Quality Assessment

System Quality

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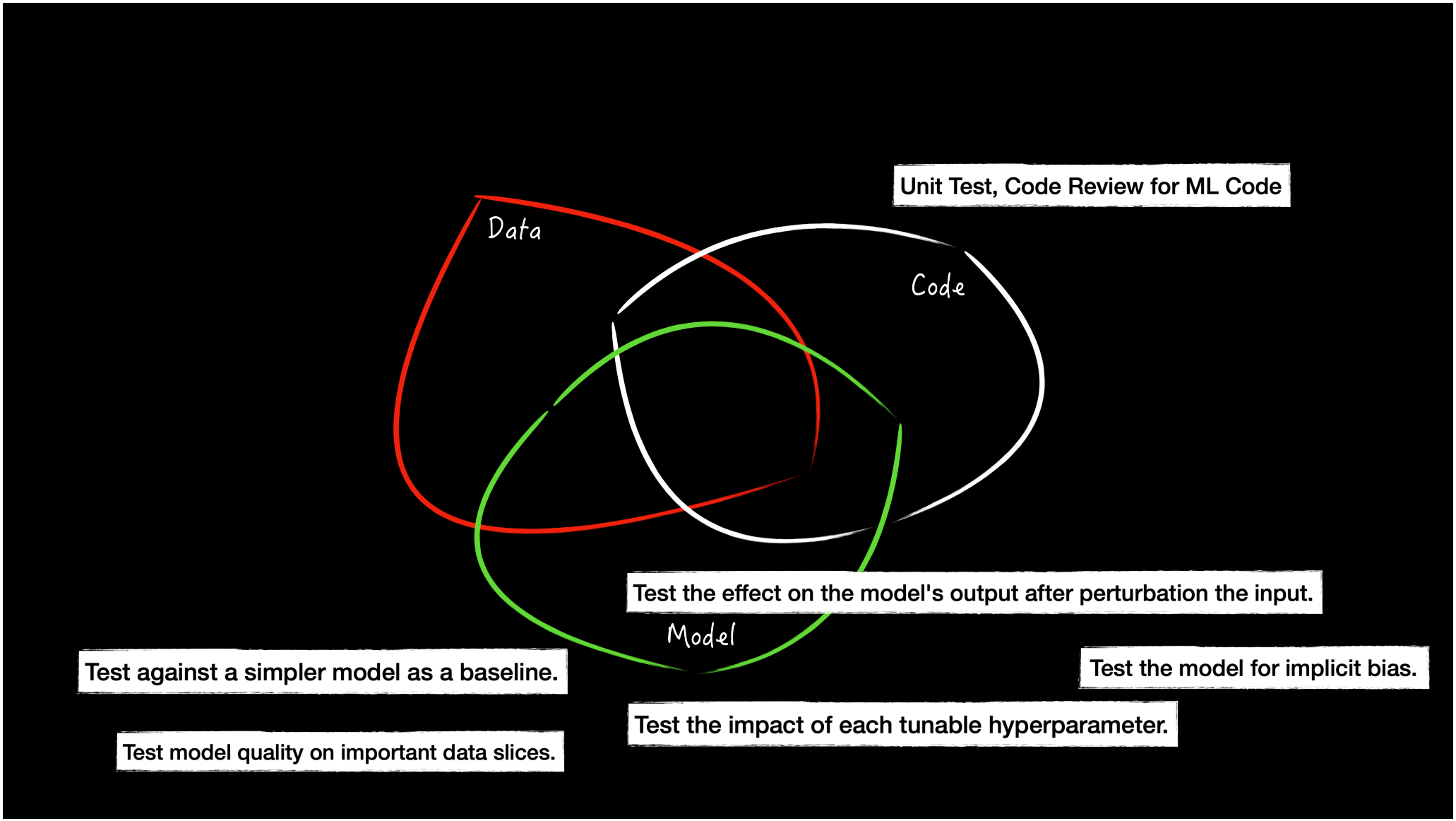

Unit Test, Code Review for ML Code
Data
Code
Model
Test the effect on the model's output after perturbation the input.
Test against a simpler model as a baseline.
Test the model for implicit bias.
Test the impact of each tunable hyperparameter.
Test model quality on important data slices.

Data Slicing

A subset that is particularly relevant for the project/feature objectives.

