

CPSC 330 Lecture 23: Deployment and conclusion

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Ethics Class

- See separate slides!

Course evaluations (~10 mins)

https://canvas.ubc.ca/courses/165412/external_tools/53187

Break

? ? Questions for you

Imagine you've created a machine learning model and are eager to share it with others. Consider the following scenarios for sharing your model:

- **To a non-technical Audience:** How would you present your model to friends and family who may not have a technical background?
- **To a technical audience:** How would you share your model with peers or professionals in the field who have a technical understanding of machine learning?
- **In an academic or research setting:** How would you disseminate your model within academic or research communities?

Try out this moment predictor

<https://cpsc330-moment-predictor.onrender.com/>

- In this lecture, I will show you how to set up/develop this.

What is deployment?

- After we train a model, we want to use it!
- The user likely does not want to install your Python stack, train your model.
- You don't necessarily want to share their dataset.
- So we need to do two things:
 1. Save/store your model for later use.
 2. Make the saved model conveniently accessible.

We will use the tools below for

- Saving the model: We will use **Joblib**
- Making the saved model conveniently accessible: **Flask & render**

Group Work: Class Demo & Live Coding

For this demo, each student should [click this link](#) to create a new repo in their accounts, then clone that repo locally to follow along with the demo from today.

Web App

API

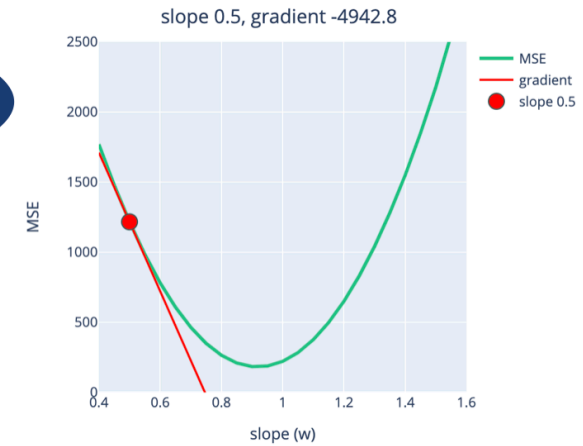
What did we cover

- Part 1: Supervised learning on tabular data: ML fundamentals, preprocessing and data encoding, a bunch of models, evaluation metrics, feature importances and model transparency, feature selection, hyperparameter optimization
- Part 2: Dealing with other non-tabular data types: Clustering, recommender systems, computer vision with pre-trained deep learning models (high level), language data, text preprocessing, embeddings, topic modeling, time series, right-censored data / survival analysis
- Part 3: Communication, Ethics, and Deployment

What we didn't cover

- How do these models work under the hood

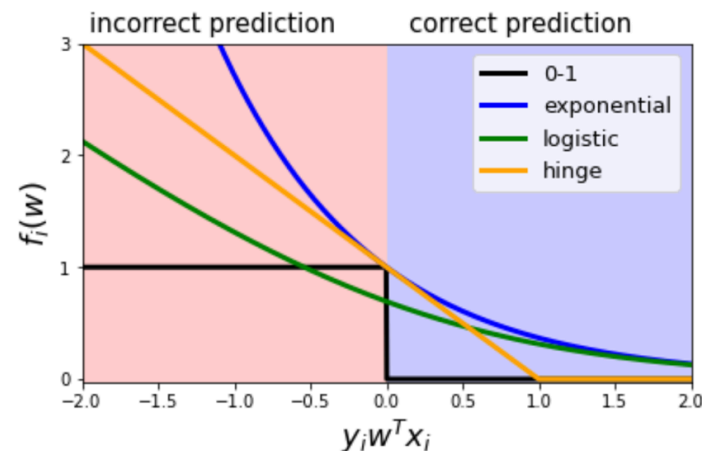
Supervised ML training



Pick a model

Loss function

Optimization



What would I do differently?

Lots of room for improvement. Here are some things on my mind.

- Balance the pace of the course a bit more (too intense at the beginning, too relaxed at the end!)
- Flipped classroom in a more effective way in the first part of the course.
- More demos during lecture time
- Worksheets/practice questions during tutorials
- Add a course project !?!
- Add more interactive components in the lectures
- Some material to cover: dealing with outliers, data collection, large language models

What next?

If you want to further develop your machine learning skills: – Practice! – Work on your own projects – Work hard and be consistent.

- If you are interested in research in machine learning
 - Take CPSC 340. If you do not have the required prereqs you can try to audit it.
- Get into the habit of reading papers and replicating results

? ? Questions for you

For each of the scenarios below

- Identify if ML is a good solution for a problem.
- If yes
 - Frame the problem to a ML problem.
 - Discuss what kind of features you would need to effectively solve the problem
 - What would be a reasonable baseline?
 - Which model would be a suitable model for the given scenario?
 - What would be the appropriate success metrics.

? ? Questions for you

App	Goal
QueuePredictor app	Inform callers how long they'll wait on hold given the current call volume
To-doList App	Keep track of the tasks that a user inputs and organize them by date
SegmentSphere App	To segment customers to tailor marketing strategies based on purchasing behavior
Video app	Recommend useful videos
Dining app	Identify cuisine by a restaurant's menu
Weather app	Calculate precipitation in six hour increments for a geographic region
EvoCarShare app	Calculate number of car rentals in four increments at a particular Evo parking spot
Pharma app	Understand the effect of a new drug on patient survival time

Conclusion & farewell

That's all, folks. We made it! Good luck on your final exam! When you get a chance, please let me know what worked for you and what didn't work for you in this course.

