**General Method used in testing**

* System Testing through the console to check for bugs in the output
* Using junit to perform unit, test, integration test and system test
* Create a “BugTest” source folder which contains all the Junit testing for the program
* “BugTestFiles” folder contains the input and expected output files for the application
  + Folders are labelled according to the application it was used. E.g. wcFiles, sortFiles

**Bug Reports**

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| No. | Description | Testcase | Comments |
| 1 | “head input.txt -n 4” was not able to display the first 4 lines of the input.txt file | TestBugHeadApp.java   * testWithPathAndLineNumber()   Command   * head input.txt -n 4   Expected Output   * “n1 \nn2 \nn3 \nn4” | [Option] can be in any order |
| 2 | “head -n 4 -n 2 input.txt” was not able to display the first 2 lines of the input.txt file | TestBugHeadApp.java   * testWithPathAndMultipleLineNumber()   Command   * head -n 4 -n 2 input.txt   Expected Output   * “n1 \nn2” | No assumption on whether to override the previous line number command or throws exception |
| 3 | “head -n 4 input.txt input.txt” was not display the first 4 lines of multiple files | TestBugHeadApp.java   * testWithPathAndMultiplePath()   Command   * head -n 4 input.txt input.txt   Expected Output in “Test Files” folder   * “n1 \nn2 \nn3 \nn4 \n n1 \nn2 \nn3 \nn4” |  |
| 4 | “tail input.txt -n 4” was not able to display the last 4 lines of the input.txt file | TestBugTailApp.java   * testWithPathAndLineNumber()   Command   * tail input.txt -n 4   Expected Output   * “n6 \nn7 \nn8 \nn9” | [Option] can be in any order |
| 5 | “tail -n 4 -n 2 input.txt” was not able to display the last 2 lines of the input.txt file | TestBugTailApp.java   * testWithPathAndMultipleLineNumber()   Command   * tail -n 4 -n 2 input.txt   Expected Output   * “n8 \nn9” | No assumption on whether to override the previous line number command or throws exception |
| 6 | “tail -n 4 input.txt input.txt” was not able to display the last 4 lines of multiple files | TestBugTailApp.java   * testWithPathAndMultiplePath()   Command   * tail -n 4 input.txt input.txt   Expected Output in “Test Files” folder   * “n6 \nn7 \nn8 \nn9\n n6 \nn7 \nn8 \nn9” |  |
| 7 | "sort `cat input.txt | head -n 1`" was not able to display the sorted input | TestCommandSubstitution.java   * testSortingCatFile()   Command   * sort `cat input.txt | head -n 1`   Expected Output   * “n1” |  |