\ldots$

$0.7 \times 2 = 1.4 \quad 1$

→ $0.4 \times 2 = 0.8 \quad 0$

$0.8 \times 2 = 1.6 \quad 1$

$0.6 \times 2 = 1.2 \quad 1$

$0.2 \times 2 = 0.4 \quad 0$

→ $0.4 \times 2 = 0.8 \quad 0$

$0.8 \times 2 = 1.6 \quad 1$

$0.6 \times 2 = 1.2 \quad 1$

$0.2 \times 2 = 0.4 \quad 0$

→ $0.4 \times 2 = 0.8 \quad 0$

0.1011

0.10110011

0.10110011