Find the flaw

```
if (deletePage(page) == E_OK)
    if (registry.deleteReference(page.name) == E_OK)
       if ( configKeys.deleteKey(
              page.name.makeKey()) == E_OK)
            logger.log("page deleted");
       else
            logger.log("configKey not deleted");
    else
       logger.log ("deleteReference … failed");
```

```
try {
    deletePage(page);
    registry.deleteReference(page.name);
    configKeys.deleteKey(
                    page.name.makeKey());
} catch (Exception e) {
    logger.log(e.getMessage()); }
```

Samurai Principle

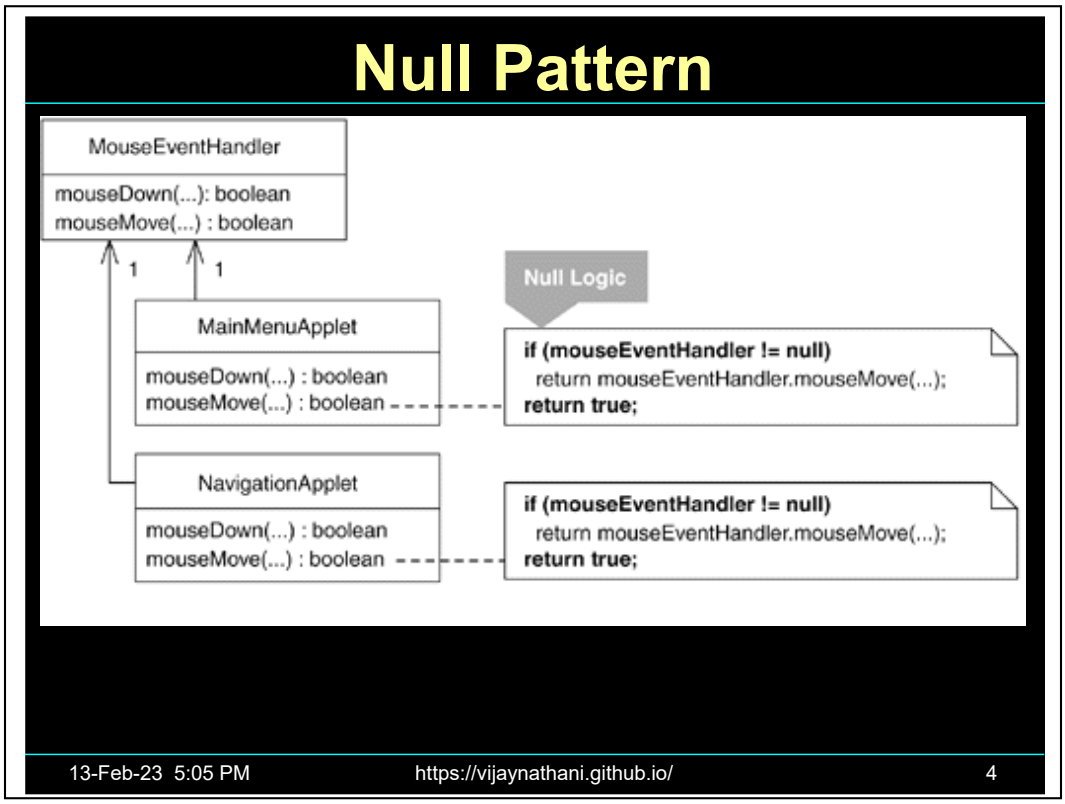
- Throw exception if any error occurs.

Compare

```
List<Employee> employees = getEmployees();
if (employees != null) {
    for (Employee e : employees)
        totalPay += e.getPay();
}
```

```
List<Employee> employees = getEmployees();
for( Employee e : employees)
    totalPay += e.getPay();
```


Java has Collections.emptyList() for this. It is immutable.



Null pattern

Avoid NullPointerException in code

Return “” instead of null for String class

Return an array with zero elements instead of null.

==========

Benefits and Liabilities

\+ Prevents null errors without duplicating null logic.

