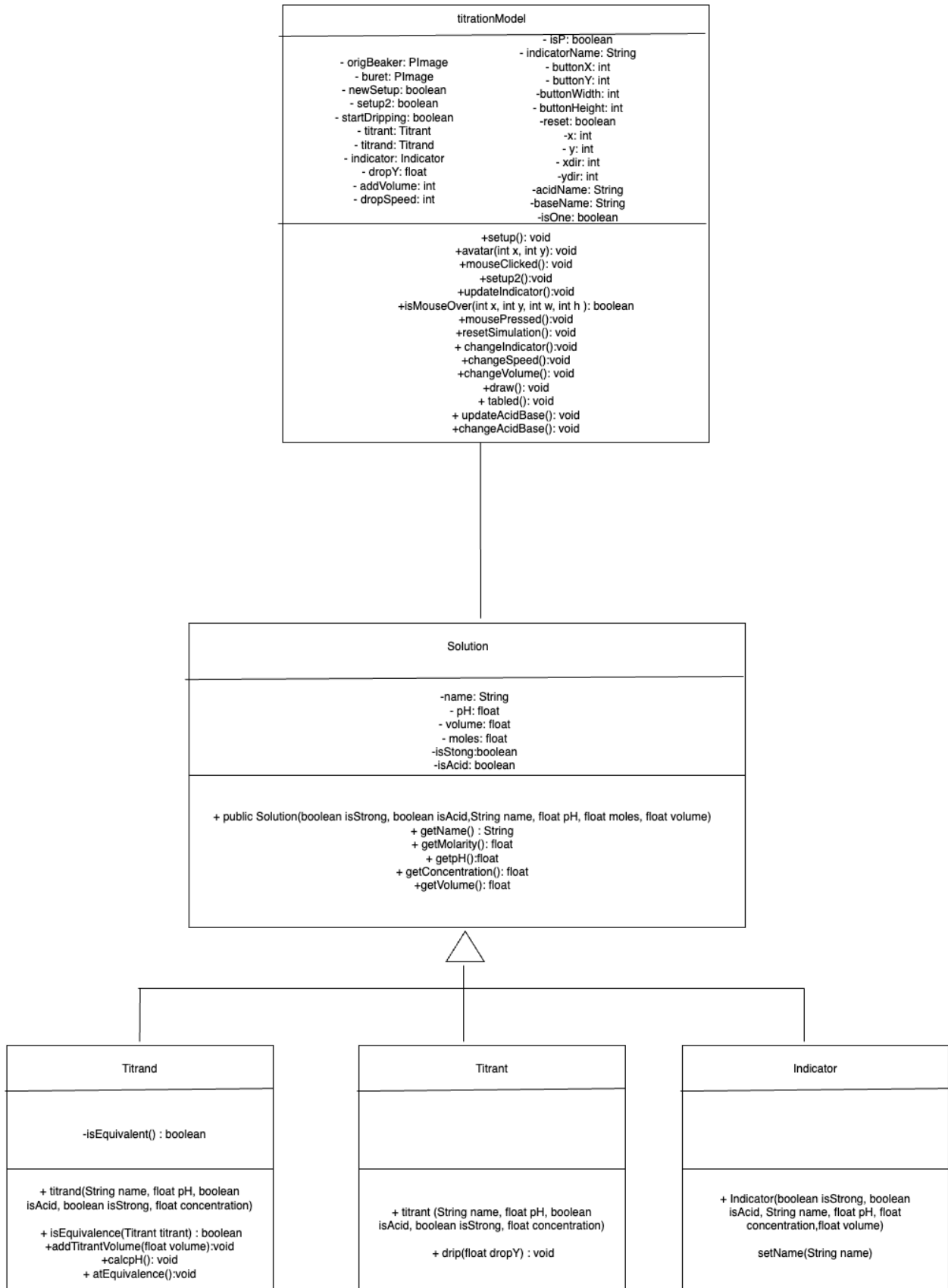1. Intro
   a. Period: 1
   b. Group Members: Catherine Wijaya , Amy Kuang
   c. Group Name: Former Chemists
   d. Project Title: Acid-Base Titration Model

2. Description
   a. This simulator of an acid base titration shows how adding solutions of acids/bases to a solution of unknown molarity can help you determine the concentration. It models how the color of the solution would change as one adds the acid or base because it would change the pH of the solution, which interacts with the indicator that changes color after the solution reaches the equivalence point. It will also demonstrate how using different acids and bases can reach the equivalence point at different rates and at different concentrations.
   b. In the simulation, there will be a table that displays the pH and the concentration of each solution. The data will change as the concentration of the titrant increases. We will include the buret and the beaker and we will animate the droplets going into the beaker at different rates according to the one you select. Once it reaches the equivalence point, it will turn a light color, but if you drip too much solution, it will become a much darker color.
   c. We will make different classes for the indicator, titrant, and the titrant so that you will be able to choose between the different kinds. Our simulation will include two strong acid-strong base titrations and a weak acid-weak base titration.

