Section 27 : Miscellaneous #2

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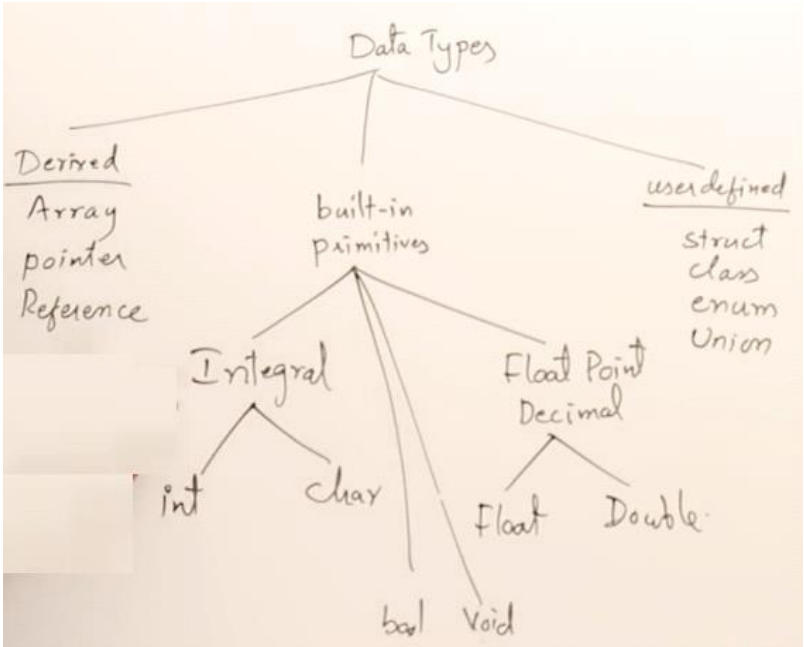
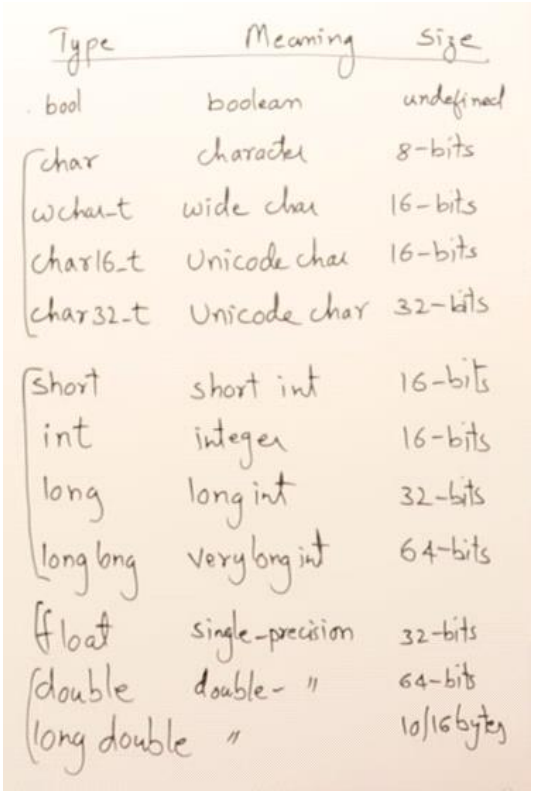
Section 27 : Miscellaneous #2

Data Types : There are 3 types of data type :

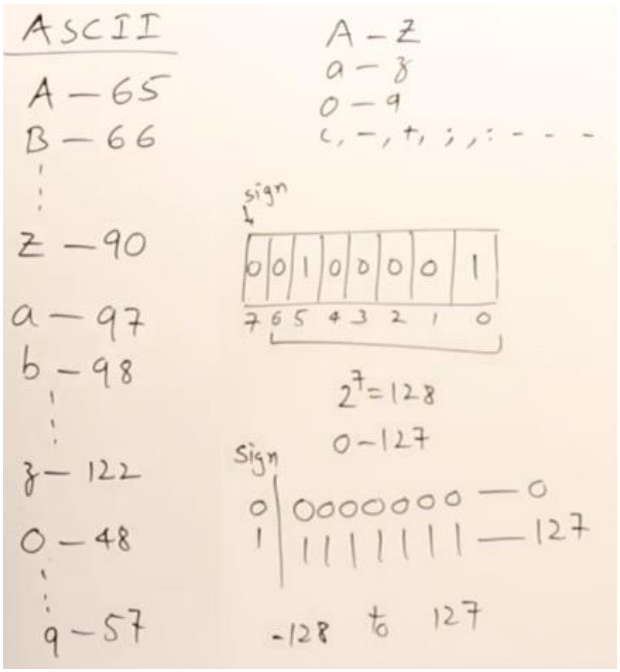
- Built-in/primitive
  - Integral
    - Int
    - Char
  - Float Point Decimal
    - Float
    - Double
  - Bool
  - void
- Derived
  - Array
  - Pointer
  - Reference
- User defined
  - Struct
  - Class
  - Enum
  - Union



Data Type, Meaning and Size :

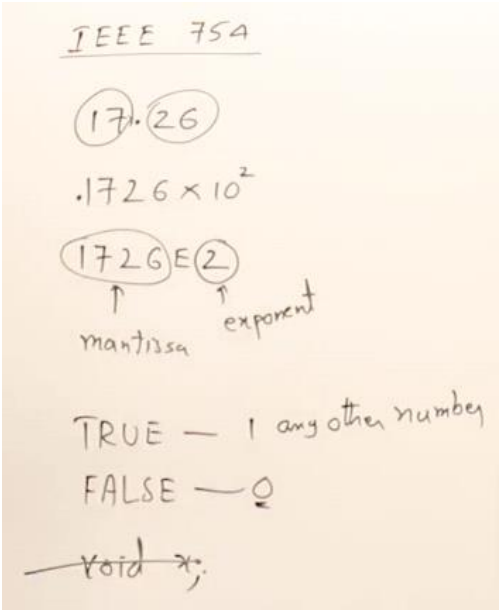


ASCII :



- Those are called as unicorns to support those natural languages.
- www.unicode.org - code for various national languages.
- This Unicode may not be supported on every C++ compiler, but the data type is available.

