

# Assignment 4

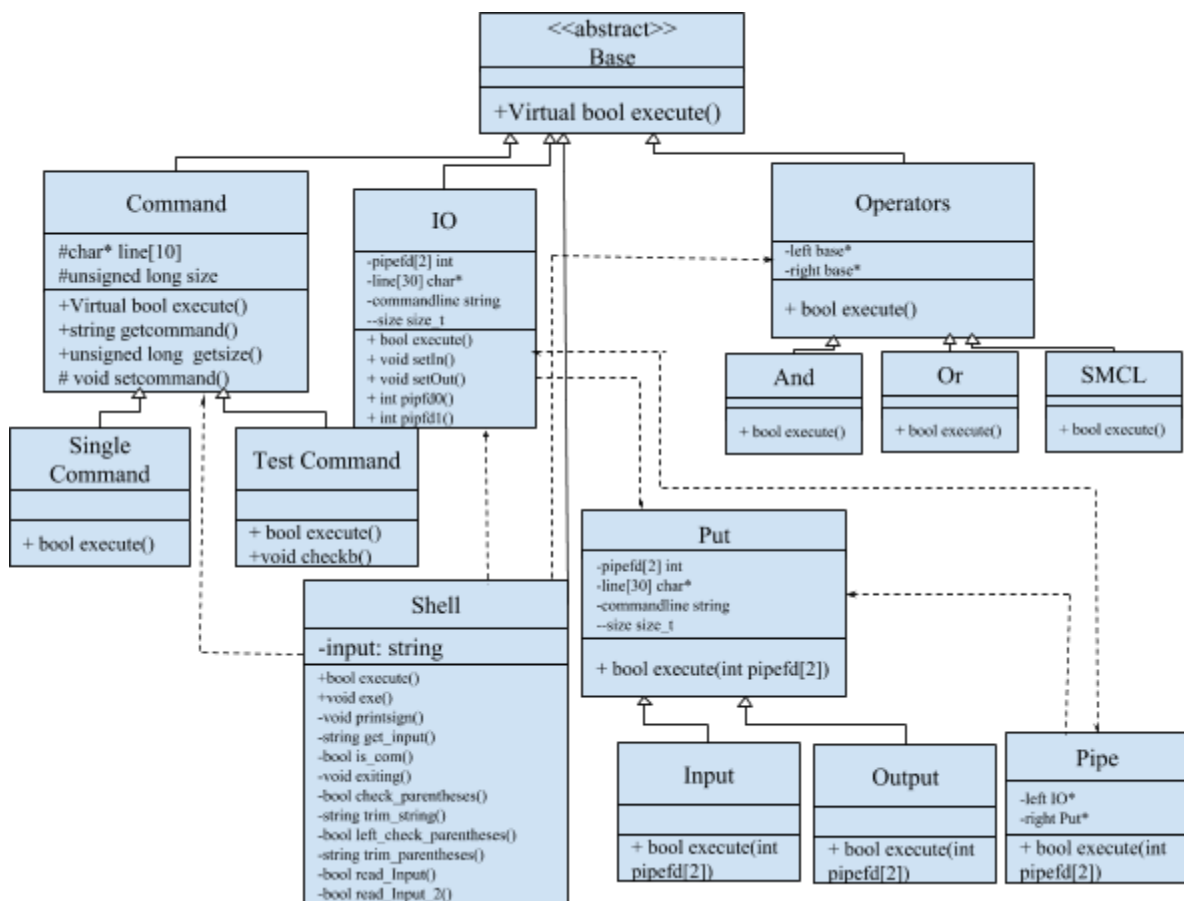
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- **Introduction:** Rshell is a remote shell, and it is a basic command shell. It can print the command prompt, read commands and execute the command using “fork”, “execvp”, and “waitpid”. It is also developed to accept redirection operations by using “dup” and “pipe”.

- **Diagram:**



- **Classes/Class Groups:**
  - The base class is the top class of rshell. It only has virtual `bool execute()` function in it, and `execute()` is a pure virtual function.
  - Command class is an inheritance from the Base class. We use it to manage the command such as “ls”, “exit”, and so on. It is also a structure of each command.

There is a private character pointer called “line”, which stores the name of the command.

- Single Command and Test Command classes are inheritance from Command class. The single command class used to run every single command. The test command class used to check the input command is exist or not.
  - Operators class is an inheritance from Base class. It is a structure of operator classes. Protected Base\* left and right values are used to store the command on the two sides of the operator. Operator(\*left, \*right) is used to save the outside commands into the operator class.
  - AND, OR and SMCL the operator classes for “&&”, “||” and “;”. execute() function is used to decide which command execute first and which command execute second.
  - Shell class is an inheritance from base class. It is used to read and execute the command includes “exit” command. The private string “input” is used to store the command line input. If there is an error, it will return the error message. Otherwise, it will run the commands. It is also accept valid parentheses to assign different precedence operators.
  - IO class is an inheritance from base class. To detect the “<”, “>”, “>>”, and “|” and initialize the cooreponding variables.
  - Put class is a virtual class for Input class and Output class. The Input class is operating the input redirection. The Output class is operating the output redirection. The pipe class is connect the Put class and IO class to operate the piping.
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- **Coding Strategy:** My partner and I are friends, so we can make an appointment easily to study together. For this assignment, Jia will in charge of the Base class, the command class, and the subclasses of the command class. I will in charge of the Operators classes and its subclasses, and I also in charge of gtest parts. Because we can finish the assignment face to face, we can just write our classes and use git push to integrate the segments together.
  
  - **Roadblocks:** For example, both of us are not very good at the inheritance, so we might have the problem to connect each class together. Our strategy is to visit the TA because they could explain the details of how to deal with the problems. The gtest is still new for

us, so we might get the problem when testing the program. Our strategy is searching on google to learn more about the Google test.