Lab 5 Report

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1 Objectives

The objective of this lab was to explore the concept of exceptions and templates. These are important aspects of object oriented programming. With templates they help to ensure that code is versatile and can be used later on without being rewritten. Exceptions allow for the code to control how the code runs and which edge cases are not able to be crossed. This is important to the entire field of CS as it helps to prevent bugs and vulnerabilities.

2 Tasks

2.1 Task 1

The shelf utilized a first in, last out approach which works well with arrays. We utilized a variable which would count how many items were in the shelf. To add we would first add an object and then move the counter. To remove we would move the counter back and return the object it was on.

2.2 Task 2

```
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
     isk
escription for game:
long strategy game
ress 1 to add a board game to shelf
ress 2 to remove a board game from shelf
ress 3 to see how many board games are on shelf
ress 4 to exit
                                                                                                                                                                                                                                Choice: 1
Title for game:
                                                                                                                                                                                                                                Risk
Description for game:
                                                                                                                                                                                                                               Description for game:
A long game
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
Choice: 1
Title for game:
Chess
Description for game:
   Title for game:
         scription for game:
Description for game.
Oh no no
Oh no no
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
Chaire: 2
Press 4 to ex
Choice: 2
Game details:
Title: Chess
Description:
Oh no no
                                                                                                                                                                                                                                Description for game:
The Funzies
                                                                                                                                                                                                                               Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
(hnica: 2
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
Choice: 2
Game details:
Title: Risk
Description:
A long strategy game
                                                                                                                                                                                                                               Press 4 to exit
Choice: 3
Number of games 2
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
Choice: 2
Game details:
                                                                                                                                                                                                                                Game details:
Title: Chess
  Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
                                                                                                                                                                                                                                Description:
The Funzies
                                                                                                                                                                                                                                Press 1 to add a board game to shelf
                      of games 0
to add a board game to shelf
to remove a board game from shelf
to see how many board games are on shelf
to exit
                                                                                                                                                                                                                                Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
Choice: 4
```

Figure 1: Using the Shelf Class

2.3 Task 3

The advantage of trapping an error in a class is that if there is a default way of handling the error then this would always occur. This also means that code would not need to rely on its implementer to function without passing an exception. This can help the program to still function after the user performs an action which was unexpected.

```
Press 1 to add a board game to shelf
                                                        Press 2 to remove a board game from shelf
Press 1 to add a board game to shelf
                                                        Press 3 to see how many board games are on shelf
Press 2 to remove a board game from shelf
                                                        Press 4 to exit
                                                        Choice:
Press 3 to see how many board games are on shelf
Press 4 to exit
                                                        Number of games 10
Choice: 3
                                                        Press 1 to add a board game to shelf
Number of games 0
                                                        Press 2 to remove a board game from shelf
                                                        Press 3 to see how many board games are on shelf
Press 1 to add a board game to shelf
                                                        Press 4 to exit
Press 2 to remove a board game from shelf
                                                        Choice:
Press 3 to see how many board games are on shelf
                                                         Title for game:
Press 4 to exit
                                                        Default Game
Choice: 2
                                                        Description for game:
Shelf is empty
                                                        This can't fit
                                                        Shelf is full
```

(a) Empty Exception

(b) Full Exception

Figure 2: Task 3 Screenshots

2.4 Task 4

Using a template will save time code as well as ensure that this code remains versitile in the future. It also saves memory space as potentially less code has to be loaded as only what is going to be used is loaded instead of every possible combination. This also allows code to work with user made objects as well and saves the programmer who uses the code time of creating an implementation which works with their code if it works in the general template.

```
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
Choice:
Title for game:
This is a template
Description for game:
How quaint
Rating for game:
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
Choice:
Title for game:
Description for game:
we are not what we were
Rating for game:
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
Choice:
Game details:
Description:
we are not what we were
Current Rating: 3
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
Number of games 1
Press 1 to add a board game to shelf
Press 2 to remove a board game from shelf
Press 3 to see how many board games are on shelf
Press 4 to exit
```

Figure 3: Task 4 Screenshot

3 Conclusion

3.1 Contributions

Chad – Created Shelf Declaration

- Created Testing Function

- Implemented Template Class

- Created Lab Report

Colton – Created Shelf Implementation

- Created Initial Template Class

- Assisted Testing Function

3.2 Compiling

All the code is precompiled into a windows executable. However in the event that fails to run it can be compiled with a mingw g++ compiler or by throwing it into Visual Community. If those do not work please contact Chad with any issues.