- **The size of an Integer** depends on the word size of a machine, word size means how many bits capacity a machine is having. So based on this, these integer types will be dependent.
- Float always takes 4 bytes only.
- Char always take 1 byte.
- Void data type is there but we can't declare a variable of type of Void, Void means nothing. But we can declare a pointer of type void.
    - Void *ptr;

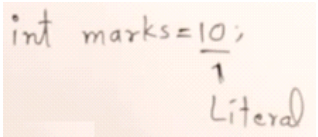


Data Type Size :

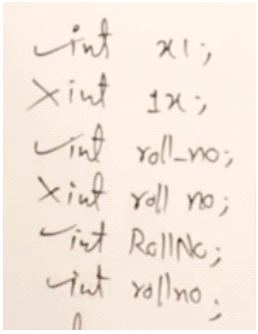
```
char c;
cout<<sizeof(c)<<endl;  // 1
cout<<CHAR_MIN<<" "<<CHAR_MAX<<endl; // -127 -> 128

unsigned char uc;
cout<<sizeof(uc)<<endl;  // 1
cout<<UCHAR_MAX<<endl; // 0 -> 255
// UCHAR_MIN not available but it's 0

int i;
cout<<sizeof(i)<<endl;  // 4
cout<<INT_MIN<<" "<<INT_MAX<<endl;
// -2147483648 -> 2147483647

float f;
cout<<sizeof(f)<<endl;  // 4

long l;
cout<<sizeof(l)<<endl;  // 4

double d;
cout<<sizeof(d)<<endl;  // 8

long double ld;
cout<<sizeof(ld)<<endl; // 16
```

Variables and Literals :

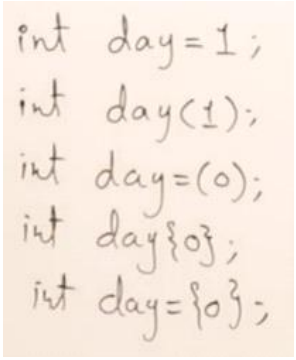
- During the time of the program, program will store the data and variables.
- Variables are also called as identifiers and are the name given by a programmer.
- Variable must be declared before it is used. So when we declare a variable, it will occupy some memory.
- Int marks // variable
- Int marks = 100 // 100 is literal
    - This direct value that is assigned to a variable is called Literal.



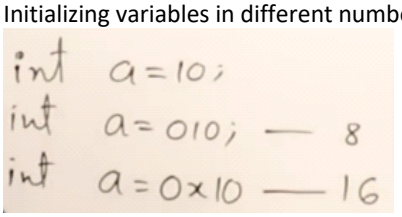
- Valid and invalid declaration of variables :



- These are the five methods by which we can assign a value :

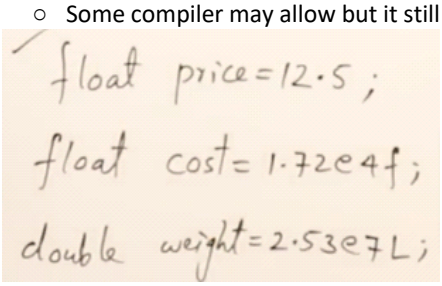


- Initializing variables in different number systems :



  - Prefix with zero means, it's octal number system.
  - Prefix with zero x means, it's octal number system.

- Int day = 1.7;
  - Some compilers may give error here or some compiler will truncate and remove point seven and assign one to that variable day.
  - So depends on the compiler. So it's better avoid it.
- Long distance = 65839L;
  - With L in the end of number, this will be a long value (long data type).
- Float price = 12.5;
  - By default this value is double.
  - Float price = 12.5f, this is float literal.
  - Some compiler may allow but it still double literal.



- Char section = 'A'';
  - Char section = 65; // using A ascii value, its same.
- Char section = "A";
  - This will be a string as we are using double quotes "".
- Bool b = true;, bool b = TRUE;, bool b = 1.
  - Depend on compiler, capital or small, or we can assign 1 also.
- String : Not a primitive data type, but a class provided by C++.
  - We can create variables which is called as objects.
  - String name = "John";
    - String literal should be in double quotes "".
- When we declare the variables in the program, they will occupy the memory inside the **Stack** during the execution of the program.

- And the program is running inside the code section. Code section contains machine code of the program and then execute line by line.

- Char a = 65.5;
    - When a float values got converted itto character and it is done implicitly, then it's called **Coercion**.
- Float a = 123e2; // it's 123 * 10^2 = 12300
- Float a = 123e-2; // it's 123 * 10^-2 = 1.23

Constructor in Inheritance :

- Whenever we are doing inheritance of classes, and creating an object of derived class. Then we should be aware that the parent class constructor will be executed first, then child class constructor will be executed.
- In below special constructor, from the derived class constructor, we are calling the Parameterize constructor of base class. (Can explain using table top (wooden) and height)