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Session 2 Resources

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Session 2 Resources
CREATING CLASSIFIERS - PART 1A

Please use the Kadenze version of Wekinator to complete this assignment (http://wekinator.org/kadenze/), and ensure you are using the latest version of the Kadenze Wekinator (version 2.1.0.6 or higher).

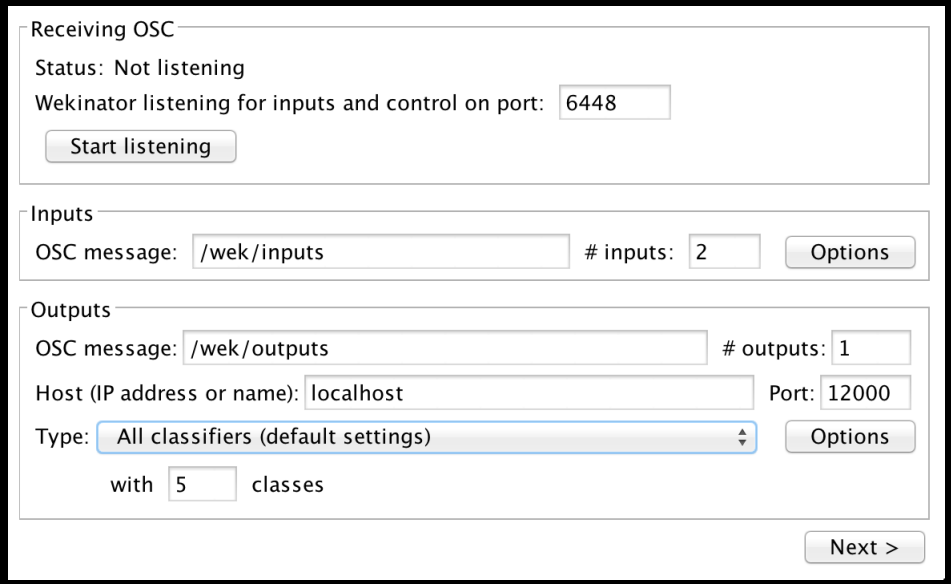
When you're working on this assignment, be sure to choose the correct section (e.g., "Assignment 2: Part 1A") from the drop-down menu when you start Wekinator. You don't have to complete this assignment in one sitting, or within the same Wekinator project!

Important: Ensure you only have one Wekinator project open at a time when you are doing an assignment! Otherwise our graders may get confused.

a. Open Wekinator, and choose "Assignment 2, Part 1A" from the Kadenze options

b. Run the Classifier Explorer program (from the Wekinator Kadenze website above), which will allow you to use your mouse to create training and test examples, and to draw decision boundaries on screen (just like you saw in lecture).

c. Remember that you'll need to run Wekinator with 2 inputs and 1 classifier output (with at least 3 classes), to work with this program. Your Wekinator setup screen should look like this:



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CREATING CLASSIFIERS - PART 1A

Part 1A, Continued

d. After you've set up Wekinator using the screen above, you can minimize Wekinator and only use the Classifier Explorer program. The Classifier Explorer interface allows you to train, clear training examples, add test examples, draw decision boundaries, and clear the test examples. You'll only want to go back to Wekinator's interface to change the algorithm type for your model. (Take a look at the video tutorial for the Classifier Explorer at http://www.wekinator.org/videos/ if you're not clear how to do this.)

e. Take some time to experiment with making classifiers and drawing their decision boundaries on screen. Experiment with at least two different classification algorithms and at least two different training sets. (We won't grade you on how "well" you do this part, but only on whether or not you do it.)

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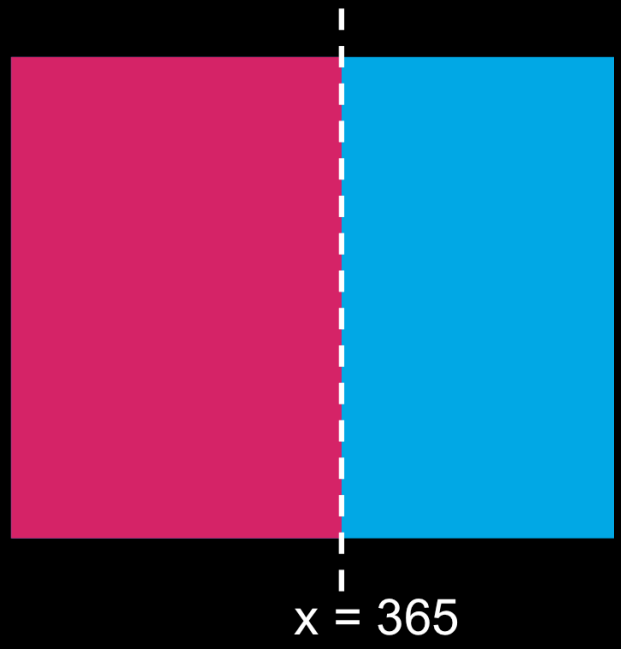
CREATING CLASSIFIERS - PART 1B