Input	Actual Output	Model Output
1	No	0.8 -> Yes
2	No	0.7 -> No
3	Yes	0.75 -> No
.....	.....	.....
14	Yes	0.4

Data Slicing

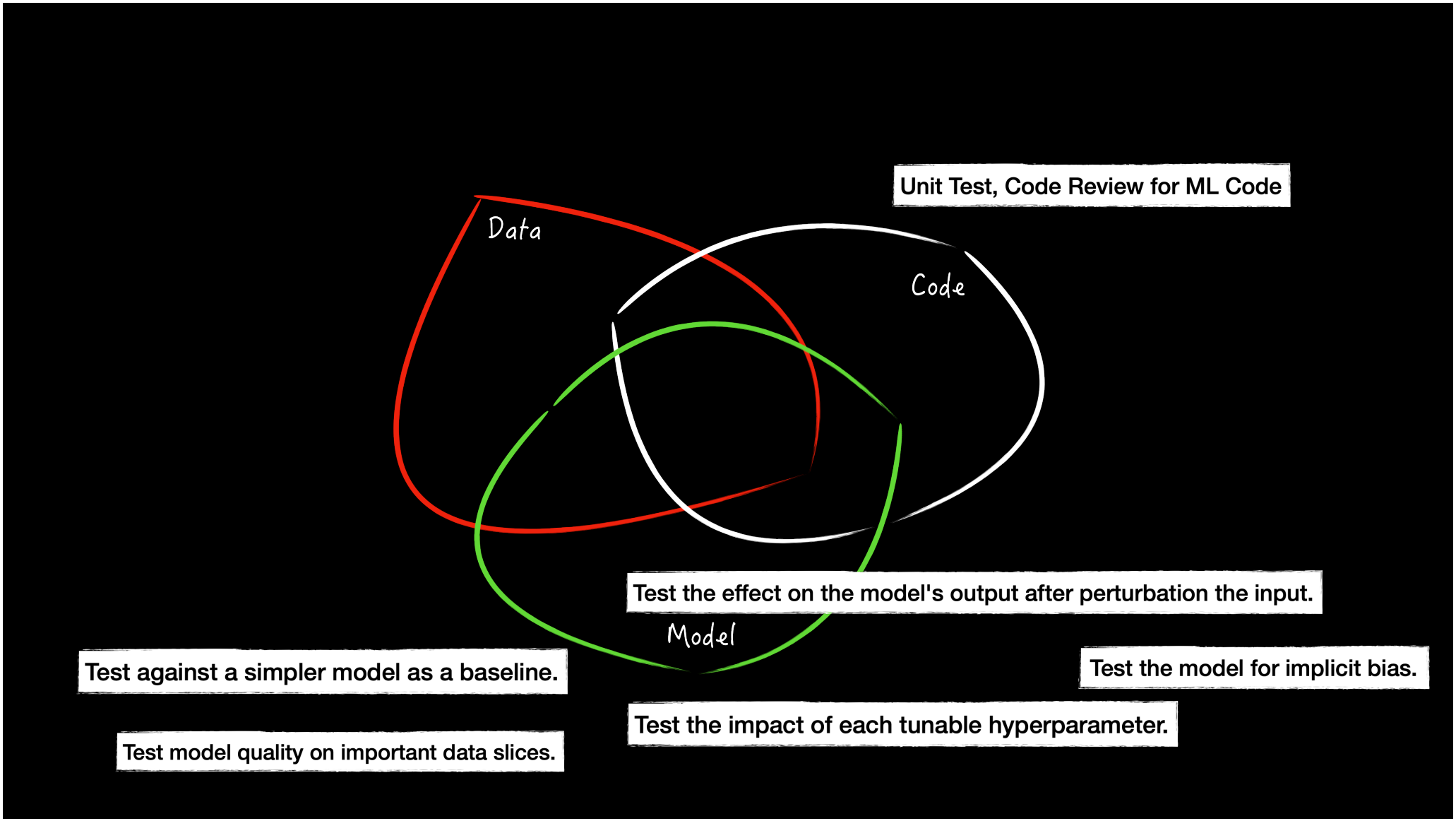
snorkel

```python
from snorkel.slicing import slicing_function


@slicing_function()
def short_link(x):
    """Return whether text matches common pattern for shortened ".ly" links."""
    return int(bool(re.search(r"\w+\.ly", x.text)))


scorer.score_slices(
    S=S_test, golds=Y_test, preds=preds_test, probs=probs_test, as_dataframe=True
)
```

