Wine Quality MLOps Lab - Screenshot Submission

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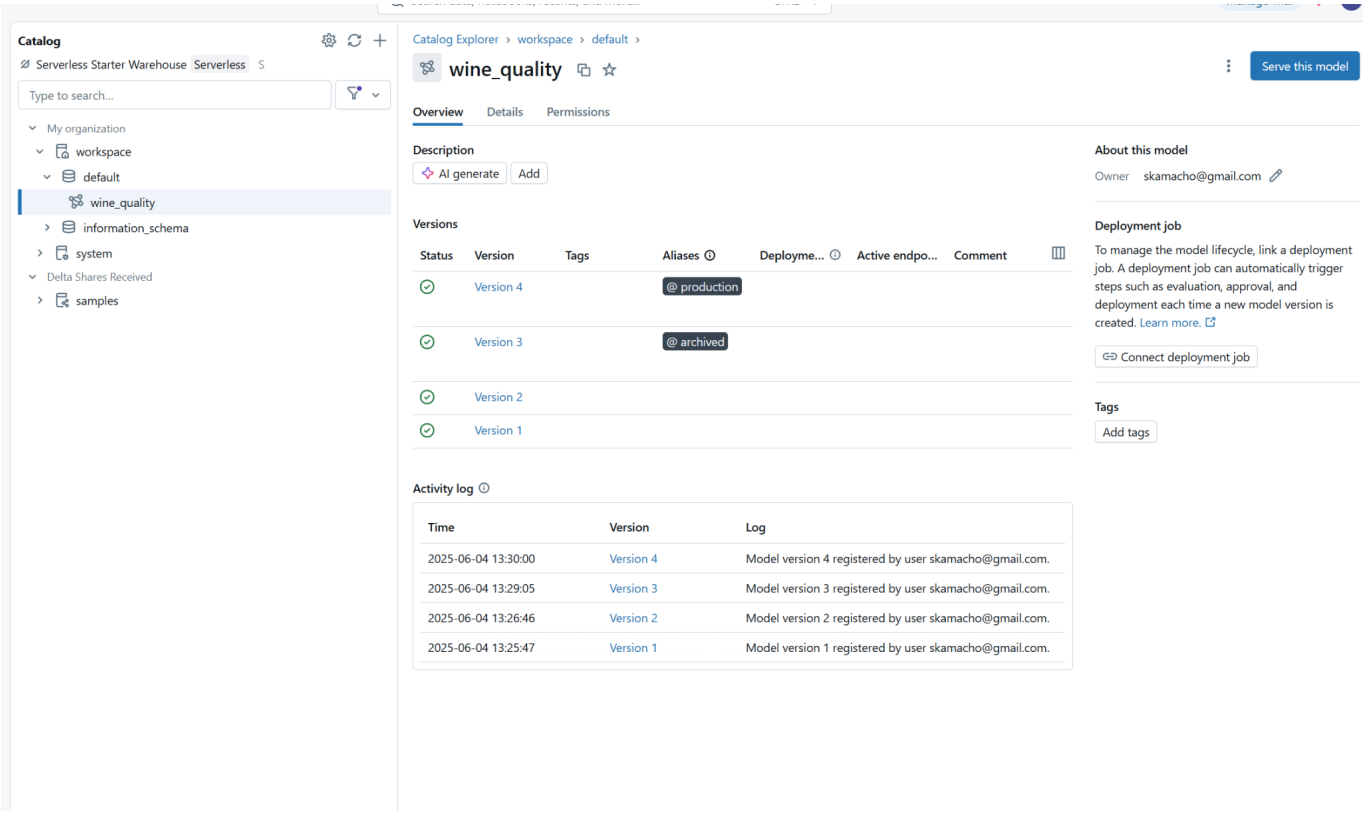
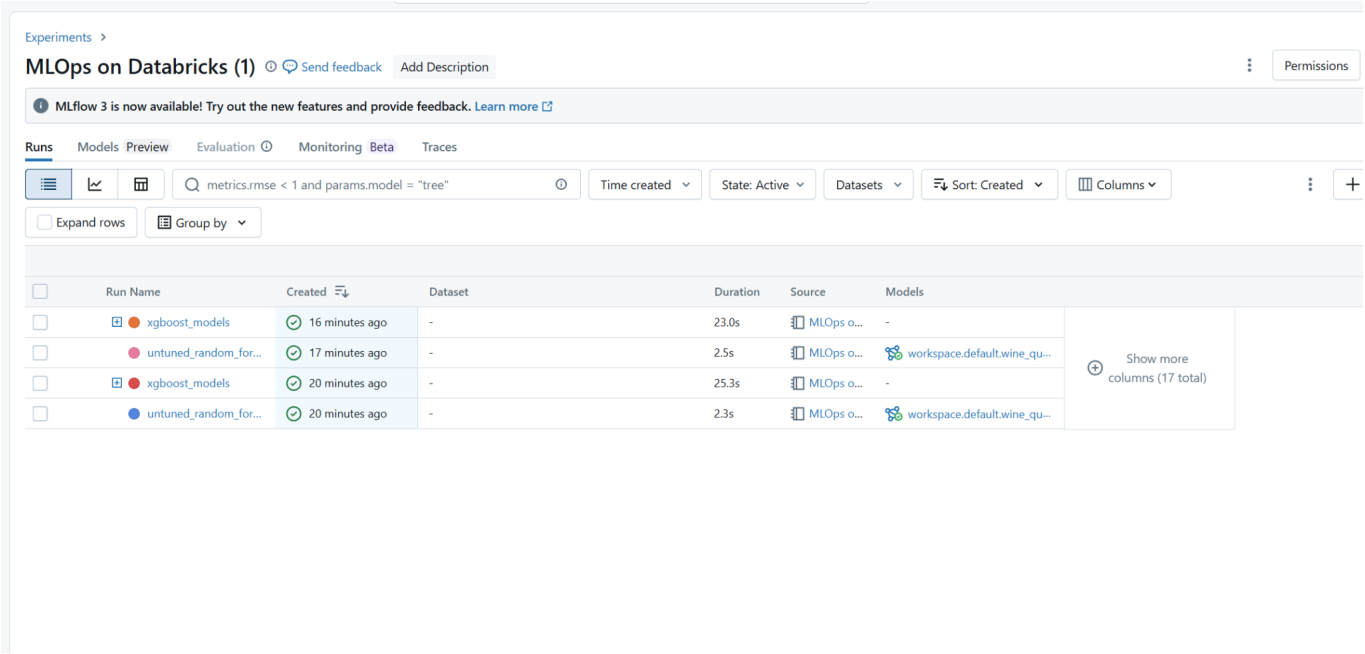
Model Versions (wine_quality model)

