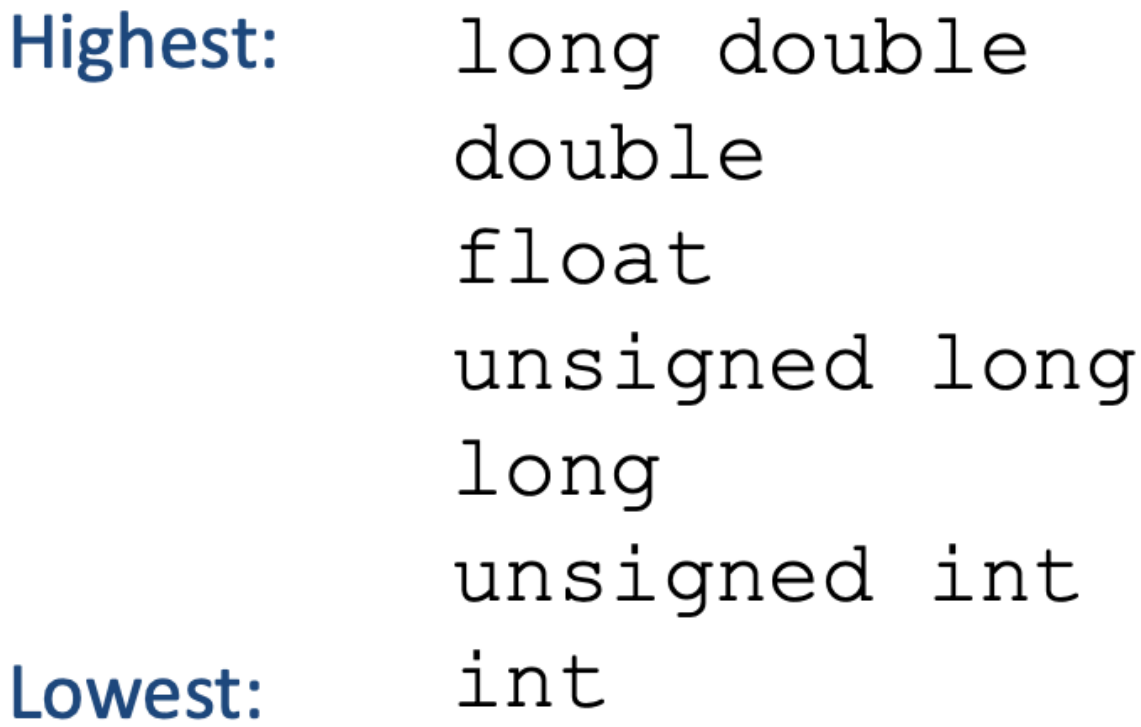
- Data Types




| Type | Size (bits | Range |
|---|---|---|
| unsigned char | 8 | 0 <= X <= 255 |
| char | 8 | -128 <= X <= 127 |
| short int | 16 | -32,768 <= X <= 32,767 |
| unsigned short int | 16 | 0 <= X <= 65,535 |
| long | 32 | -2,147,483,648 <= X <= 2,147,483,647 |
| unsigned long | 32 | 0 <= X <= 4,294,967,295 |
| enum | 32 | -2,147,483,648 <= X <= 2,147,483,647 |
| int (short,long) | 32 | -2,147,483,648 <= X <= 2,147,483,647 |
| float (6 digits) | 32 | 1.18 X 10^-38 < \|X\| < 3.40 X 10^38 |
| double (16 digits) | 64 | 2.23 X 10^-308 < \|X\| < 1.79 X 10^308 |
| long double (18 dig) | 80 | 3.37 X 10^-4932 < \|X\| < 1.18 X 10^4932 |

- `sizeof()` can be used to give the size of any variable or datatype
  - ex. `cout << sizeof(double);`
- Constants can be defined in two ways
  - `#define MAX 100`
  - `const int value = 100;`
    - Can not set the value to unknown or use char

- `val++ and ++val` has two completely different meanings,
  - `val++` increments then returns the value of the variable
  - `++val` returns the value of the variable then increments

```
int num, val = 12;

 cout << val++;   // displays 12,
                  // val is now 13;
 cout << ++val;   // sets val to 14,
                  // then displays it
 num = --val;     // sets val to 13,
                  // stores 13 in num
 num = val--;     // stores 13 in num,
                  // sets val to 12
```