	F1
OVERALL	0.925000
SHORT_COMMENT	0.666667
KEYWORD_PLEASE	1.000000
REGEX_CHECK_OUT	1.000000
SHORT_LINK	0.500000
TEXTBLOB_POLARITY	0.727273

https://www.snorkel.org/use-cases/03-spam-data-slicing-tutorial

Vincent S. Chen, Sen Wu, Zhenzhen Weng, Alexander Ratner, Christopher Ré
"Slice-based Learning: A Programming Model for Residual Learning in Critical Data Slices"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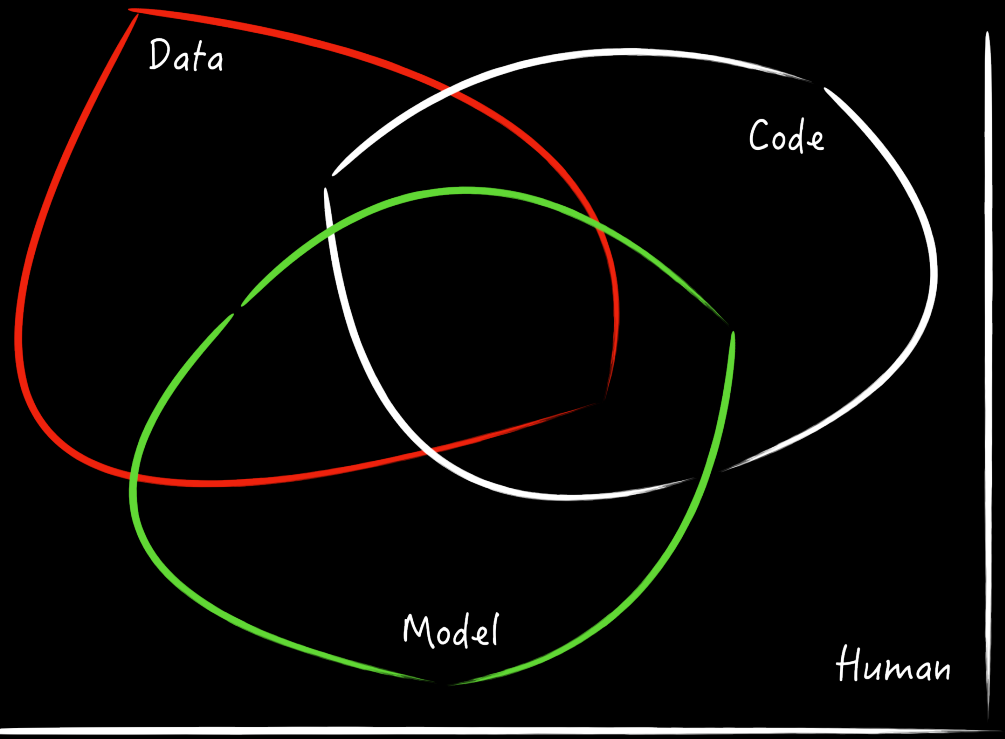
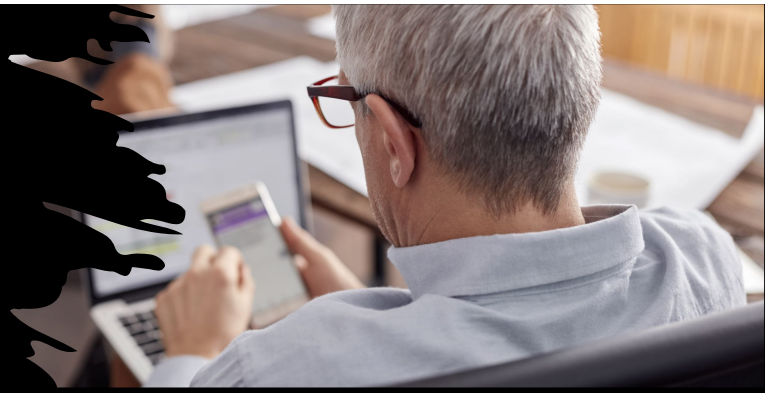


Test the relationship between offline proxy metrics and the actual online impact metrics.

