

GSET - Programming with Mr. Hill

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Module 2 - Variables and Assignment

Module 2 - Variables and Assignment

- Types of Numbers
- Variables and Type
- Assignment and Memory
- *A Riddle*
- A C++ Example

Types of Numbers

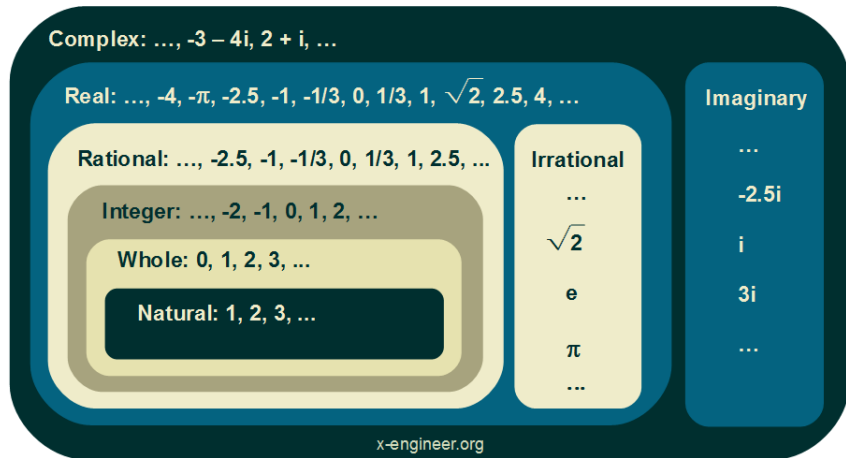


Image: x-engineer.org

Types of Numbers

| Binary | Decimal | Hexadecimal |
|--------|---------|-------------|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 10 | 2 | 2 |
| 11 | 3 | 3 |
| 100 | 4 | 4 |
| | 5 | 5 |
| | 6 | 6 |
| | 7 | 7 |
| | 8 | 8 |
| | 9 | 9 |
| | 10 | A |
| | 11 | B |

| Binary | Decimal | Hexadecimal |
|--------|---------|-------------|
| | 12 | C |
| | 13 | D |
| | 14 | E |
| | 15 | F |
| | 16 | |
| | 17 | |
| | 18 | |
| | 19 | |
| | 20 | |
| | 21 | |
| | 22 | |
| | 23 | |

some reference

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| | | |
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some reference

Variables and Type

```
int val_A;
```

```
int val_B = 25;
```

A variable is a storage container.

- In C++ and many other programming languages, each variable has a type defined by the programmer. This is called **Initialization**.
- In some programming languages, the type is hidden or abstracted away from the programmer.

Variables and Type

Commonly Used Types in C++ and other languages

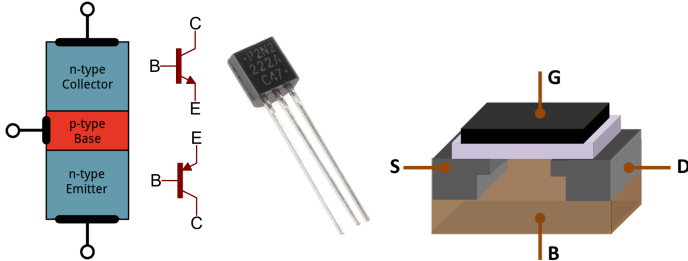
| Type | C++ Syntax | Purpose | Examples |
|----------------|------------|-------------------------|---------------|
| Boolean | bool | state, logic | 1,0 (On,Off) |
| Integer | int | arithmetic, counting | 1,2,56,-123 |
| Floating Point | float | arithmetic, computation | 57,412.683 |
| Double Float. | double | increased resolution | 124.000234567 |
| Character | char | human language | "Hello World" |

Variables and Type

Variable type have limited range.

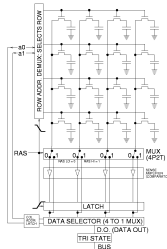
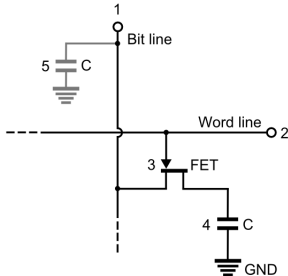
| Type | C++ Syntax | Min Value | Max Value |
|-------------------------------|------------|-----------|-----------|
| Boolean | bool | 0 (Off) | 1 (On) |
| Unsigned Integer (4 bytes) | uint | 0 | |
| Signed Integer (4 bytes) | int | | |
| Unsigned Short Int. (2 bytes) | uint | | |
| Signed Short Int. (2 bytes) | int | | |
| Floating Point (4 bytes) | float | | |
| Double Float. (8 Bytes) | double | | |
| Character | char | | |

Assignment and Memory



[Sparkfun - Transistor](#)
[Wikipedia - Transistor](#)

Assignment and Memory



Wikipedia - Memory Cell

Wikipedia - Semiconductor Memory Wikipedia - RAM

Assignment and Memory

The Assignment Operator

```
val_A = 53214;
```

```
val_B = 0;
```

- In C++ and many other programming languages, variables are assigned a value using the equals sign. This is called **assignment**.
- Typically the value in the variable can be changed, or re-assigned.

A Riddle

Question:

What is the maximum number of rupees that you can hold in the original *Legend of Zelda* video game?

Answer:

A C++ Example

```
// Variables and Assignment - C++ - June 7, 2021

#include <iostream>

int main()
{
    int val = 56 ;

    std::cout<<"The value is: "<<val;

    return 0;
}
```
