

Title: Quadratic Graphing Machine

Target group: High School CS112 dual enrollment class

Objectives of the assignment:

Students will create a program to graph quadratic equations input by a user.

Unit description:

This project tasks students to create a program that will prompt users to enter a quadratic equation in graphing form or standard form. Then graph the equation in the xy-plane on a user set window size. After graphing the equation, the program will prompt users if they want to graph another equation.

- (10 pts) The program must draw the x and y axis with their origin at the center of the stage.
- (10 pts) The program must draw in minor axis in the x and y direction. In other words, a grid for the 2D space.
- (10 pts) The program must allow the user to set the maximum and minimum x values graphed. i.e. change the x- size of the graphing window.
- (50 pts) The program must use a procedure for graphing, one for initialization, one for drawing the axis, one for dealing with the form of the quadratic entered.
- (5 pts) The program must show the coefficients of the function being graphed.
- (5 pts) The program must poll a button to determine whether to graph another equation.
- (10 pts) The program must make sure the user does not enter invalid choices to questions asked.
- (10 pts) Add comments to each section.

Prerequisite material:

The unit assumes students are familiar with the following palates.

Pen	Motion
Events	Looks
Conditional	Data
More Blocks	Sensing
Operations	

This project is a good summative assessment after the unit on drawing flowers and such.

Reflection questions:

- What methodology did you use to scale the x-axis?
- Did you transfer any data into or from the procedures that you created? If so, what information and why?
- How did you determine the minor axis positions?
- How did you handle the difference between the two forms of a quadratic when it came time to graph them?

Idaho Computer Science Standards Addressed

9-10.AP.11 Illustrate how mathematical and statistical functions, sets, and logic are used in computation. (Grades 9-10)

11-12.AP.07 Critically examine algorithms and design an original algorithm (e.g. adapt, remix, improve). (Grades 11-12)

11-12.AP.08 Evaluate efficiency, correctness, and clarity of algorithms. (Grades 11-12)

11-12.AP.10 Decompose a problem by creating functions and classes. (Grades 11-12)