Telemetry Design



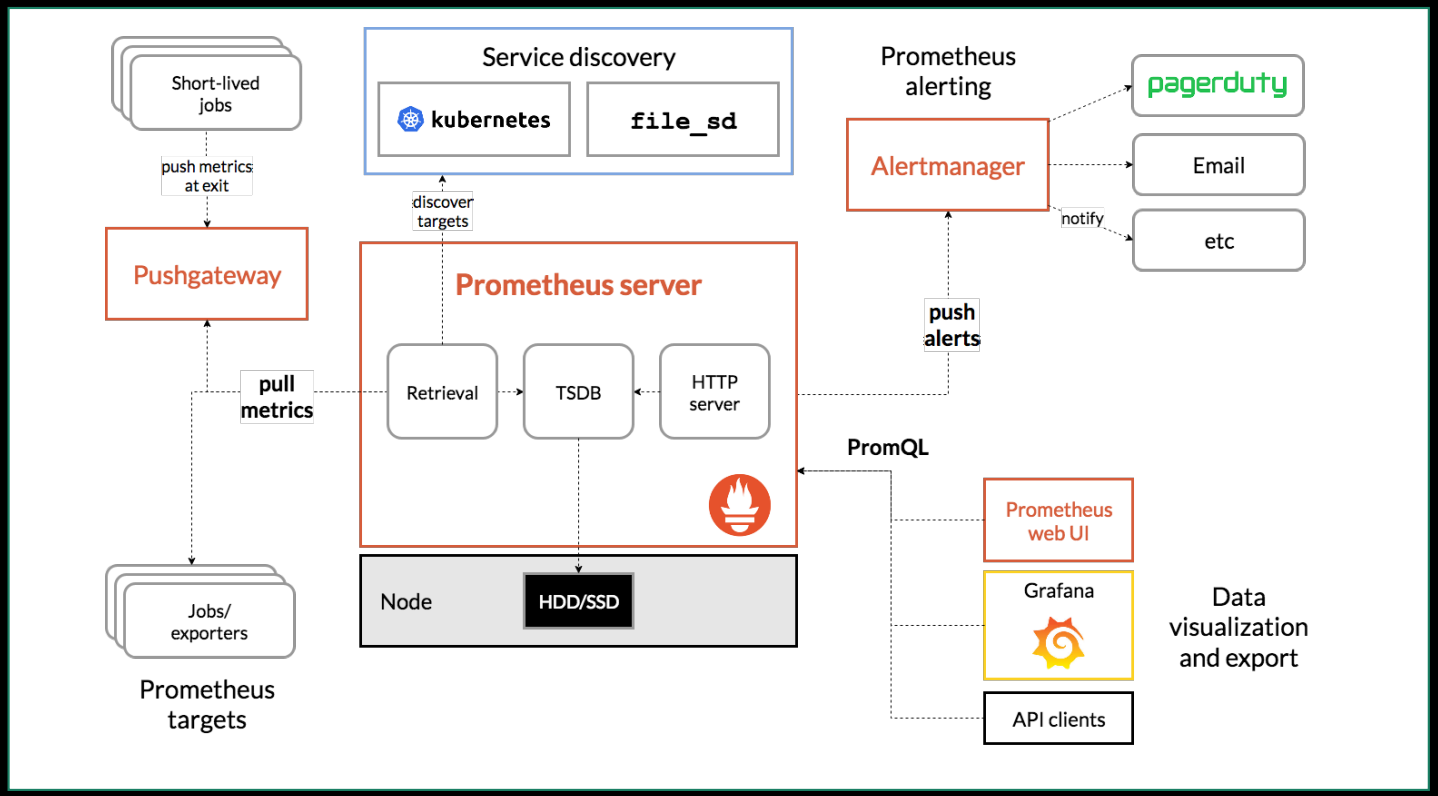
Responsible for collecting observations about how users are interacting with the system

