

Type Casting

Casting type of variables

- Every variable has a type.
- Types can be converted from one to another.
- Type conversion is called Type Casting.
- There are five types of type casting:
 - Static_cast
 - reinterpret_cast
 - const_cast
 - dynamic_cast
 - C-style cast (unsafe)

static_cast

- Syntax: `static_cast<NewType>(variable)`
- Convert type of a variable at compile time
- **Rarely needed to be used explicitly**
- Can happen implicitly for some types, e.g. `float` can be cast to `int`
- Pointer to an object of a Derived class can be **upcast** to a pointer of a Base class
- Enum value can be cast to `int` or `float`
- Full specification is complex!

dynamic_cast

- Syntax: `dynamic_cast<Base*>(derived_ptr)`
- Used to convert a pointer to a variable of Derived type to a pointer of a Base type
- Conversion happens at runtime
- If `derived_ptr` cannot be converted to `Base*` returns a `nullptr`
- **GOOGLE-STYLE** Avoid using dynamic casting

reinterpret_cast

- Syntax:
`reinterpret_cast<NewType>(variable)`
- Reinterpret the bytes of a variable as another type
- We must know what we are doing!
- Mostly used when writing binary data

const_cast

- Syntax: `const_cast<NewType>(variable)`
- Used to “constify” objects
- Used to “de-constify” objects
- Not widely used