This screenshot shows the wine_quality model registered in Unity Catalog with multiple versions. Version 4 is promoted to production. This fulfills the requirement to demonstrate model versioning and promotion.



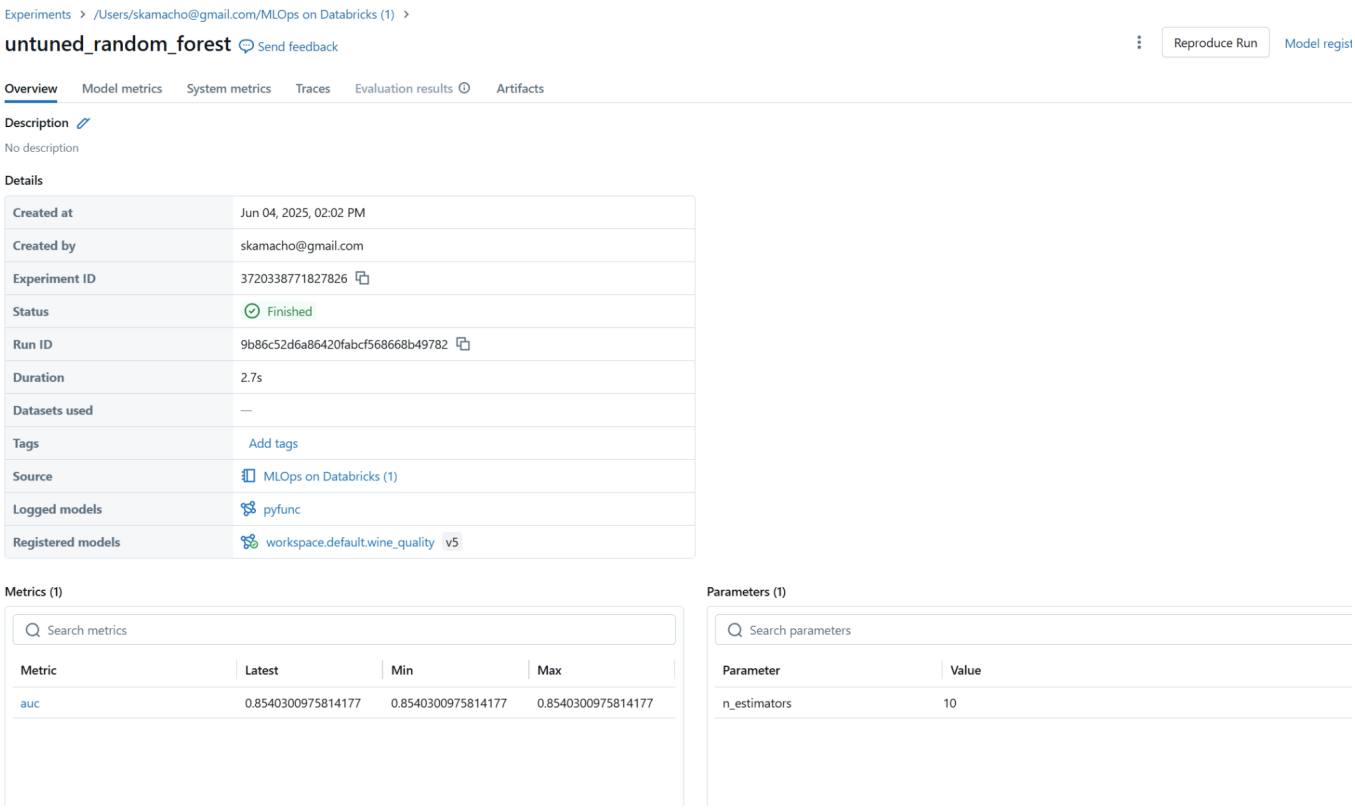
Experiments with AUC Scores

This screenshot displays the Experiments interface, where multiple model runs are tracked and compared. The auc metric is shown, allowing evaluation of model performance.



MLflow Run Details - Parameters and Metrics