- Monitoring system works correctly

- Understand the impact on users

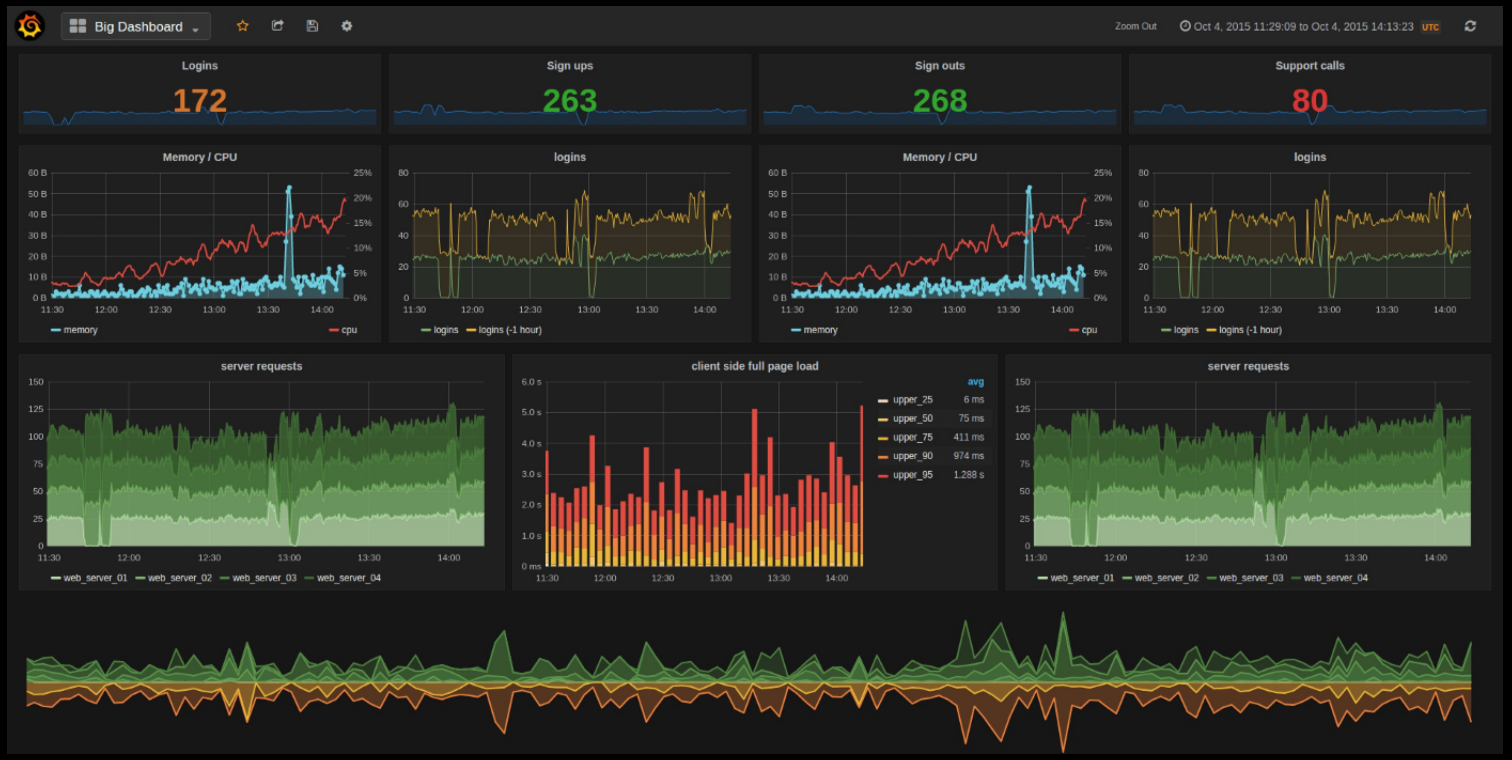
- Gather new training data

Monitoring and alerting



https://prometheus.io/docs/introduction/overview/

Monitoring and alerting



https://medium.com/@pacroy/application-telemetry-with-prometheus-sap-blogs-c4b5b6239d28ke

Understand Impact on Users

To determine if users are getting positive or negative outcomes and if the system is achieving its goals.

- Which experiences do users receive and how often do they receive them?
- What actions do users take in each experience?
- What experiences tend to drive users to look for help or to undo or revert their actions?
- What is the average time between users encountering a specific experience and leaving the application?
- Do users who interact more with the intelligent part of the system tend to be more or less engaged (or profitable) over time?

Activity

- Group 1: Amazon: Shopping app feature that detects the shoe brand from photos;
- Group 2: Google: Tagging uploaded photos with friends' names;
- Group 3: Spotify: Recommended personalized playlists;
- Group 4: Microsoft: Code completion recommendation in IDE.

- What information should the telemetry system capture?
- How are you going to use the information to identify and debug potential problems?
- How costly is it to collect the data? How do you plan to manage the cost?
- Any challenges/risks for the your telemetry design?

On next Tuesday:

Continuous Delivery for ML

Intro to Human-AI Interaction