a. Once you feel comfortable with the Classifier Explorer, select “Assignment 2, Part 1B” in the Kadenze menu.

b. Select “k-Nearest Neighbor” as your model type, using k=1. Delete all existing training examples.

c. Now try to choose a set of training examples that will draw the boundary on screen, with Class 1 on the left in red and Class 2 on the right in blue.
(See Diagram to right)

d. Keep improving your boundary by changing your training examples, re-training, and re-drawing the decision boundary until you are happy with how it looks. (You’ll be graded on how closely your last model in this part of the assignment matches the decision boundary above, with an understanding that it may not be perfect!)



Part 1B classifier: Notice that this decision boundary is exactly in the middle of the rectangle. If you were to hover over this line with your mouse, and look at the “Current position” displayed at the bottom left of the Classifier Explorer, you would see that the x-coordinate of your current position would be 365.

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CREATING CLASSIFIERS - PART 1C

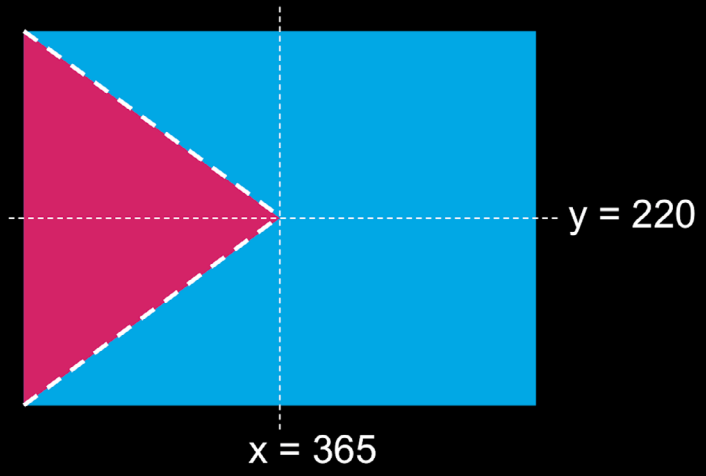
a. Select “Assignment 2, Part 1C” in the Kadenze menu.

b.Delete all existing training examples if you have a project open already.

c. Keep “k-Nearest Neighbor” as your model type, and continue using k=1.

d. Now try to find a set of training examples that will draw the following boundary on screen, with Class 1 in red and Class 2 in blue.
(See Diagram to Right)

e. Keep improving your boundary by changing your training examples and re-training, until you are reasonably happy with how it looks. (You’ll be graded on how closely you match the decision boundary above, with an understanding that it may not be perfect!)



Part 1C classifier: Notice that this triangle comes halfway out into the rectangle. The right tip of the triangle sits at position (365, 220).

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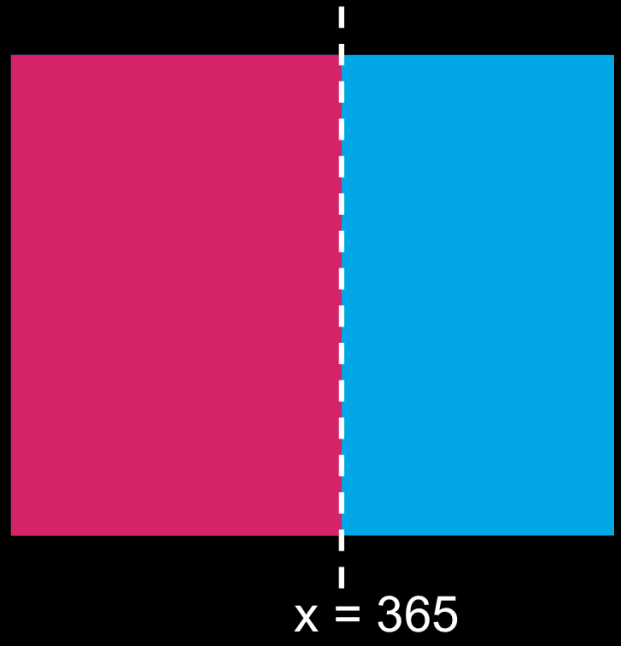
CREATING CLASSIFIERS - PART 1D

a. Select “Assignment 2, Part 1D” in the Kadenze menu.

