



## **App Inventor Extension for Flowcharts/Pseudocode for SNAP** **– J. Warfel, D. Wilson**

### **Purpose**

In the previous lesson (SNAP Logic, or Flowcharts/Pseudocode for SNAP) students described the algorithmic structures behind SNAP eligibility and benefit calculation. In this lesson, they use MIT App Inventor to create an Android app built on those algorithms.

### **Overview**

Students create an app that determines whether a household is eligible to receive SNAP benefits, then calculates the monthly benefits that the household would receive under the rules of a given state.

### **Student Outcomes**

General AP Computer Science A goals targeted:

- Students should be able to code fluently in an object-oriented paradigm [using the programming language Java]. (Note that, although App Inventor is built on Java and uses Java-like structures, it is not a substitute for teaching Java in a standard compiler such as Eclipse.)
- Students should be able to read and understand a large program consisting of several classes and interacting objects.
- Students should be able to recognize the ethical and social implications of computer use.

### **Time**

After students are familiar with App Inventor, they should be able to make the app for Problem 1 in a single class period (about an hour). The app for Problems 2 and 3 (the calculation of net income and, from that, the benefit amount) is much more difficult and could take several hours.

### **Level**

AP Computer Science

### **Materials and Tools**

Students need good internet access in order to use App Inventor successfully.

### **Preparation**

Students should already be somewhat familiar with App Inventor.



## Prerequisites

Students must have completed the initial lesson about SNAP (“Flowcharts/Pseudocode with SNAP”, or “SNAP Logic”) already and should have their answers available while working on this lesson. They should also have completed several activities from the App Inventor text (available for free online at <http://www.appinventor.org/projects>). The app for Problem 1 (determining whether or not a household is eligible to receive SNAP benefits) requires only basic knowledge of App Inventor. The app for the entire SNAP system (which includes calculating the SNAP benefits, addressed in Problems 2 and 3) requires more extensive knowledge of App Inventor, especially if the student chooses to implement it as a multiscreen app.

## Background for students

As demonstrated in the “Flowcharts/Pseudocode with SNAP” lesson, the application and benefit calculation process for SNAP is complex and potentially cumbersome. In this lesson, you will create an app that allows people to calculate the benefit they would receive from SNAP. In doing so, you are creating a tool that makes people aware of the information they need to gather in order to apply for SNAP, and which helps them decide, given the benefits they will receive, whether it is worth the effort to apply.

## Teaching Notes

You may choose to have students only to do the app for Problem 1 (determining eligibility), or the app for Problems 1-3 (the entire SNAP benefit calculation process). This is intended to be an open-ended, independent assignment. Encourage the students to use the internet to find the answers to their questions about App Inventor (just as they should use the Java documentation to answer their questions about Java). Many people are using App Inventor, and for nearly any question students are likely to have, there is an answer (if not a tutorial on YouTube) to answer it. If they cannot find an answer through search, they can post a question in the App Inventor forums.

We suggest creating an app for Massachusetts because that state provides a succinct, but complete, explanation of the SNAP benefit process. However, a motivated student could find the documentation for any state. The contiguous 48 states primarily differ in the manner in which the housing deduction is calculated, and all have different SUA values. Alaska, Hawaii, and Guam have different eligibility standards, as well as higher maximum benefits.

Note: The App Inventor emulator cannot emulate multiscreen apps, or apps that use TinyDB objects. If students choose to use either of these, they should use a physical Android device and the “Download to Connected Phone” option to test their app.

## Assessment

We suggest having the students test one another’s apps.

We have provided the App Inventor source and \*.apk files for an app of Problem 1 only ([SNAP 1a.zip](#) and [SNAP 1a.apk](#)) and for Problems 1-3 using the benefit calculation standards of Massachusetts ([SNAP Massachusetts.zip](#) and [SNAP Massachusetts.apk](#)).