Wesleyan University, Spring 2022, COMP 343

Final Project

Full Project is Due by 5pm on May 11, 2022

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1. WHAT CAN YOUR PROJECT BE?

For your final project, you can choose from one of the options below. If you have another option in mind, please come talk to me. Your final project can also be either an individual or group projec. If you would like to work with more than 2 people, however, you need to convince me. Note that a group project requires more work to be done for the same grade.

Option 1: For a given dataset, compare performance of different algorithms with different hypothesis spaces. Organize your code for the different algorithms into modules/libraries for easy re-use.

Option 2: Learn about a more complex model in scikit or tensorflow and apply to data.

Option 3: Implement from scratch an algorithm not implemented in homework and apply to data. E.g., support vector machine, convolutional neural network, recurrent neural network.

Option 4: Do something more theoretical: e.g., work through understanding the theory more deeply for an algorithm (e.g., perceptron proof of number mistakes needed to converge, or neural network universal approximation theorem).

2. WHAT SHOULD YOUR FINAL PROJECT SUBMISSION INCLUDE?

Your should submit your code implementing any algorithms, a readme explaining how to run your code, any datasets, and a project report for your final project. Your project report should be 5-6 pages and submitted as a pdf. Include the following information in your project report.

- What problem did you work on?
- Why is problem interesting/important/relevant?
- What are the important ideas you explored?
- What ideas from class did you use?
- What did you learn?
- What is your algorithmic approach?
- Why does your algorithmic approach make sense for addressing your problem?
- What do your results show? How effective is your proposed approach?
- If you had more time, what would be future work for project?

All work should be submitted to the Google Drive directory I have created for you named `comp343-s22-USERNAME/project/`. You should replace `USERNAME` with your Wesleyan username.

3. Project Timeline

While the final project is due May 11, there will be the following intermediate check points to help you out.

April 20: Project proposal due by 5p. This is a (at least) 1-page writeup describing the problem you are interested in addressing and the proposed approach you are taking. This should be submitted as a pdf document named `proposal.pdf`.

April 27: Checkpoint 1 of code. Make a subdirectory in your project directory called `checkpoint1`. Include in that directory your initial code skeleton. You can either make comments in your code or in a separate pdf (`checkpoint1.pdf`) describing any issues you may be running into. Important: you should meet with either me or one of the CAs to discuss and sign off on the current state of your project.

May 4: Checkpoint 2 of code. Make a subdirectory in your project directory called `checkpoint2`. Include in that directory the current state of your code. Include a separate pdf (`checkpoint2.pdf`) sketching out your final report. Important: you should meet with either me or one of the CAs to discuss and sign off on the current state of your project.

May 11: Project code, data, and final report submitted. Make a subdirectory in your project directory called `final`. Submit your code and your final report (`final.pdf`).

4. How will your project be graded?

The final project is worth 20% of your grade in this class. Your grade will be computed as follows.

Project proposal (2.5% of grade).
- **Clear and coherent proposal.**
  A+(2.5%), A (2.25%), B(2%), C(1.75%), D(1.5%)

Checkpoint 1 (2.5% of grade).
- **Some progress on turning proposal into code.**
  A+(2.5%), A (2.25%), B(2%), C(1.75%), D(1.5%)

Checkpoint 2 (5% of grade).
- **Clear progress on turning proposal into code.**
  A+(5%), A (4.5%), B(4%), C(3.5%), D(3%)

Final Project Code and Report (10% of grade).
- **Difficulty of project (1% of grade)**
  A+(1%), A (0.9%), B(0.8%), C(0.7%), D(0.6%)

- **Code correctness of implemented algorithm** (2% of grade)]
  A+(2%), A (1.8%), B(1.6%), C(1.4%), D(1.2%)

- **Effective evaluation of algorithm performance** (1% of grade)
  A+(1%), A (0.9%), B(0.8%), C(0.7%), D(0.6%)

- **Code organization (2% of grade)**
  A+(2%), A (1.8%), B(1.6%), C(1.4%), D(1.2%)

- **Readme is included (1% of grade)**
  A+(1%), A (0.9%), B(0.8%), C(0.7%), D(0.6%)

- **Clarity and organization of project write-up (2% of grade)**
  A+(2%), A (1.8%), B(1.6%), C(1.4%), D(1.2%)

- **Report includes all componetns in Section 2 (1% of grade)**
  A+(1%), A (0.9%), B(0.8%), C(0.7%), D(0.6%)