Reading & Discussion: Chapter 5 - Machine Learning (SVMs Pages 405-420)

TASK

Your task for this discussion is to read [Chapter 5 - Machine Learning (SVMs Pages 405-420)Links to an external site.](https://jakevdp.github.io/PythonDataScienceHandbook/05.07-support-vector-machines.html). This can be found in the link provided or the [pdf version of the textbook](https://elearning.mines.edu/courses/52392/files/5459013/download?wrap=1)[Download pdf version of the textbook](https://elearning.mines.edu/courses/52392/files/5459013/download?download_frd=1)for the class that we have provided. You will then post a discussion and a reply below!

DISCUSSION REQUIREMENTS

Once you have completed this weeks reading, you are asked to complete the following tasks:

1. Post a 1-2 sentence response from the reading for 2 of the three below prompts:

a. Why is it useful to maximize the margin in an SVM?

b. What part of an SVM make up the support vectors?

c. Provide a free-response: this can be anything from clarification questions, something that piqued your interest, or maybe a personal experience you have with what was discussed in the book section.

2. Post a meaningful reply to another student's question/post.

Our goal is to help you get a deeper understanding of data science and discussions are a wonderful way to do this! Think of this as a learning opportunity for both you, your classmates, and your professor! Be sure to use academic language and question ideas from the readings for clarity or to push your own thinking.  You may of course respond to more than two of the questions and more of your classmates if you would like.

# **Instructional Videos & Learning Materials: Classification**

## WATCH

Watch this week's videos, download the working files so you can follow along and experiment with the platform we'll be using for the course.

**Classification via kNN Video**

**Classification via LogReg Video**

**Classification via SVM Video**

WORKING FILES

You will need the following files to get set up for this week. They include the following:

* Jupyterhub notebooks (download to a personal device then upload to your Jupyterhub). Also, download the images and place them in the same directory in your Jupyterhub notebooks.
  + KNN
    - [Classification via KNN Jupyter Notebook](https://elearning.mines.edu/courses/52392/files/5459044/download?wrap=1)[Download Classification via KNN Jupyter Notebook](https://elearning.mines.edu/courses/52392/files/5459044/download?download_frd=1)
    - [Supporting Image](https://elearning.mines.edu/courses/52392/files/5459043/download?wrap=1)[Download Supporting Image](https://elearning.mines.edu/courses/52392/files/5459043/download?download_frd=1)
  + Logistic Regression
    - [Classification via Log Reg Jupyter Notebook](https://elearning.mines.edu/courses/52392/files/5459173/download?wrap=1)[Download Classification via Log Reg Jupyter Notebook](https://elearning.mines.edu/courses/52392/files/5459173/download?download_frd=1)
    - [Supporting Image](https://elearning.mines.edu/courses/52392/files/5459112/download?wrap=1)[Download Supporting Image](https://elearning.mines.edu/courses/52392/files/5459112/download?download_frd=1)
  + Support Vector Machines
    - [Classification via SVM Jupyter Notebook](https://elearning.mines.edu/courses/52392/files/5459171/download?wrap=1)[Download Classification via SVM Jupyter Notebook](https://elearning.mines.edu/courses/52392/files/5459171/download?download_frd=1)
    - [Supporting Image](https://elearning.mines.edu/courses/52392/files/5459059/download?wrap=1)[Download Supporting Image](https://elearning.mines.edu/courses/52392/files/5459059/download?download_frd=1)
  + PDF files that contain the same information as the Jupyterhub notebooks, in case your Juypterhub is not yet working.
    - [Classification via KNN PDF](https://elearning.mines.edu/courses/52392/files/5459249/download?wrap=1)[Download Classification via KNN PDF](https://elearning.mines.edu/courses/52392/files/5459249/download?download_frd=1)
    - [Classification via Log Reg PDF](https://elearning.mines.edu/courses/52392/files/5459131/download?wrap=1)[Download Classification via Log Reg PDF](https://elearning.mines.edu/courses/52392/files/5459131/download?download_frd=1)
    - [Classification via SVM PDF](https://elearning.mines.edu/courses/52392/files/5459020/download?wrap=1)[Download Classification via SVM PDF](https://elearning.mines.edu/courses/52392/files/5459020/download?download_frd=1)

ADDITIONAL RESOURCES

The links below are supplementary resources to help you review or strengthen the topics we have discussed:

* [K - Nearest NeighborLinks to an external site.](https://www.analyticssteps.com/blogs/how-does-k-nearest-neighbor-works-machine-learning-classification-problem)
* [Logistic RegressionLinks to an external site.](https://machinelearningmastery.com/logistic-regression-for-machine-learning/)
* [SVMLinks to an external site.](https://www.freecodecamp.org/news/svm-machine-learning-tutorial-what-is-the-support-vector-machine-algorithm-explained-with-code-examples/)
* [Choosing the Right EstimatorLinks to an external site.](https://scikit-learn.org/stable/tutorial/machine_learning_map/index.html)