# CPSC 330 Lecture 24: Deployment and conclusion

Varada Kolhatkar

# Announcements

- Last lecture today!
- HW9 is due today Dec 5th at 11:59 PM (No late submission allowed.)
- Ethics bonus assignment is due tomorrow at 11:59pm.
- I'll be holding OH on December 11th from 2 to 3:30

# ? ? 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

# Class demo

# Course evaluations (~15 mins)

https://canvas.ubc.ca/courses/149122/external_tools/53187

- They help us improve our teaching!
- UBC & CS uses them to provide rewards to instructors and TAs who are doing well!
- UBC & CS uses them to identify where instructors, TAs and courses need additional supports to improve.
- UBC uses these in evaluating professors for tenure and promotion.
- I'll very much appreciate your constructive and concrete feedback.

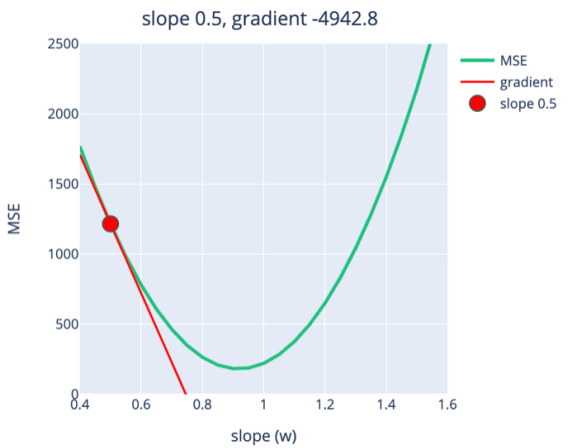
# What did we cover

- 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

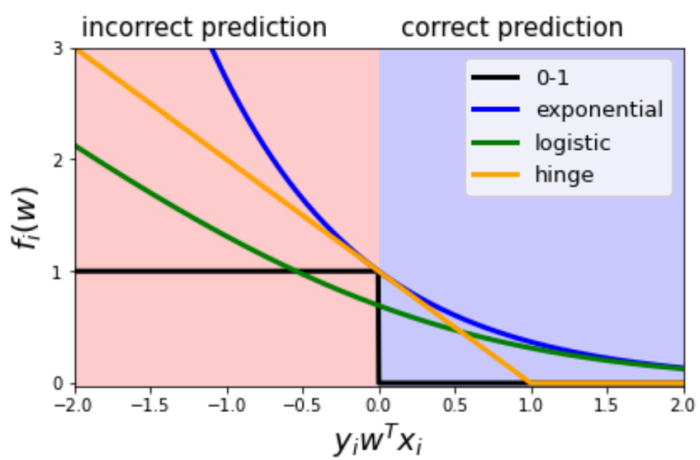
# What we didn't cover

- 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.

- Flipped classroom in a more effective way in the first part of the course.
- More demos during the lecture time
- Worksheets/practice questions during tutorials
- 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 increaments 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.