Finch How To:  
Programing the Finch in Java.

Import the Finch class:
import edu.cmu.ri.createlab.terk.robot.finch.Finch;

Instantiate the Finch object
Finch myFinch = new Finch();

Now create a circumstance in which your program will run as long as it is false. You make the circumstance true to end the program – something like (pseudocode)

    maze_complete = FALSE;
    while (not maze_complete)
        {
            .
            .
            .
            many things
            .
            .
            if (at endomaze) maze_complete = TRUE;
        }

Now write the code for how you want your Finch to act in order for it to complete the task. Look through the Java class in edu.cmu.ri.createlab.terk.robot.finch.Finch on the website http://www.finchrobot.com/javadoc/index.html to see some of the commands you can use for the Finch.
Finch's hardware that can be used when you write your program:

The Accelerometer can report changes in acceleration in three dimensions.

The Obstacle Detection System reports whether an obstacle is present (within 3-12 inches), but nothing more.

The Light Sensors are sensitive enough to allow a Finch's program to track a light source.

The temperature sensor can detect changes in temperature. Not so exciting there, sorry.

The multi-color LED can be used to communicate 'mood', or other status. The Finch can also emit multi-frequency sounds.

The motor-wheels can be independently controlled for direction and speed.

The USB cable is used for communication and power.
CODING

Here is an example section of code from a finch program would look in Java (the device can be programmed in many languages, including Java, Python, C, Matlab, LabView, and Snap):

```java
(myFinch.isObjectLeft()) {
    myFinch.setWheelVelocities(200,255,4000);
    myFinch.setLED(255,0,0);
    myFinch.setBuzz(255,4000);
}
```

So the first thing this code does is it sets up the Finch's obstacle sensors to see if there is an obstacle to the left. If this is true the Finch will then do three things:

1. It will set the speed of the wheels so that the left wheel is 200, the right is 255 (the Finch will turn to the left because the right is moving faster than the left) and it will do this for 4000 milliseconds.

2. The Finch will set the LED to red (the values of this command from left to right read red, green, blue)

3. The Finch will set its buzzer to a frequency of 255 for 4000 milliseconds.

The whole list of operators and commands can be found in the Finch Javadocs at: 
[http://www.finchrobot.com/javadoc/index.html](http://www.finchrobot.com/javadoc/index.html) One challenge you could look into while coding is using the Finch's light sensors to seek out the other Finch in the contest. We will have lights on top of each Finch in order for your program to find the other Finch, but it will be difficult for you to do this because the Finch's light sensor can be somewhat inconsistent.

Always end your program with

```java
myFinch.quit();
System.exit(0);
```

Have fun! See [http://www.finchrobot.com](http://www.finchrobot.com) for many more examples and ideas.

(For the “Finches of Death” contest: Remember that your Finch must run into the other Finch for at least 3 seconds, you should use the buzz command to get the referee's attention while your Finch is making contact, and its beak must turn red for the duration of that time. (The Finch has very good sensors made for detecting obstacles around it.)