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| Coin Flip is an app that simulates the flipping of a two-sided coin. This app uses App Inventor’s random number generator and two images to simulate the coin flip.  **Objectives:** In this lesson you will learn to:   * add additional features to an existing mobile app; * modify some of the code of an existing app; * improve coding skills by solving simple and challenging programming problems; * use *Math* random number blocks to generate a random value. | ***[Click the image to watch video](http://www.youtube.com/watch?v=4b4bE2y8NJ8)*** |

# Getting Ready

Open [App Inventor with the Coin Flip Projects template](http://ai2.appinventor.mit.edu/?repo=templates.appinventor.mit.edu/trincoll/csp/unit4/templates/CoinFlipProjects/CoinFlipProjects.asc). This will open the project that we completed in the Coin Flip Tutorials. Or, if you already have App Inventor open, you can use your project from the Coin Flip Tutorial. Use the *Save As*  option to rename your project to *CoinFlipV2* or something to indicate that it is version 2 of that app*.*

If using the template linke, be patient. It sometimes takes a moment to retrieve and open the project.

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# Coin Flip Mini Projects

## Mini Projects

Here are some creative projects. Choose the ones that appeal to you. Use the ***Save As*** button to rename your project to “CoinFlipProject#” [where # will be replaced by the mini project number you will complete from the list of mini projects below.]

1. Modify your app so that the user can also shake the phone to flip the coin. (HINT: Use the

[Accelerometer Sensor](http://ai2.appinventor.mit.edu/reference/components/sensors.html#AccelerometerSensor).) NOTE: Instead of copying and pasting the coin-flip algorithm, you'll want to use a ***procedure*** to reduce complexity in your code.

2. Modify your app so that “heads” or “tails” is spoken when the coin is flipped. (HINT: Use the [TextToSpeech](http://ai2.appinventor.mit.edu/reference/components/media.html#TextToSpeech) component.)

3. Modify the event handler in the Coin Flip app to use random fraction instead of random integer. (HINT: App Inventor’s ***random fraction* *block*** returns a a decimal number between 0 and 1, not including 1. Some examples: 0, 0.25, 0.33, 0.5, 0.66, 0,75, 0.99.)

4. **If/else Algorithm:** You now have an app that can flip a two-sided coin. Modify your app that so that it can flip [a three-sided coin](https://home.comcast.net/~davejanelle/coin3.htm). (Hint: You will need an if/else block with three conditions. Also, it might be better to use the *random integer block* for this problem. You’ll need a third image for this problem; here’s one that is openly licensed: [coin on edge](http://uncyclopedia.wikia.com/wiki/File:Coin-edge.gif).)

5. According to [this report](http://mathtourist.blogspot.com/2011/02/penny-bias.html), if you stand a bunch of Lincoln pennies on their edge and then bang the table, they have a strong bias toward coming up heads. Let’s suppose the coin has a 70% chance of coming up heads (30% tails) in this experiment. Create a model to simulate this biased coin. (HINT: Use *SaveAs* to create a new project for this problem.)

6. **Be Creative.** Come up with your own ideas to enhance your app.

***Nice work! Complete the Self-Check Exercises and Portfolio Reflection Questions as directed by your instructor.***