

Review Questions and Exercises

10.25 How do smart pointers differ from regular pointers?

Smart pointers can automatically deallocate resources once they are out of the scope of use which prevents the problem of dangling pointers and memory leaks which is possible with regular pointers if not deleted.

10.26 Name the header file that needs to be included in a program that uses smart pointers.

#include <memory>

10.27 What happens when a `unique_ptr` that is managing an object is assigned the `nullptr` value?

The managed object is deallocated.

10.28 What does the `get()` method of the `unique_ptr` class do?

`get()` returns the raw pointer to the object managed by this smart pointer. This is useful if such a pointer needs to be passed to a function that does not know how to handle smart pointers.

10.30 List three different operations that are permitted on raw pointers but not on `unique_ptr` objects.

- 1. Arithmetic operations e.g. `uptr++`, `uptr--` is not valid**
- 2. Initialize value of another `unique_ptr` e.g. `unique_ptr<int> uptr2 = uptr1` is not valid**
- 3. Directly pass pointer to a function by value because pass by value means the argument's value is copied into the value of the corresponding function parameter**

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02/23/2020
Module 04 – HW 04
Ch 10 - Review Questions #25, 26, 27, 28, 30, Screenshots

Screenshots

```
D:\3 - CS 151 - Adv C++\hw04-unique-smart-pointers\hw4_pc1_pill_box.exe
Slot  attempts for Pill A: 0
Total attempts for Pill A: 1

Slot  attempts for Pill B: 6
Total attempts for Pill B: 1

Slot  attempts for Pill C: 2
Total attempts for Pill C: 1

Slot  attempts for Pill D: 9
Total attempts for Pill D: 1

Slot  attempts for Pill E: 2 0 3
Total attempts for Pill E: 3

Slot  attempts for Pill F: 1
Total attempts for Pill F: 1

Slot  attempts for Pill G: 2 7
Total attempts for Pill G: 2

Slot  attempts for Pill H: 0 3 2 1 1 2 4
Total attempts for Pill H: 7

Slot  attempts for Pill I: 7 7 7 6 6 0 0 5
Total attempts for Pill I: 8

Slot  attempts for Pill J: 3 4 0 2 0 9 4 6 4 8
Total attempts for Pill J: 10

Report (sorted by Slot)
  SLOT  PILL  ATTEMPTS
  ----  -
    0    A      1
    1    F      1
    2    C      1
    3    E      3
    4    H      7
    5    I      8
    6    B      1
    7    G      2
    8    J     10
    9    D      1
Total Attempts 35

Report (sorted by Pill)
  SLOT  PILL  ATTEMPTS
  ----  -
    0    A      1
    6    B      1
    2    C      1
    9    D      1
    3    E      3
    1    F      1
    7    G      2
    4    H      7
    5    I      8
    8    J     10

-----
Process exited after 0.09766 seconds with return value 0
Press any key to continue . . .
```

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```
D:\3 - CS 151 - Adv C++\hw04-unique-smart-pointers\hw4_pc1_pill_box.exe
Slot attempts for Pill A: 2
Total attempts for Pill A: 1

Slot attempts for Pill B: 4
Total attempts for Pill B: 1

Slot attempts for Pill C: 2 9
Total attempts for Pill C: 2

Slot attempts for Pill D: 7
Total attempts for Pill D: 1

Slot attempts for Pill E: 1
Total attempts for Pill E: 1

Slot attempts for Pill F: 5
Total attempts for Pill F: 1

Slot attempts for Pill G: 8
Total attempts for Pill G: 1

Slot attempts for Pill H: 4 7 3
Total attempts for Pill H: 3

Slot attempts for Pill I: 6
Total attempts for Pill I: 1

Slot attempts for Pill J: 4 3 1 2 4 1 2 6 0
Total attempts for Pill J: 9

Report (sorted by Slot)
  SLOT  PILL  ATTEMPTS
  ----  ----  -
    0     J      9
    1     E      1
    2     A      1
    3     H      3
    4     B      1
    5     F      1
    6     I      1
    7     D      1
    8     G      1
    9     C      2
Total Attempts  21

Report (sorted by Pill)
  SLOT  PILL  ATTEMPTS
  ----  ----  -
    2     A      1
    4     B      1
    9     C      2
    7     D      1
    1     E      1
    5     F      1
    8     G      1
    3     H      3
    6     I      1
    0     J      9

-----
Process exited after 0.08418 seconds with return value 0
Press any key to continue . . .
```