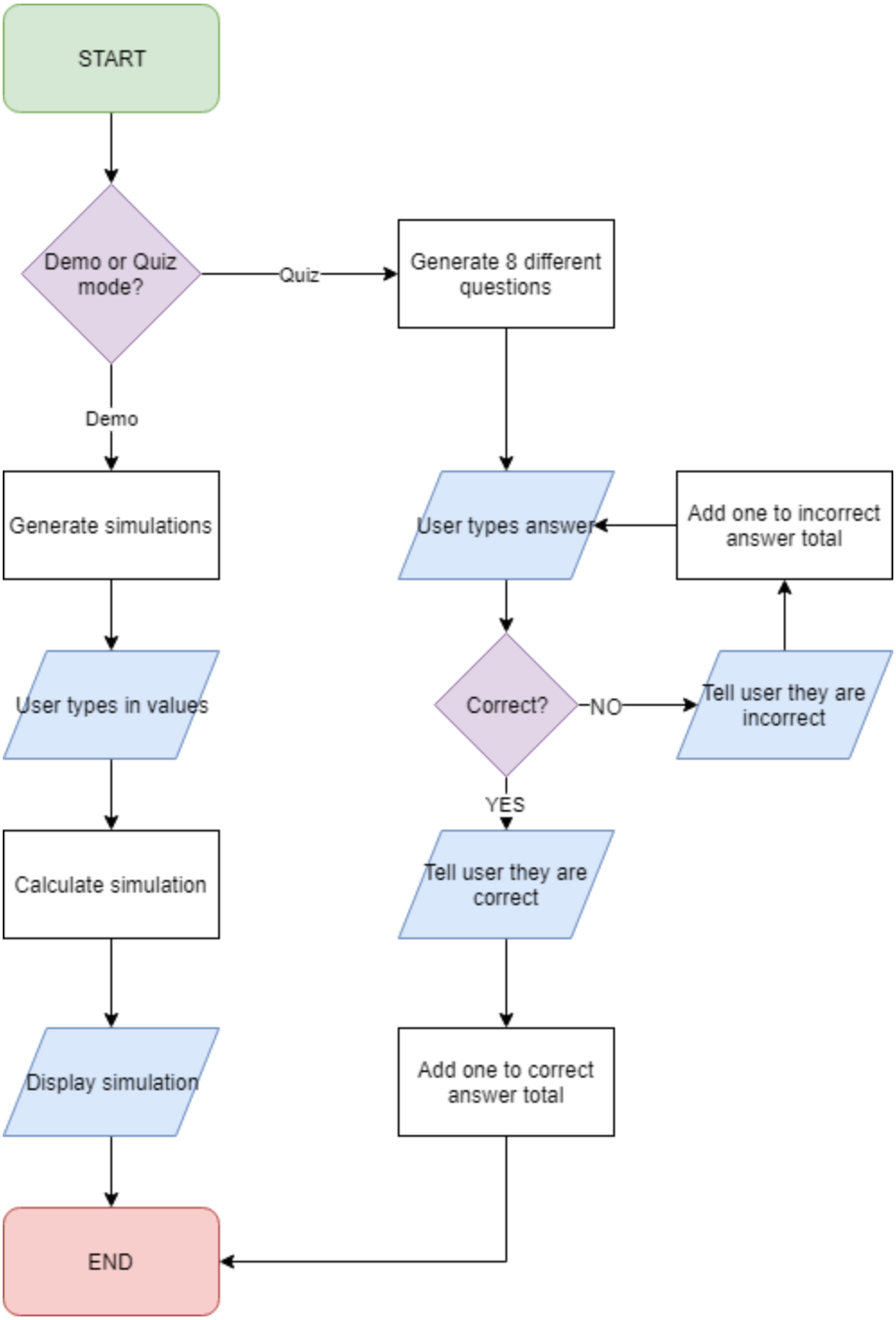
