Task 1:

1. Complete introductory Python course: <https://www.codeschool.com/courses/try-python>.
2. When completed, **save a screenshot of your completion badge and email it to me by midnight Sunday, 1/22.**
3. Watch this video: <https://www.youtube.com/watch?v=LvmpDyFyS7o>. Download newest version of Anaconda Python 3 onto your laptop: <https://www.continuum.io/downloads>. If you don’t feel comfortable installing software by yourself just send me an email and I can meet with you.
   1. Open your command prompt like in the video and type “python”. **Save a screenshot of the open program and email it to me by midnight Wednesday, 1/25.**
   2. If you are still in the Python console, type “exit()” to leave it. Now open your command prompt like in the video and type “ipython”. **Save a screenshot of the open program and email it to me by midnight Wednesday, 1/25.**
   3. If you are still in the Python console, type “exit()” to leave it. Now type “spyder”; **save a screenshot of the open program and email it to me by midnight Wednesday, 1/25.**
4. Complete Progress Report 1.

\*You may crop any of your images before you submit them, if you desire.

Task 2:

1. From playlist <https://www.youtube.com/watch?v=q6PP-C4udkA&index=10&list=PL7A750281106CD067&t=519s>:
   1. Watch videos 10 What is DNA?, 45 DNA Replication, 46 Translation and Transcription, 66 Mutations, 69 Proteins, 70 Nucleic Acids
2. From playlist: <https://www.youtube.com/watch?v=R6La6_kIr9g&list=PLFCE4D99C4124A27A>:
   1. Watch videos 32 Gene Regulation and 33 Signal Transmission and Gene Expression.
3. Go to <http://www.phschool.com/science/biology_place/biocoach/index.html>. Work through the modules “DNA Structure and Replication”, “From Gene to Protein: Transcription” and “From Gene to Protein: Translation.” Type a summary of each module. Make sure you write up a good description of the **central dogma of biology**.
4. Watch <https://www.youtube.com/watch?v=o5ZSKb3PtPM> to get a sense of different ways you can run Python.

Task 3

1. Go to: <https://github.com/cmwright12/QED-promoter_prediction>
   1. Click on the “Python” folder. Download the PowerPoint slides and view them.
2. Check in your Documents folder if you already have a folder with the name Python in it. If there is, it should be empty. If there isn’t, create a new folder named “PythonScripts”. Remember where this folder is.
3. Press the “Win + R” key to open RUN dialog box. Type cmd, and click/tap on OK. (The "Win" key is the one with the Windows logo. Alternatively, you can go to the "C:\Windows\System32" folder and find cmd.exe there.) I suggest saving it as a shortcut for easier access in the future. Type “jupyter notebook”. Navigate to “PythonScripts”.
4. Watch: <https://www.youtube.com/watch?v=qb7FT68tcA8>.
5. Run same/similar code. Assign some numeric variables and string variables. Define lists and print them using a for-loop.
   1. If you need a bit more step-through help with Python, see: [http://interactivepython.org/runestone/static/thinkcspy/index.html#](http://interactivepython.org/runestone/static/thinkcspy/index.html)
6. Save as notebook (.ipynb) and .html files and send them to me. You can follow the instructions here: <https://sites.google.com/a/jsums.edu/cwrightjsu/python/run-notebook>
7. Biology: Watch <https://www.youtube.com/watch?v=a9ZMTVlrLY0&list=PL9jo2wQj1WCNG9mFuNBmJ1m7x1skBNKw-&index=12>.
8. Machine Learning: Watch <https://www.youtube.com/watch?v=cKxRvEZd3Mw&list=PLOU2XLYxmsIIuiBfYad6rFYQU_jL2ryal&index=7>.

More Python learning resources:

* [http://interactivepython.org/runestone/static/thinkcspy/index.html#](http://interactivepython.org/runestone/static/thinkcspy/index.html)
* <http://openbookproject.net/thinkcs/python/english3e/>
* <https://people.duke.edu/~ccc14/sta-663/IntroductionToPythonSolutions.html>
* <https://www.tutorialspoint.com/python/>
* <https://realpython.com/learn/python-first-steps/#1-what-is-python>
* <http://hamelg.blogspot.com/2015/12/python-for-data-analysis-index.html>

Task 4

1. Data files can come in different formats. A popular format is the CSV file format, which separates data on each row by a comma. Watch videos on how to read CSV files into Python:

<https://www.youtube.com/watch?v=BpgbECVTryk>

<https://www.youtube.com/watch?v=sSRhhlZ6hPY>

<https://www.youtube.com/watch?v=Ps_NHjELVfg>

<https://www.youtube.com/watch?v=Uh2ebFW8OYM>

View this sample notebook: <https://github.com/cmwright12/QED-promoter_prediction/blob/master/Python/Notebook_Demos/FileObjects_Demo.ipynb>

1. Download the “fruits.txt” file from my Github account:
   1. The page will open in the browser. Right-click on the page, select “Save as…”, and save into your Python Scripts folder for future reference.
   2. Write code (in a notebook) that will only process the lines containing “grapes”. Save the numbers into one list called *quantity*.
2. Download the “backpacking.csv” file from my Github account: <https://raw.githubusercontent.com/cmwright12/QED-promoter_prediction/master/Python/backpacking.csv>
   1. The page will open in the browser. Right-click on the page, select “Save as…”, and save into your Python Scripts folder for future reference.
   2. Write code (in a notebook) that will, after looping through the file,
      1. Print how many items are in the dataset.
      2. List the unique categories.
      3. Create a list of the weights as you loop through the lines.
         1. Print the sum of the weights.
         2. Print the average of the weights.
   3. Preview one of the data files we will be using: <https://github.com/cmwright12/bioprojects/blob/master/QED-promoter_prediction/data/ecoli_k12_tss.txt>
3. Johnathan and Comelia: Watch the following videos on machine learning:

<https://www.youtube.com/watch?v=IpGxLWOIZy4>

<https://www.youtube.com/watch?v=elojMnjn4kk>

* 1. Summarize: What is machine learning? What are the two main categories? What are some examples? How does it work?

1. Shelbi and Alex: Read the following article <https://www.ncbi.nlm.nih.gov/books/NBK9850/>. Summarize the “RNA Polymerase and Transcription” section.