AP Free Response Create Task Solutions Name:

4 Questions(Question 1, 2a), 2b), 2c))

30% of AP Score

6 points total(4 points for 4 FRQ, 1 pt for video, 1pt for program code/PPR)

Sample Questions 1

Sample Solutions for sample create task code below:

A screenshot of a computer program

Description automatically generated

**Written Response 1: Program Design, Function, and Purpose:**

Identify an expected user of your program. Describe one way your program’s design meets the needs of this user.

**An expected user of the program is a teacher who wants the ability to search for students based on their academic performance given by their grade point averages(GPAs). The teacher wants to be able to see a list of students with lower GPAs so that she can offer more support. In addition, the teacher also wants the ability to see higher performance students. The teacher has access to a text file containing the student’s name and gpa.**

**The program asks the user to enter the name of the text file. The program’s design meets the needs of the teacher by asking the teacher to enter either “high” or “low”. If the teacher enters “low”, then the program will print out the list of names of students whose GPA is less than or equal to 2.0. If the teacher enters “high”, the program will print out the list of names of students whose GPA is greater than 2.0. In either case, the program prints out the name of students according to the teacher’s input as required.**

**Written Response 2(a): Algorithm Development:**

Consider the first iteration statement included in the Procedure section of your Personalized Project Reference. Identify the number of times the body of your iteration statement will execute. Describe a condition or error that would cause your iteration statement to not terminate and cause an infinite loop. If no such condition or error exists, explain how the loop could be modified to cause an infinite loop.

**The first for loop will run as many times as the length of the list of students. Since this list is read from a text file, its length depends on how many items are in that file.**

**The way the for loop is currently written, the i variable initializes to 0 and automatically increment by 1 until it terminates at i = length of list – 1. This loop will not cause an infinite loop.**

**A while loop in Python cause an infinite loop if the counter variable i is not updated correctly:**

**i = 0**

**while i < len(students):**

**…**

**i += 1**

**If the line i+=1 is not in the body of the while loop, this loop will cause an infinite loop.**

**Written Response 2(b): Errors and Testing:**

Consider the procedure included in part (i) of the Procedure section of your Personalized Project Reference. Describe a change to your procedure that will result in a run-time error. Explain why this change will result in a run-time error.

**Solution 1:**

**If we change the body of the first for loop to**

**n, g = students[i+1]**

**then we have an index out of range error, which is a run-time error.**

**Solution 2:**

**If we change the body of the first for loop to**

**for i in range(len(students)+1):**

**then we have an index out of range error, which is a run-time error.**

**Written Response 2(c): Data and Procedural Abstraction:**

Suppose you are provided with a procedure called **isEqual(value1, value2)**. The procedure returns **true** if the two parameters **value1** and **value2** are equal in value and returns **false** otherwise. Using the list you identified in the List section of your Personalized Project Reference, explain in detailed steps an algorithm that uses **isEqual** to count the number of times a certain value appears in your list. Your explanation must be detailed enough for someone else to write the program code.

**Here's an algorithm that count the number of students with a certain gpa called this\_gpa.**

**Initialize the count to 0. For each student in the list, extract the gpa of the student and store it in a variable called gpa. Check to see if this gpa value is equal to this\_gpa by calling the procedure isEqual(gpa, this\_gpa). If the returned value of that call is True, add 1 to the count. Outside of the for loop, print out the value of count.**