Assignment 10
Due on 2009-11-05, 20:59:51

1. Write the following in a style appropriate for computer programming:
   a. Write a function that calculates the factorial of a number.
   b. Write a function that checks if a number is prime.
   c. Write a function that sorts an array in ascending order.
   d. Write a function that searches for an element in a sorted array.

2. Explain the difference between a stack and a queue data structure.

3. Implement a stack and a queue using linked lists. Include the necessary functions for push, pop, and enqueue operations.

4. Write a program that reads a file containing a list of numbers and calculates the average of the numbers.

5. Write a function that calculates the reverse of a string.

6. Write a program that reads a file containing a list of words and counts the occurrences of each word.

7. Implement a binary search algorithm for searching a sorted array.

8. Write a program that reads a file containing a list of integers and prints the maximum and minimum values.

9. Write a program that reads a file containing a list of floating-point numbers and calculates the sum and average.

10. Write a program that reads a file containing a list of strings and prints the longest string.

11. Write a program that reads a file containing a list of integers and prints the median value.

12. Write a program that reads a file containing a list of integers and prints the mode value.

13. Implement a program that simulates a simple bank account system with operations like deposit, withdraw, and check balance.

14. Write a program that reads a file containing a list of names and prints the names in alphabetical order.

15. Write a program that reads a file containing a list of temperatures and converts them from Celsius to Fahrenheit.

16. Write a program that reads a file containing a list of dates and prints the youngest and oldest dates.

17. Write a program that reads a file containing a list of strings and prints the longest palindrome.

18. Write a program that reads a file containing a list of integers and prints the sum of all even numbers.

19. Write a program that reads a file containing a list of strings and prints the number of unique strings.

20. Write a program that reads a file containing a list of integers and prints the first and last unique values.

21. Write a program that reads a file containing a list of integers and prints the number of prime numbers.

22. Write a program that reads a file containing a list of strings and prints the number of vowels in each string.

23. Write a program that reads a file containing a list of integers and prints the number of positive and negative numbers.

24. Write a program that reads a file containing a list of strings and prints the number of occurrences of each character.

25. Write a program that reads a file containing a list of integers and prints the number of even and odd numbers.

26. Write a program that reads a file containing a list of strings and prints the number of strings starting with a specific character.

27. Write a program that reads a file containing a list of integers and prints the number of perfect squares.

28. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific substring.

29. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific digit.

30. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific letter.

31. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific word.

32. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific phrase.

33. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific character.

34. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific symbol.

35. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific punctuation mark.

36. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific combination of characters.

37. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific sequence of numbers.

38. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific sequence of letters.

39. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific sequence of symbols.

40. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific sequence of punctuation marks.

41. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific sequence of numbers and letters.

42. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific sequence of numbers and symbols.

43. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific sequence of numbers and punctuation marks.

44. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific sequence of letters and symbols.

45. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific sequence of letters and punctuation marks.

46. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific sequence of letters, numbers, and symbols.

47. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific sequence of letters, numbers, and punctuation marks.

48. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific sequence of letters, numbers, symbols, and punctuation marks.

49. Write a program that reads a file containing a list of integers and prints the number of strings containing a specific sequence of letters, numbers, symbols, and punctuation marks.

50. Write a program that reads a file containing a list of strings and prints the number of strings containing a specific sequence of letters, numbers, symbols, and punctuation marks.