This series of notebooks (generalPredictions) was created to combine all the steps of downscaling in one notebook. They import data, conduct a PCA, and reconstruct the data.

**generalPredictions:**

First attempt to downscale data in a single notebook. There are fewer functions and some extraneous code compared to later notebooks. Model is trained on 2007 data, used to downscale 2008 CANRCM.

**generalPredictions2:**

Version of generalPredictions with extraneous code removed. This notebook explored energy balancing by adjusting each eigenvector.

**generalPredictions3:**

Notebook with best run for reconstructing 2008 winds from 2007. This notebook has the best run on display - reconstructing with 65/65 components, and then multiplying up the reconstructed data by a constant so that it has the right amount of energy.

**generalPredictions3b:**

Duplicate of generalPredictions3, except it downscales 2007 winds instead of 2008.

**generalPredictions4:**

This notebook downscales the other data types (temperature, precipitation, humidity, shortwave/longwave radiation, etc.). Trained on 2007, downscales 2008.

**generalPredictions4b:**

Rough draft of generalPredictions4c (largely irrelevant).

**generalPredictions4c:**

Notebook for creating complete HRDPS files after downscaling, for every variable. Produces reconstructed daily HRDPS files and writes them to a given folder, for every variable explored in previous notebooks. Main notebook if you intend to create data files.

**generalPredictions4-solar:**

Duplicate of generalPredictions4, which looks at solar. Reconstructs 2007 solar from 2007 training data. Includes extra code to analyse mean of solar.

**generalPredictions4-solar2:**

Similar to previous notebook. It explores using an extra eigenvector to reconstruct solar, based on the predicted solar from latitude/time. This notebook reconstructs 2007 data after being trained on 2007 data.

**generalPredictions5:**

This notebook reconstructs the u and v winds for 2008 using 2007 data. The difference is that this notebook reconstructs the u and v winds separately rather than together (turns out that together is better).

**generalPredictions6:**

A notebook that averages the hourly data into 3-houly data in a different way. The angle remains the same, but the magnitude is the average of the magnitudes of the three days. This approach was shown to be better and was implemented retroactively in generalPredictions3 and notebooks that make files.

This next series of notebooks reconstructs HRDPS from daily CANRCM files, rather than 3-hourly.

**dailyPredictions1:**

Reconstructing wind data at 12 noon UTC from daily data. Reconstructs 2008 HRDPS at 12pm UTC after being trained on 2007 HRDPS (12pm UTC) and 2007 CANRCM (daily).

**dailyPredictions1b:**

Same as dailyPredictions1, except this notebook tries adding extra eigenvectors to help with fitting. Besides using the CANRCM eigenvectors, it also used those eigenvectors offset by a day. This approach was not found to be effective.

**dailyPredictions2:**

The previous notebooks reconstructed HRDPS for a particular time from daily CANRCM data. This notebook reconstructs each time, and then combines them to fully predict the 3-hourly winds from daily CANRCM.

**dailyPredictions3:**

Reconstructing 3-hourly data from daily data for variables besides winds. Basically dailyPredictions2 for all the other data types.

**dailyPredictions3-solar:**

Reconstructing 3-hourly data from daily data, specifically for solar. Adding another eigenvector to solar which uses latitude/day/time of year to predict solar intensity without cloud cover. Part of series of notebooks trying to fix the problems with solar.