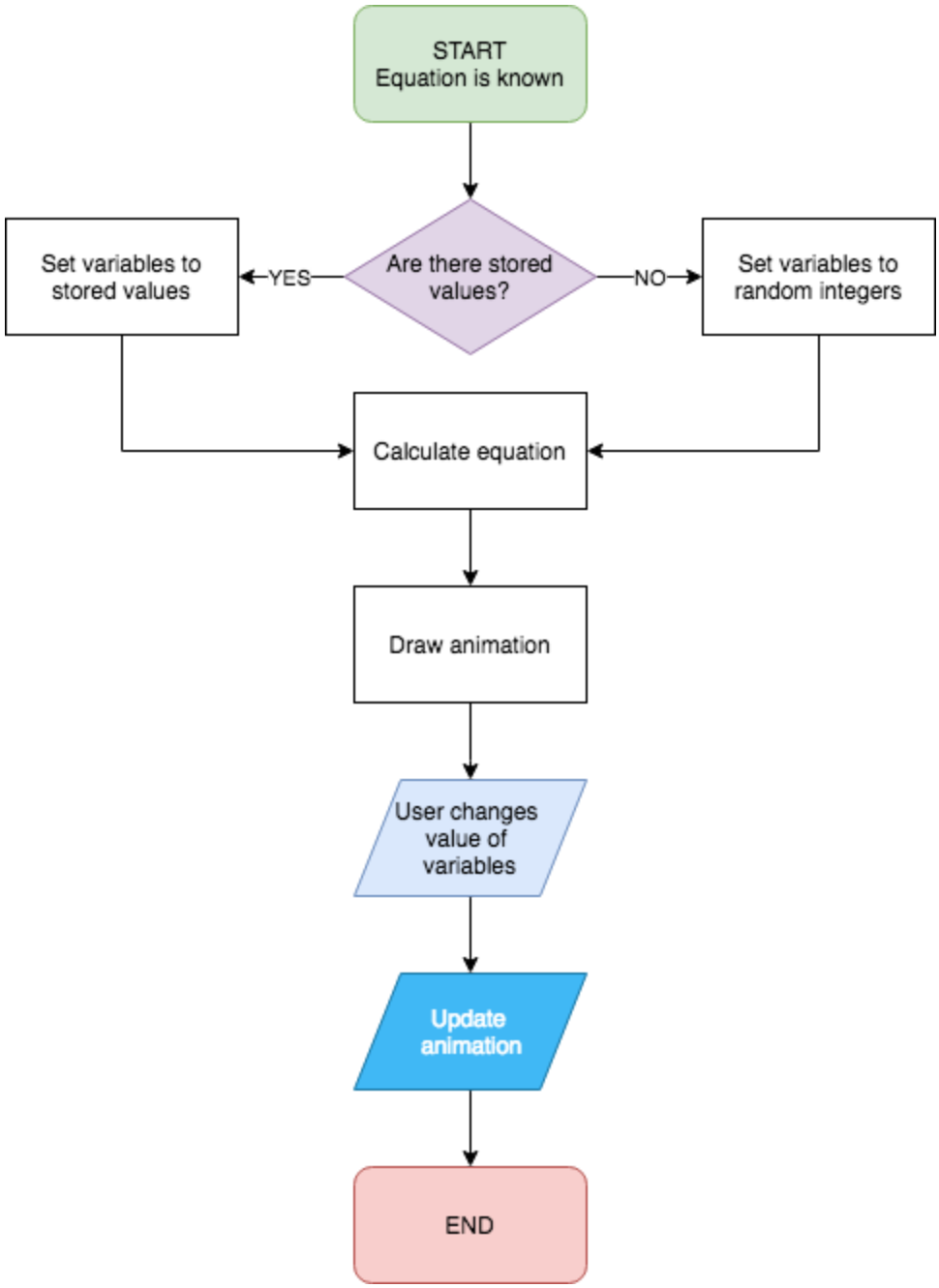
Criterion B: Design

