**CS1pre-AP: GUI End of the Year Project**

**GUI Requirements**:

* Must use at least one JFrame and at least one JPanel
* Must use a JMenuBar, with at least one JMenu, and at least two JMenuItems
* Must use at least two Java Swing Components, including but not limited to:
  + JLabel, JButton, JToggleButton, JRadioButton, JTextField, JTextArea, JComboBox, JScrollBar, JSlider,…
* Must use at least one JOptionPane dialog box (with or without user input)
* Must use at least one type of functional “listener” (ActionListener, KeyListener, MouseListener) and execute code when certain events are triggered.

**Ideas**

Games:

* There must be a way to win, and specific rules.
* Quiz games / Trivia games
* Games with Sprites / key movement
* Suggestion: “Score” or “High Score” can be kept track of with an int variable

Two-player games:

* One player can use the mouse, one can use the keyboard,

Educational Programs: Programs designed to help the user learn and/or help with conversion or calculations

Science

* Biology: Write a program which will have student input DNA (“ACTG”) – translate to matching RNA
* Physics: Have your user input values like initial velocity, mass, etc. and calculate out the result of a physics problem.
* Chemistry: Write a program to balance a chemical equation?

Mathematics:

* Write a program which has the user enter in Have user enter in a set of numbers. Output the statistical data (mean, median, range, mode, variance, standard deviation, 5-number summary)
* …
* Write a math-based game
* An equation-solver

Medicine:

* Have the user input information about their height and weight, and calculate their BMI (Body-Mass Index)

Others: translators, chatbots, image/sound manipulation, paint program, coding/decoding (Strings),