

CP2-4

The problems in this problem set cover lectures C2, C3, and C4.

1.

Part a. Write an algorithm to check if a user entered string is a palindrome.

Assume:

- i. Maximum string length is 80 characters
- ii. The actual string length is input dependent

Part b. Implement your algorithm as an Ada95 program.

Turn in a hard copy of your algorithm and code listing; and an electronic copy of your code.

2. Modify the program above to read inputs from a text file and store the reversed string in an output text file. The program should:

- a. If the line of text is a palindrome, store it in the output file.
- b. If it is not a palindrome, reverse the line of text and store the reversed line of text in the output file.
- c. Repeat the above steps until there are no more inputs to be processed from the input file.

Assume:

- i. Input file name is my_program_input.txt
- ii. Output file name is my_program_output.txt

Turn in a hard copy of your algorithm and code listing and an electronic copy of your code.

3.

a. Compare and contrast stacks and queues.

Hint: Summarize the operations on stacks and queues using a table and use a diagram to show the difference between basic operations.

b. Modify the expression conversion algorithm shown in class to include unary operators.

Hint:

- i. Unary operators operate on only one argument. -5, +9 etc
- ii. How do you distinguish between a unary and binary operator? (Think about the number of arguments)

- iii. Use the following test expression $-5 + 9 + -6 + 2$ to see if the conversion works.

Assume:

- i. The unary operators are only '+' and '-'.
- ii. Inputs are user input strings of maximum length 80.

c. Implement your algorithm as an Ada95 program.

Turn in a hard copy of your algorithm and code listing, and an electronic copy of your code.