GSET - Programming with Mr. Hill

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Module 2 - Variables, Expressions, and Assignment

Module 2 - Variables, Expressions, and Assignment

- Types of Numbers

- Variables and Type

- Assignment and Memory
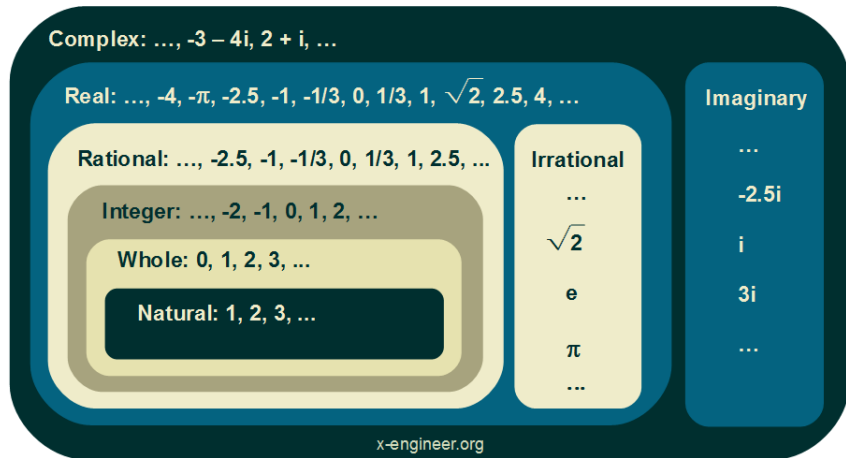
- A *Riddle*

- 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

Types of Numbers

Binary	Decimal	Hex.
0	0	0
1	1	1
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Binary	Decimal	Hex.
0	0	0
1	1	1
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100	4	4

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

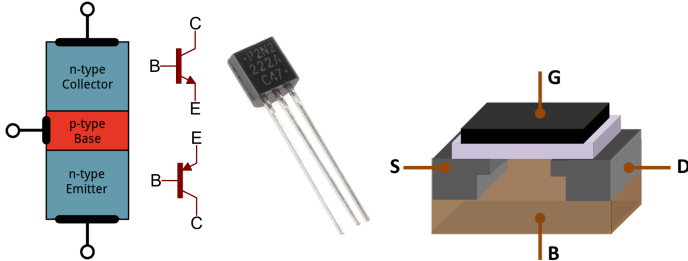Commonly Used Types in C++ and other languages

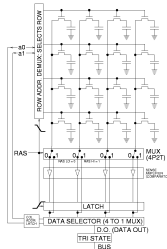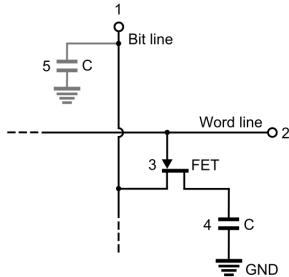| Type	C++ Syntax	Purpose	Examples
Boolean	bool	state, logic	1,0 (On,Off)
Integer	int	arithmetic, counting	1,2,56,-123
Floating Point	float	arithmetic, computation	57,412.683
Double Float.	double	increased resolution	124.000234567
Character	char	human language	"Hello World"

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

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

```cpp
// Variables and Assigment - C++ - June 7, 2021

#include <iostream>

int main()
{
   int val = 56 ;

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

   return 0;
}
```