Problem Solving Steps

Program Assignment #3

**Problem #1**

Program for Question 1: (35 points) Write a Python program using file operation. You will open an input file “students.dat” that will contain a list of student names, classification, and grade in the class. (All student info is completely made up) You should read through the entire input file. After reading in all information, do operations (No built-in functions like Average, min, max, count, etc.), close the input file and write that following information with labels to an output file “student\_statistics.txt”

• Highest grade in the class

• Lowest grade in the class

• Class average grade (rounded to one decimal place)

• Number of freshmen students

• Number of sophomore students

• Number of junior students

• Number of senior students

1. **State the required output:**

File with the Students that made the highest and lowest grades, and. A break down of the class by year of the student

1. **State the necessary input items:**

Students.dat

1. **State the formulas necessary:**

Parsing the string data written in from the dat file

Incrementing counters

1. **List the steps in order:**

Open file

Read in data

Parse strings

Increment appropriate counters

Open out file

Write data to out file

Close Input and output files

**Problem #2**

(35 points) Given an array of strings, group the anagrams together. You can return the answer in any order. An Anagram is a word or phrase formed by rearranging the letters of a different word or phrase, typically

using all the original letters exactly once.

1. **State the required output:**

* Printing the list of Anagram lists.

1. **State the necessary input items:**

* List of words hard coded

1. **State the formulas necessary:**

* No formulas
* Loops to go through the strings, sort and then compare to find anagrams

1. **List the steps in order:**

* Send the list of words to a function
* Loop through the elements of the list
  + Take the string, sort the letters and compare to a dictionary key
  + If key not found add the key and (unsorted)word
  + Add word to a list
* Add list to Anagrams list

**Problem #3**

(30points)Write the OOP program in pythonusing class.Assuming you have four

classes: Bank account which is theparent class and it has two child classes Saving

Account class and Checking account class. Customer is another class who has a bank

account; either saving or checking or both. Implement the scenario using python OOP

and make sure you have covered those OOP concepts on your code: inheritance(any),

polymorphism (runtime and compile time), abstraction and encapsulation.

**State the required output:**

* Print to console

1. **State the necessary input items:**

* User input from console

1. **State the formulas necessary:**

* Just addition and subtraction

1. **List the steps in order:**

* Capture user input in a variable as a string
* If the input should be a number, convert
* Print menu
* Get user input
* Do operation depending on user input
* Exit program