Lab 6 Report

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Instructions:
All necessary .cpp and .h files are contained within the visual studio project submitted. Files can be run and compiled like a normal visual studio project. A sample test text file “test.txt” is also provided in the correct folder for the file input option.

Write a lab report including the following information:

a. A description of the objectives/concepts explored in this assignment including why you think they are important to this course and a career in CS and/or Engineering.

This week we discussed stacks and queues - which we also used in this week's lab. Stacks and queues are important to this course as they’re foundational data structures that are useful when adding and removing items in particular orders. This would be useful to a career in CS because different data structures are useful for different circumstances. For example, stacks and queues are used for depth-first-search and breadth-first-search in graph traversals. The objectives of the lab enforced this way of thinking, as we needed to first enqueue the words from a file or command line to the queue, so that we could then dequeue them (and push the letters into a stack) while preserving the order of the words. Popping the letters off of the stack then reversed the order of the letters. This was the main objective of the lab which is simple to achieve if you have a good understanding on how stacks and queues work. Understanding the strengths and weaknesses of different types of data structures is essential to a career in CS.

b. The sections from each task indicated to be included in the lab report.

Task 3: 6. Include in the lab report a screenshot(s) of the output of a test. Include a diagram of what the stack and queue look like in solving the sample above (you may need to show various views of a single stack and queue).

Screenshots:

Terminal Attempt:

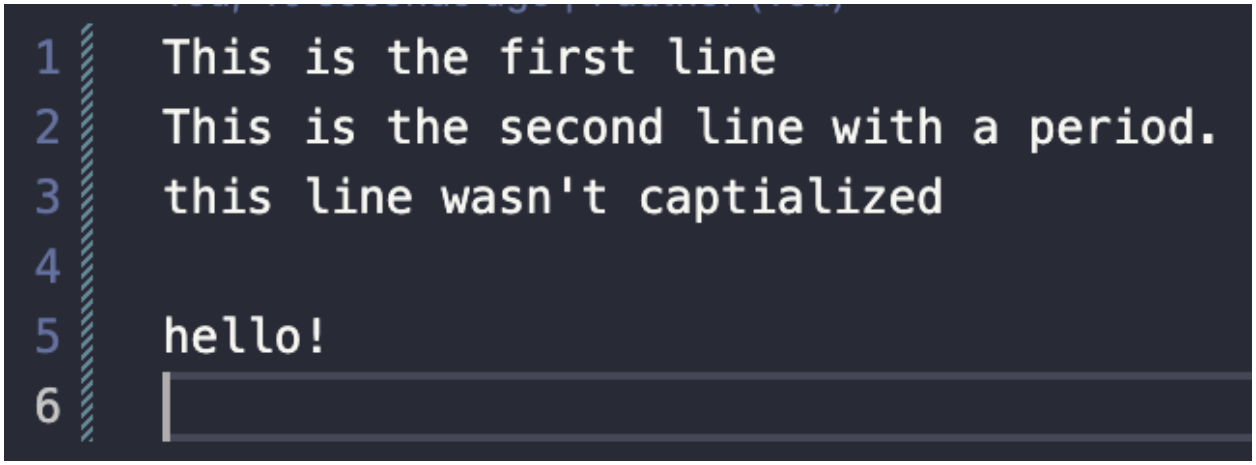
```
Enter 0 for File / Enter 1 for Terminal:
> 1

Please enter your line of text:
> Sam is the birthday boy!

Reversed String:
maS si eht yadhtrib !yob

Would you like to continue?
Enter 0 for File / Enter 1 for Terminal (Anything else to quit):
>
```

File Content:



File Attempt:

```
Enter 0 for File / Enter 1 for Terminal:
> 0

Please enter the file name:
> text.txt
Error: File Name Provided Could Not Be Opened
Please try again:
> test.txt

Reversed String:
sihT si eht tsrif enil sihT si eht dnoces enil htiw a .doirep siht enil t'nsaw dezilaitpac !olleh

Would you like to continue?
Enter 0 for File / Enter 1 for Terminal (Anything else to quit):
> 3

randyhucker@randys-mbp Task3 %
```

Diagram:

