Example Design Document

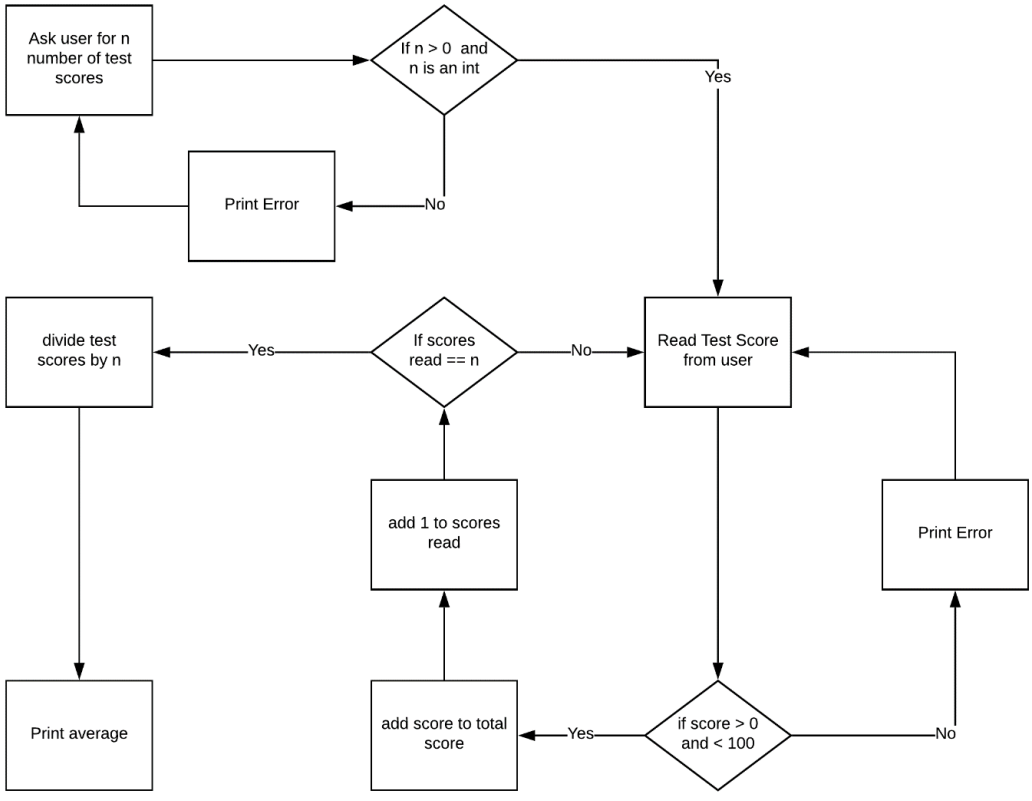
Problem Statement: Write a program that continues to ask the user for n tests scores. These test scores should **range from 0 to 100**, and your program needs to check that the scores supplied are valid numbers before moving forward. This may include making sure the user doesn't enter a letter or string of letters.

- Ask the user for the number of test scores they want to enter.
- Repeatedly, ask the user for the number of test scores.
    - For each test score received, check that the test score is a number and it is between 0-100.
    - Print an error message if the number is not in this range, and re-prompt the user for another number.
- After receiving good test scores, then calculate the average and output it to the screen.

Understanding the Problem: This problem is asking me to read an unsigned whole number value, n, from the user, and then read n unsigned real numbers, which represent test scores, from the user. These scores need to be between 0 and 100, as well as a valid real number. If the user doesn't enter a valid number or a number in the range, then an error message is printed, and the user is prompted to enter a new number without taking away from the n valid numbers the user is entering. After the user enters n valid real numbers in the range 0-100, then the average is calculated and printed to the screen.

I am assuming the number of tests is an unsigned whole number.
I am summing the test scores can be unsigned real numbers, instead of just integers.
I am assuming that errors in the user input does not count against the n numbers n enter.

Devising a Plan/Design: *(flowchart)*



Devising a Plan/Design: *(pseudocode)*

```
ask user to input number of scores
read n test scores from user

//make sure num scores are valid numbers
while n < 0 or not an input
    print error
    ask for new input
    read n from user

// get each test score from user
for each test score n
    ask user for score
    read score from user

    // make sure scores are valid numbers
    while score > 100 and < 0 or not an int
        print error
        ask for new score
        read score from user

    add score to total score

average = total score / n

print average
```

Testing:

Value *(values the user may put into the program including those that are not intended to be)*	**Expected** *(What I theoretically want to happen when the values are input into the program)*	**Actual meet expectation** *(Does my program actually do what I want it to for these values)*
n = 0	Nothing, just exit	Yes
n = 1.5	Error message and reprompt the user for a good n value	Yes
n = 1	Prompt user for 1 test score	yes
n = 5	Prompt user for 5 tests	yes
test score = -1	Error message and reprompt the user for a good test value. This should not count as one of the n tests.	yes
test score = 100.5	Error message and reprompt the user for a good test value. This	Yes

	should not count as one of the n tests.	
test score = 0	Continue to prompt for another test score.	Yes
n = 1, test score = 100	Average should be 100	yes
n = 1, test score = 100.5, test score = 0	Error message for test score, re-prompt for a new test score, and only use valid n tests in average. Average should be 0	yes
n = 3, test score = 100, test score = 0, test score = 50	Average should be 50	yes