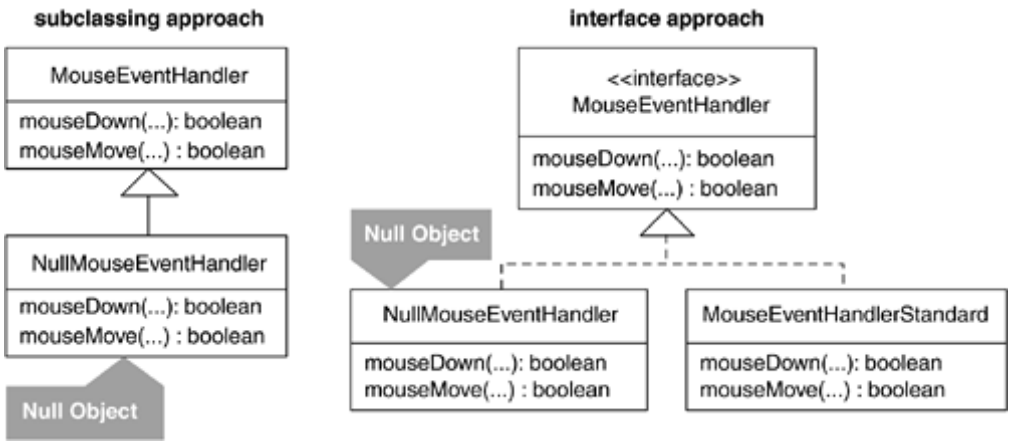
\+ Simplifies code by minimizing null tests.

– Complicates a design when a system needs few null tests.

– Can yield redundant null tests if programmers are unaware of a Null Object implementation.

– Complicates maintenance. Null Objects that have a superclass must override all newly inherited public methods.

Null Object by Interface



Guideline

- Unless a method declares in its documentation that null is accepted as a parameter or can be returned from a method as its result, then the method won't accept it or it will never return it.
- Return/Accept Optional object instead of null.

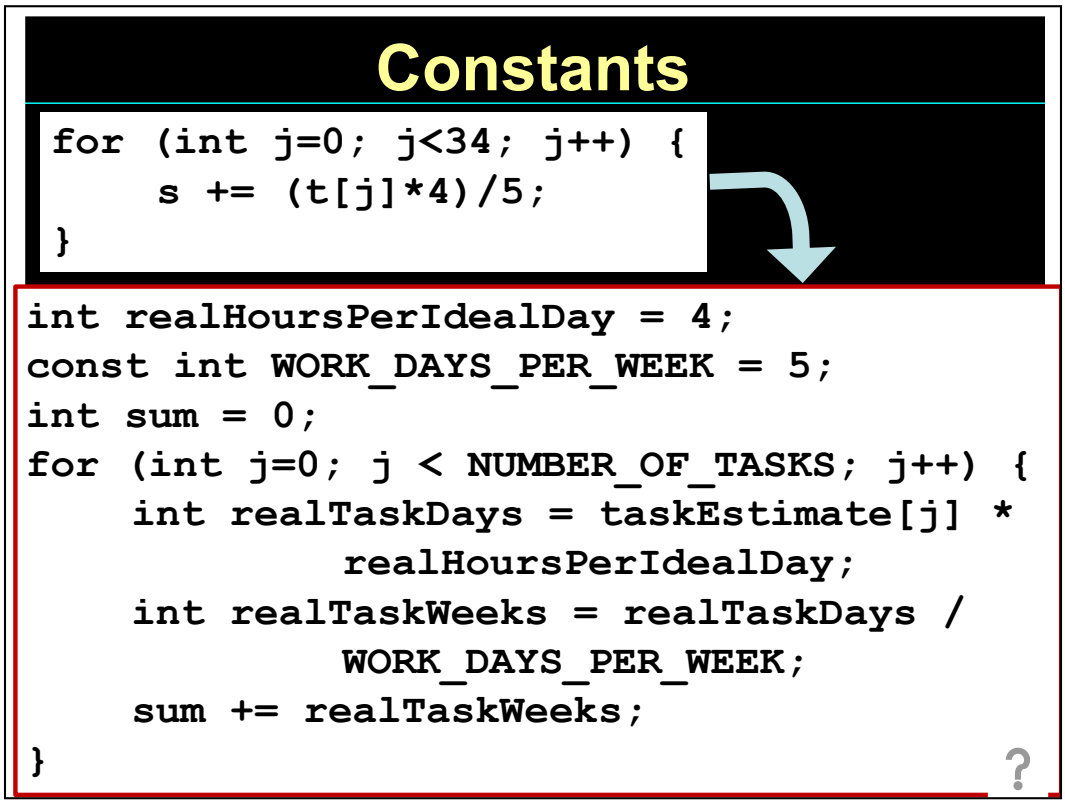
Q28Artists

Optional class is present in Java 8.

Optional is present in C++17, not in older versions.

Guidelines

- Prefer long to int and double to float to reduce errors.
- Avoid literal constants other than “”, null, 0 and 1.



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