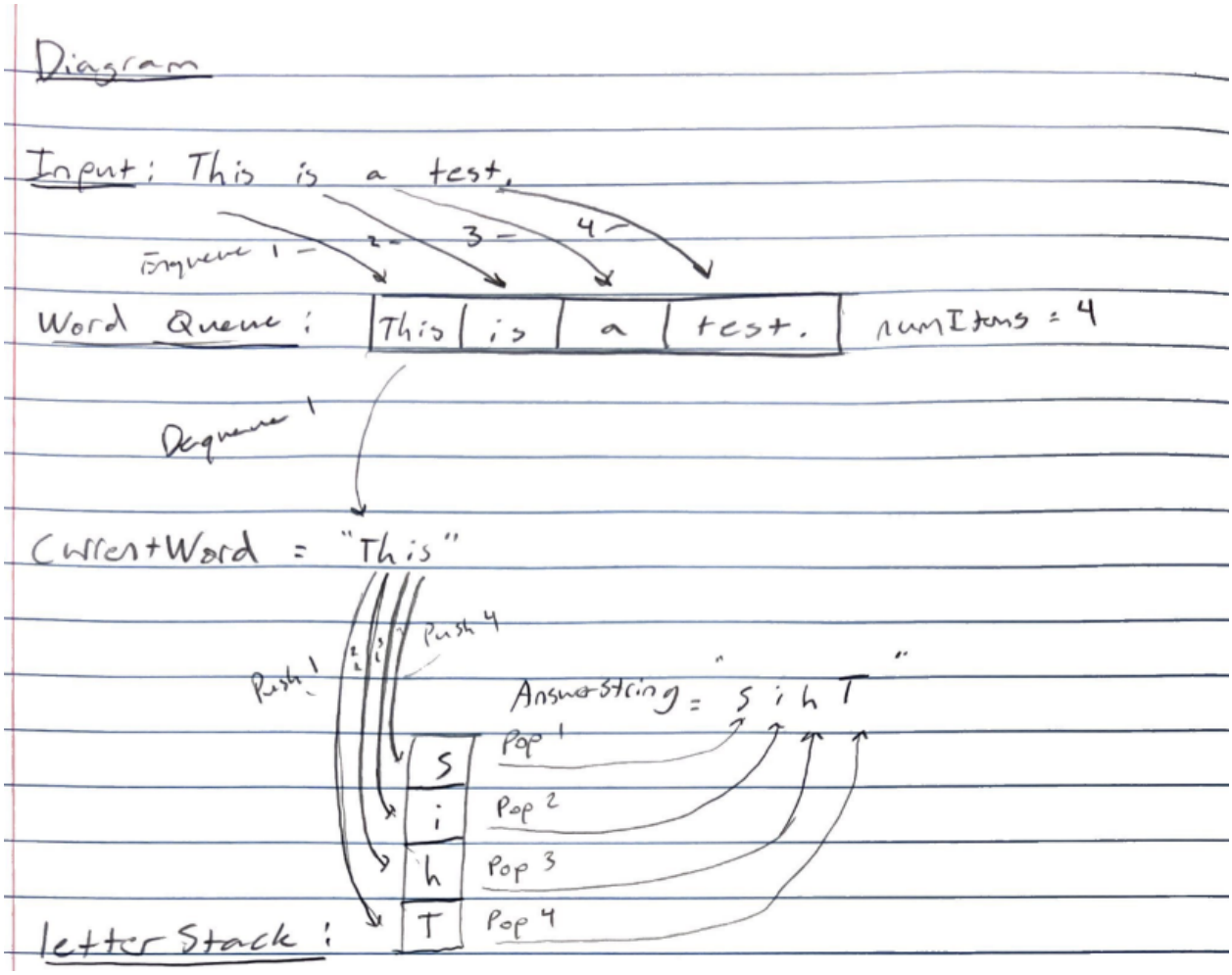


Diagram
Input: This is a test.
Enqueue 1
2
3
4
Word Queue:
This
is
a
test.
numItems = 4
Dequeue 1
CurrentWord = "This"
Push 1
Push 4
Answer String = "s i h T"
Pop 1
Pop 2
Pop 3
Pop 4
s
i
h
T
letterStack:

numItems = 3

Word Queue: | is | a | test. | test. |

Dequeue 2

CurrentWord = "is"

Push 2

Push 1

letterStack: s, i

Answerstring = "si"

Pop 1

Pop 2

numItems = 2

Word Queue: | a | test. | test. | test. |

Dequeue 3

CurrentWord = "a"

Answerstring = "si a"

Push 1

letterStack: a

Pop 1

numItems = 1

Word Queue: | test. | test. | test. | test. |

Dequeue 4

CurrentWord = "test."

Answer String = ".tset a is"

Push 1

letterStack: ., t, s, e, t

Pop 1

Pop 2

Pop 3

Pop 4

Pop 5

numItems = 0

Output: ".tset a is"