Exercise 1: Start Clearly and Simply

Write what you'd like the machine learned model to do.

We want the machine learned model to:

We want the machine learned model to predict what building material is needed based on a given design for a building.

Tips for Success

At this point, the statement can be qualitative, but make sure this captures your real goal, not an indirect goal. If you are unsure, take a look at the previous lessons, and see what machine learned models can possibly do.

Exercise 2: Your Ideal Outcome

Adding your ML model to your system should produce a desirable outcome. What is this outcome, independent of the model itself? Note that this outcome may be quite different from how you assess the model and its quality.

Our ideal outcome is:

The ideal outcome of the ML model would be to take in the virtual 3d model design of an architecture building, and then use that model to list out each piece of building material that would be needed to build it. It would give different responses based on the time table,

Tips for Success

You don't need to limit yourself to metrics for which your product has already been optimizing (those will be covered in the next exercise). Instead, try to focus on the larger objective of your product or service.

Exercise 3: Your Success Metrics

Write down your metrics for success and failure with the ML system. The failure metrics are important, that is, how will you know whether the ML system has failed? Both the success and failure metrics should be phrased independently of evaluation metrics for the model. For example, don't talk about precision, recall, or AUC; talk about the anticipated outcomes, instead. Frequently these metrics will be tied to the ideal outcome you specified above.

Our success metrics are:

> The model will be a success if it can output the correct building materials needed and it is what is correct in comparison to the responses of other real-world engineers.

Our ML model is deemed a failure if:

> The model is deemed a failure if the output of building materials needed prove to be unsafe, too little, or too much in comparison to the to the response of other real-world engineers.

Tips for Success

- Are the metrics measurable?

- How will you measure them?

- When will you be able to measure them?

    - How long will it take for you to know whether your new ML system is a success or failure?

- Consider engineering and maintenance costs over the long-term.

- Failure may not only be caused simply by non achievement of a success metric.

Exercise 4: Your Output

Write the output that you want your ML model to produce.

The output from our ML model will be:

> The output for the model will be a text file that houses multiple array combinations of building materials.

The output is defined as one of the following:

- Unidimensional regression

- Multidimensional regression

- Binary classification

- Multiclass classification

- Generate text, image, audio, video, or some combination (multimodal)

the output is multimodal.

Tips for Success

- The output must be quantifiable with a definition that a machine can produce.

- If you're using predictive ML, are you able to obtain example outputs to use for training data?

  - How and from what source?

- Your output examples may need to be engineered, such as turning watch time into a percentile.

- If it is difficult to obtain example outputs to use for training, you may need to revisit your responses to past exercises to reformulate your problem and goals into ones that will allow you to train a model on your data.

Exercise 5: Using the Output

Write when your output must be obtained from the ML model, and how it is used in your product.

The output from the ML model will be obtained when:

The output will be obtained once the model has gone through all possible combinations of building materials that match up with the given design.

The outcome will be used for:

The outcome will be used by the engineer to purchase necessary equipment and will help with budgeting and creating a timeline.

Tips for Success

Consider what data you'll need to make the prediction. For instance, if you're using ML to predict travel time in a maps app, this might be written as, "The output from the model will be obtained when the user selects origin, destination, and mode of transportation."

Consider how you will use the predicted outcome in your product.
- Will it be presented immediately to the user in a UI?

- Will it be consumed by subsequent business logic?

- What latency requirements do you have?

Those requirements (serving requirement of the ML model) can impact what information can be used to make predictions. For example:

- The latency of using data from remote services may make them infeasible to use.

- If data sources lag in making new information available:

    - Processed logs may be generated only once a day.

    - Certain information is not known until it actually happens (such as conversion events).

The Oracle Test: assume you always had the correct answer. How would you use that in your product?

Exercise 6: Your Heuristics

Write how you would solve the problem if you didn't use ML. For example, what heuristics you might use.

If we didn't use ML, we would:

> If ML was not used decision trees would be used. Each type of building design has their own decision tree and the trees will form together and lead to a single component to be used to build.

Tips for Success

Think about a scenario where you need to deliver the product tomorrow, and you can only hardcode the business logic. What would you do?

Click the button below to either print or save your responses as a .pdf.

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