Assignment 3: Basic Command Shell

November 29, 2018

Fall 2018

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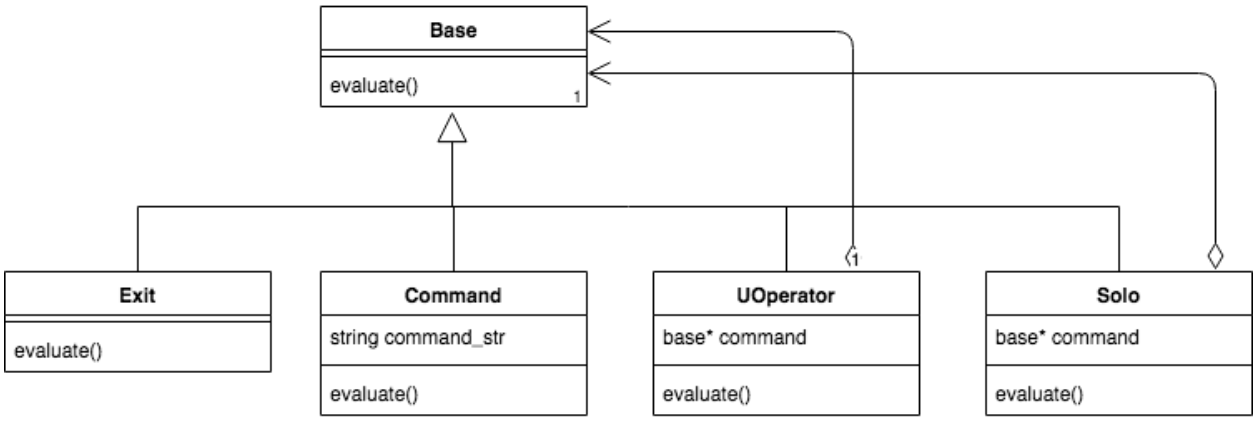
Introduction

Our project design is composed of 9 different classes. We have the Base class, and 5 composites which would be the Operator, UOperator, AndCommand, OrCommand, and the Solo class. The Parse class is used for parsing the command line string and we have two leaves: the Exit class and the Command class. These classes are used to define and execute the command line string that is received via user input. Directly after user input is given, the Parse class is used to parse the string into a vector of command objects. It then iterates through that vector and executes the commands via the connectors.

Diagram:



Class Groups:

Parse:

The parse class is used to parse the command line string into a vector of command objects. It is also responsible for handling the connectors and the different “chunks” (command objects with parenthetical precedence) by using recursion through parsing the chunks and executing them afterwards.

Base:

Our Base class is a simple implementation of the composite pattern with one virtual function “evaluate” that returns a string.

UOperator:

Our UOperator class plays as a composite. This composite will be used to implement the Solo class after being passed in by the parser. This composite holds the virtual evaluate function for the Solo class to fulfill. The UOperator also has a constructor that takes in one Command object to assign a command.

Operator:

Our Operator class plays as a composite as well. This composite will be used to implement the AndCommand and OrCommand classes after being passed in by the parser. This composite holds the virtual evaluate function for the AndCommand and OrCommand class to fulfill. The Operator also has a constructor that takes in two Command objects to be assigned a command.

AndCommand:

The AndCommand is a class that is used to handle the connector “AND” and the logic behind whether or not the right most command should be executed. It has an additional “execute” function which calls execute on the command if the previous result (which is also a native variable) is a 1.

OrCommand:

The OrCommand is a class that is used to handle the connector “OR” and the logic behind whether or not the right most command should be executed. It has an

additional “execute” function which calls execute on the command if the previous result (which is also a native variable) is a 0.

Solo:

The solo class handles the commands that are always required to be run. For example: every first command and every command following a semi colon are to be executed. These commands are sent to the Solo class because it does not require a previous result to determine whether the function should be executed or not.

Command:

The command class plays as a composite for the Exit class. In order for the user to exit the program, they would need to enter in an exit command. The command class also takes in a string in the constructor to assign a specific string command to the object. This class also contains an evaluate function which returns a string.

Exit:

The exit class is created when the user wants to exit from the RShell. Once they type in Exit, we will call the Exit class to create the object, and runs “exit(0)” to end.

Coding Strategy:

This program is a result of consistent backtracking, reformatting, and re-development. Upon initial consideration of this project, our thoughts and methodologies on how to complete this were much different than what they are today. We decided to follow the composite pattern more closely and to put the parsing functionality into its own file and separate the different stages of parsing the command line string. We expanded the composite classes the handle the different commands that are passed in from the parser and instead of determining whether or not a function should be executed inside of the parse function, we instead give that responsibility to the AndCommand and

OrCommand classes. We also changed to a result of returning and handling double type variables instead of strings.

Roadblocks:

The roadblocks that we have encountered with this part of the project is the infinite error checking and possible mistakes that could be made by the user input. We had quite a bit of trouble with the parsing algorithm, but are pleased with the final result. Apart from the error checking, this portion of the program was largely a test of our earlier development decisions and it really showed us how poorly we developed this program for our assignment 2. We now understand the importance of having a good design before developing the program much better.