3. UML Diagram

titrationModel

- origBeaker: PImage
- buret: PImage
- newSetup: boolean
- setup2: boolean
- startDripping: boolean
- titrant: Titrant
- titrand: Titrand
- indicator: Indicator
- dropY: float
- addVolume: int
- dropSpeed: int
- isP: boolean
- indicatorName: String
- buttonX: int
- buttonY: int
- buttonWidth: int
- buttonHeight: int
- reset: boolean
- x: int
- y: int
- xdir: int
- ydir: int
- acidName: String
- baseName: String
- isOne: boolean

+setup(): void
+avatar(int x, int y): void
+mouseClicked(): void
+setup2():void
+updateIndicator():void
+isMouseOver(int x, int y, int w, int h): boolean
+mousePressed():void
+resetSimulation(): void
+ changeIndicator():void
+changeSpeed():void
+changeVolume(): void
+draw(): void
+ tabled(): void
+ updateAcidBase(): void
+changeAcidBase(): void

Solution

-name: String
- pH: float
- volume: float
- moles: float
-isStong:boolean
-isAcid: boolean

+ public Solution(boolean isStrong, boolean isAcid,String name, float pH, float moles, float volume)
+ getName() : String
+ getMolarity(): float
+ getpH():float
+ getConcentration(): float
+getVolume(): float

Titrand

-isEquivalent() : boolean

+ titrand(String name, float pH, boolean isAcid, boolean isStrong, float concentration)

+ isEquivalence(Titrant titrant) : boolean
+addTitrantVolume(float volume):void
+calcpH(): void
+ atEquivalence():void

Titrant

+ titrant (String name, float pH, boolean isAcid, boolean isStrong, float concentration)

+ drip(float dropY) : void

Indicator

+ Indicator(boolean isStrong, boolean isAcid, String name, float pH, float concentration,float volume)

setName(String name)

4. How does it work?
    a. We will have a starting screen where if you click the screen with the mouse, it will take you to another screen that starts the simulation. Also, if you wait too long, then it will automatically go to the next screen.
    b. The next scene will be where you can choose the specific experiment combination of acids and base, and we will animate the pouring of the indicator and the titrand to a beaker. Next, you will see a buret and the beaker. You will be able to select how you want the titrant to drip down into the beaker: how fast or slow it goes. Here, you will also see a table of the pH, how many milliliters of titrant and titrand there is. As the titrant is dripping, you will also be able to see the color of the solution in the beaker changing. The objective is to stop the dripping at the right time, when the solution turns another color and stays there. Then you will find the equivalence point.
    c. To start animating the dripping, press enter.

5. Functionalities / Issues
    a. The buret and the beaker on the main page are shown
    b. All the constructors are implemented, as well as the isEquivalent(Titrant titrant) in the titrand class
        i. Checks if a Strong acid and Strong base is at equivalence point
    c. The drip method that animates the titrant going into the beaker is functioning
    d. Once the solution inside the beaker hits equivalence point, the solution turns pink, or blue, based on what you choose
    e. We can display the table with all the calculations, as well as letting the user have more control over certain variables such as type of solution, drip rate, or indicator.
    f. The user can also change what kind of acid-base titration they want
    g. The user can change the indicator by clicking on the button, which will change the color of the solution once it hits past equivalence point
        i. The solution will only turn light pink/ blue at one point during the titration, and will turn into a darker shade once it's past equivalence
    h. The user can also update the drop speed and the volume that is added into the solution

6. Log

Catherine	- Implemented the drip method to animate the titrant dripping into the beaker - Created the equivalence method so that the liquid in the

	beaker would change color as the titrant drips down - Implemented the change volume, adjust speed, change indicator, reset simulation method
Amy	- Created start screen and the progress bar there to go to the next slide - Created the table to show the pH, concentration and other values as you add more titrant - Created a change acid/base method