b. Delete all existing training examples if you’re starting with an existing project.

c. Choose “Decision stump” as your model type, and try to find a set of training examples to give you the following decision boundary, with Class 1 on the left in red and Class 2 on the right in blue. (See diagram to Right)

d. As before, keep editing your training examples until you like the boundary.



Part 1D classifier: Notice again that this decision boundary is exactly halfway through the rectangle, at x = 365.

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Session 2 Resources
CREATING CLASSIFIERS - PART 2

a. Close the Classifier Explorer program and any existing Wekinator projects, if they're open.

b. Choose "Assignment 2, Part 2" from the Kadenze menu.

c. Now take some time to explore making classifiers with one or more of the more interesting input and output examples that come with Wekinator. Try to find at least one combination of an input, an output, and a classification algorithm that allows you to control a sound or animation in an interesting way.

d. Also, try to find at least one combination of an input and a classification algorithm that allows you to control an output in an accurate, predictable way (this may or may not be the same thing as being "interesting," but you'll need this for Part 2B!) You might try using some of the webcam or audio inputs for this.

At minimum, you should train and run at least 5 classifiers in this section.

e. Once you've got an idea of how to build an accurate, predictable classifier, move on to Part 3.

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CREATING CLASSIFIERS - PART 3A

a. Choose “Assignment 2: Part 3A” from the Kadenze menu.

b. Create a new Wekinator project that will allow you to build an accurately controllable classifier, using an input and classification algorithm of your choosing. Your project should only contain 1 model, and it should be a classifier with 3 output classes.

Don’t start with a previous project or pre-existing training set! This section requires you to demonstrate that you can train this classifier from scratch.

c. For your output, run the “Simple classifier control of color and sound” from the Wekinator example bundle. This program will change its color and sound according to your model’s class. (You can run this either as a Processing sketch, or run the executable for your operating system.)

d. Build yourself a 3-class classifier that you can accurately control. Keep changing the training data and/or algorithm until you are confident that you can consistently control your classifier to produce all 3 output values.

In part 3B, you’ll be graded on how accurately you can control this classifier. In order to receive full credit, you’ll need to demonstrate that you can move through the class sequence “1, 2, 3, 1” with at least 90% accuracy and a reasonable degree of human timing accuracy.

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CREATING CLASSIFIERS - PART 3B

a. Once you are happy with your classifier in Part 3A, select "Assignment 2, Part 3B" from the Kadenze menu.

b. Use the classifier you created in Part 3A and perform the following demo to show us that your classifier works:

- Put Wekinator into "Run" mode, and immediately start demonstrating Class 1 for 2 seconds
- Demonstrate Class 2 for 2 seconds
- Demonstrate Class 3 for 2 seconds
- Demonstrate Class 1 for 2 seconds
- Immediately stop running.

Important: You will be graded on the accuracy of your demonstration, so we recommend you use a stopwatch to time this precisely. Your total run time (as shown on the bottom of Wekinator's screen when you stop running) should be around 8 seconds. In order to receive credit, please ensure the run time is between 5 and 13 seconds.

c. If you make a mistake, you can re-try this as many times as you need to without penalty, as we'll only grade you on your final attempt.

d. To submit Parts 1–3, select "Create Kadenze Assignment 2 Submission..." from the Kadenze menu in Wekinator. This will create a .zip of your classifier creation logs. Upload that .zip as your submission for Parts 1–3.

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Session 2 Resources
CREATING CLASSIFIERS - PART 4

Written Component

Write at least one post (minimum 50 words) to the forum "Creating Classifiers", which can be:

- A question you have about classification (or more than one question!)
- Answering someone else's question(s)
  and/or
- Sharing your insight about how you were able to create an accurate classifier, in a way that will be helpful for other students trying to do the same thing.

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