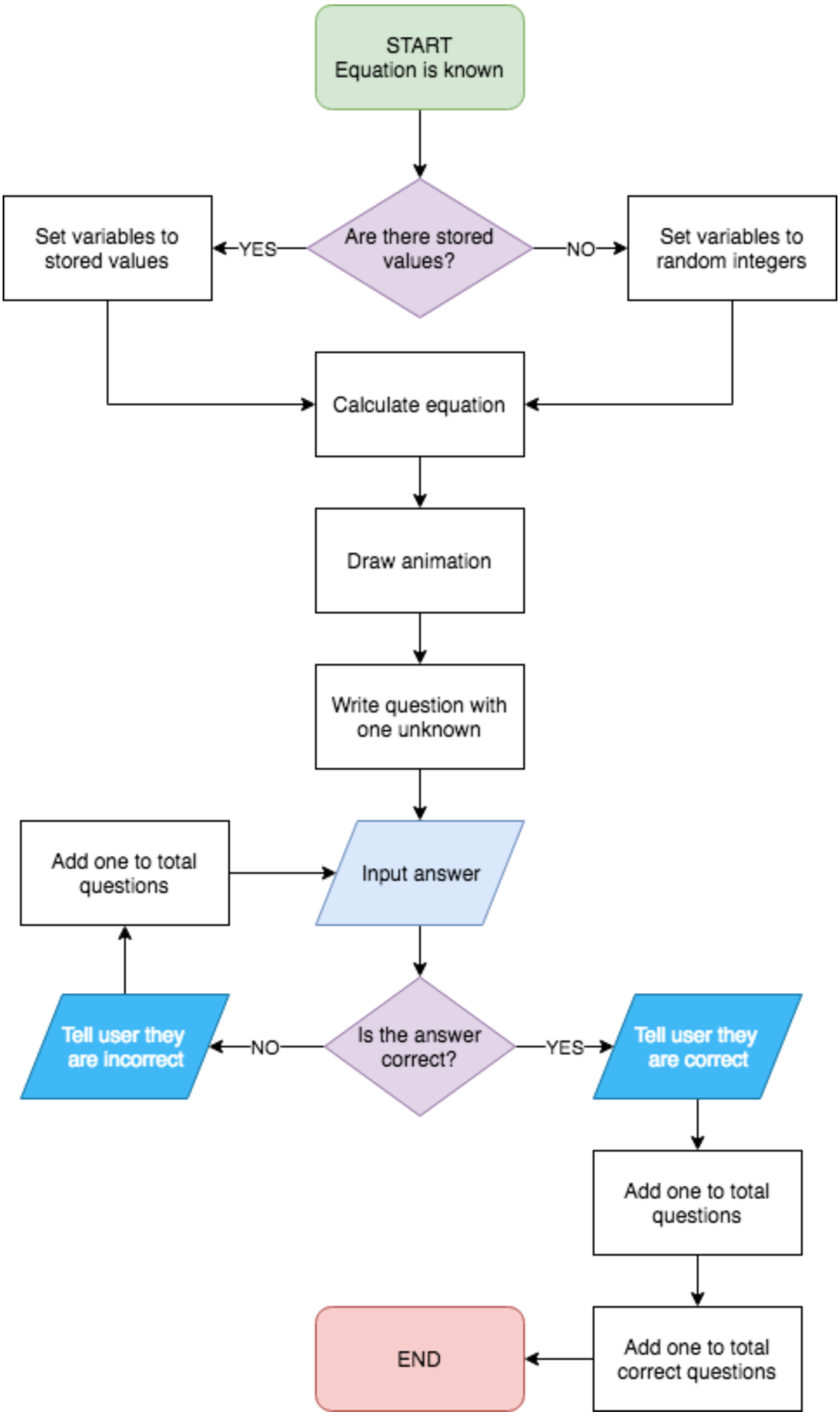
Flowchart - Main Algorithm



Flowchart - Demonstration Mode



Flowchart - Question Mode



User Interface - Webpage for Demonstrations and Questions (next two pages)

https://nwager.github.io/circularmotion

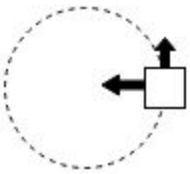
SL Physics 1-2 Circular Motion

Demonstration | Questions

Simulation 1

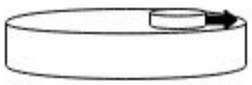
Equation
x=2
y=3
z=2

Simulation 2



Equation
a=3
y=6
b=1

Simulation 3



Equation
a=2
z=4

https://nwager.github.io/circularmotion

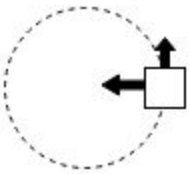
SL Physics 1-2 Circular Motion

Demonstration | Questions

Simulation 1

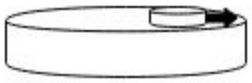
x=10
y=4
What is z?

Simulation 2



y=6
b=1
What is a?

Simulation 3



a=2
What is z?

Input
The user will type numbers into input fields both in demonstrations and questions. The text will be parsed as an integer.

Output
Simulations will be drawn and animated using canvasses in JavaScript.

Storage
Numbers will be saved as integers in localStorage in order to accomodate multiple browsers.

Test Plan

Test	**Action**	**Result**
Funtionality on different browsers	Perform the tests listed below on Chrome, Firefox, and Safari	Program passes tests on each browser
Usability	Let client and other students use the program	Users are able to find where to change modes and input numbers
Simulation updates based on values in demo mode	Type three different numbers into each question that are separated by four or more	Simulation correctly scales motion and size
Simulation correctly scales with values on question mode	Generate each question with three different values like the test above	Simulation correctly scales motion and size
Questions do not repeat	Generate each question with random variables twenty times	There no repeated integers unless the entire range has been used, in which case the cycle starts over
The correct answer is generated	Generate each question three times and solve on paper with double check, then type in answer	The program generates the correct answer
Feedback is given after submitting an answer to a question	Enter an incorrect answer and a correct answer into each question	The program tells the user whether they were correct or incorrect
Tracks correct answers and total questions	Enter 5 correct answers and five incorrect answers	The tracker should display “5/10 correct”
Program stores simulation values	In demo mode, enter numbers into each simulation and keep track of them, then close and reopen the page	The values are retained by the program

Program saves currect questions if requested	Keep track of current questions, check “save questions”, then close and reopen the page	The questions are retained by the program