Name(s)	**Project Number**
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Project Title

Graphical: Graphing Calculator App for the iPhone

Abstract

Objectives/Goals
Design and develop an intuitive, function-based graphing calculator app for iOS.

Methods/Materials
I planned the app's features, then sketched and drew wireframes for each screen in a sketchbook. The user interface of each screen was then designed in more detail. Next I created charts for object communication using the MVC paradigm on a whiteboard. I then set up the basic structure of the app in Xcode on a MacBook Pro running OS X Mountain Lion 10.8, and coded the simple functionality of each of the planned screens (basic equation editor, graph view, and table view) using the iOS SDK and Core Graphics. Each screen was revisited as I added more features, improved, and refined while testing along the way. The app was tested on an iPhone 4S running iOS 6.1 and finalized by fixing bugs.

Results
I succeeded in developing the graphing calculator app which accurately displays the graph of any function the user enters with fluid gesture support, custom UI, and the ability to analyze graphs.

Conclusions/Discussion
The process of iteration and testing is critical in software development to create a polished product. For instance, at first the graph view recalculated all the values of the function visible on screen for every change of the origin as the user panned around. While this ran smoothly on the iPhone Simulator backed by a computer processor, testing on the actual iPhone hardware revealed that this yielded terrible performance. To solve the issue, I had to implement a cache to keep the previously calculated values and use them while panning, triggering a refresh of the values once the user stops panning. I was able to overcome complex problems and challenges by breaking them down into smaller steps.

Summary Statement

Using my knowledge of the iOS SDK along with Apple's docs, I created a graphing utility for the iPhone that will aid myself and other students once it arrives on the App Store.

Help Received

The project was completed entirely by myself.