Carnegie Mellon University
Master of Computational Data Science

Carnegie Mellon University
Language Technologies Institute

Predicting Learning Outcomes

Oct 30 Standup

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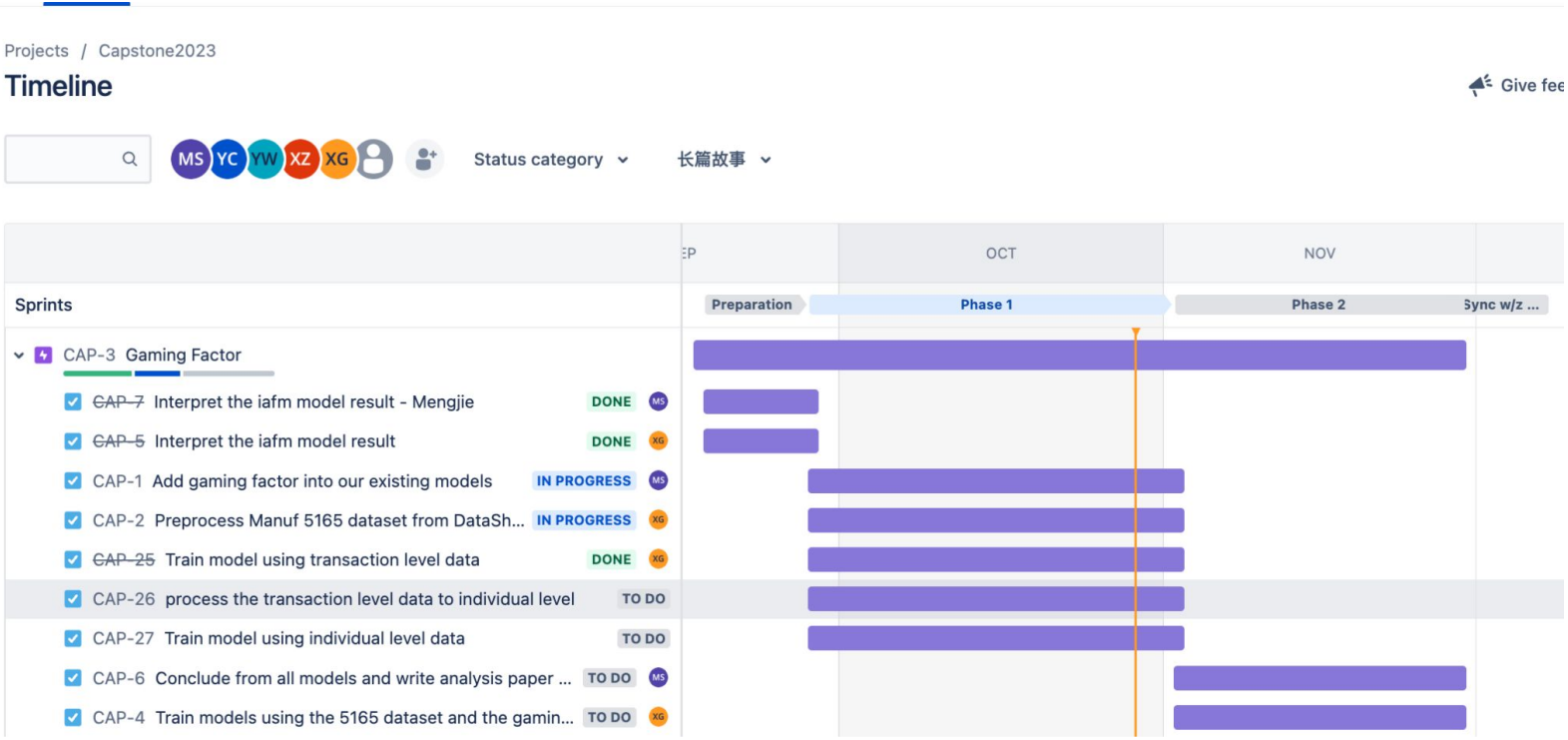
11-632 (Fall 2023)
MCDS Capstone Course

Sub Group 1-Mengjie, Xinyu



Sub Group 1-Mengjie, Xinyu

Last week:

- Revisit dataset with mentors
  - joined two datasets to get the target features
  - merged the data from transaction-level to student step-level

This week:

- Define gaming and convert transaction-level gaming variables into individual-level gaming variables
- Train model using new datasets
- interpret the results & significance of features

Sub Group 2-Xiaoyu Zhang, Yizhou Chen, Yuchen Wang

Last week:

- Process the new dataset (ds5165) to align with the format of the Bernacki dataset
- Train the step-two linear regression model on the processed dataset to predict the student's post-test score with the individual's pre-test score and the iAFM model outcome averaged across all KCs

```
test_scores_with_prediction %>%
  lm(Posttest ~ PredAvgiAFM + Pretest, data = .) %>%
  summ()
```

```
MODEL INFO:
Observations: 129
Dependent Variable: Posttest
Type: OLS linear regression

MODEL FIT:
F(2,126) = 49.19, p = 0.00
R² = 0.44
Adj. R² = 0.43

Standard errors: OLS
------------------------------------------------
                    Est.   S.E.   t val.      p
----------------- ------ ------ -------- ------
(Intercept)         0.09   0.05     1.86   0.07
PredAvgiAFM         0.41   0.10     4.22   0.00
Pretest             0.46   0.09     5.34   0.00
------------------------------------------------
```

Sub Group 2-Xiaoyu Zhang, Yizhou Chen, Yuchen Wang

This week:

- Inspect model results with respect to the research question: using student parameter estimates derived from modeling the learning process data (ds5165), how well and how best can we predict student performance on data a post-test after the learning process and a pre-test before it.
- Try to incorporate individual student parameters (int_iAFM) into the step-two model on the new dataset
- Report and analyze the result regarding the research question

Sub Group 2-Xiaoyu Zhang, Yizhou Chen, Yuchen Wang