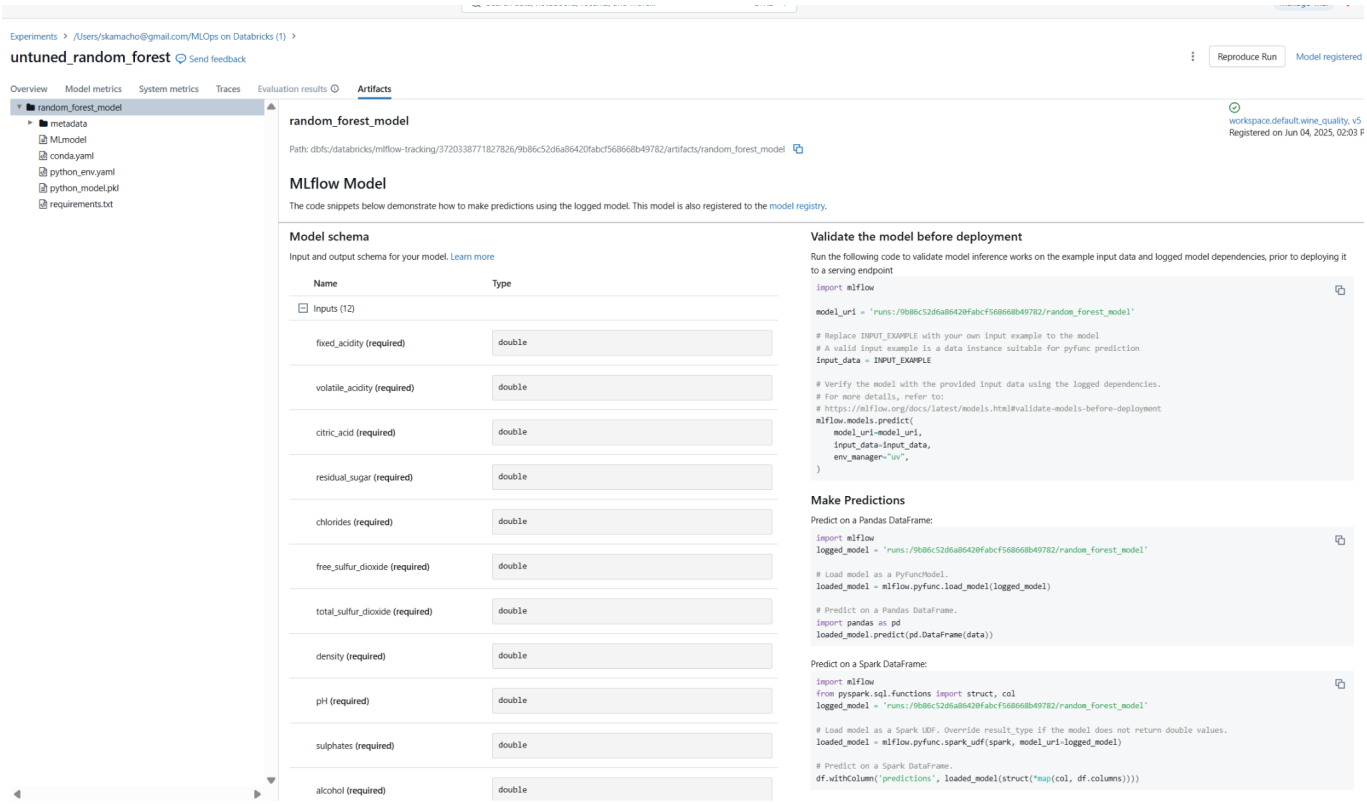
This detailed view shows parameters (like n_estimators) and the auc metric (0.854). It confirms successful experiment logging and model registry linkage.



MLflow Artifacts Tab

The Artifacts tab includes all necessary model files: MLmodel, conda.yaml, and python_model.pkl.

This confirms the model is fully saved and reproducible.



Feature Importance Visualization

This screenshot highlights which features most influenced the model's decisions. Alcohol and density ranked highest.

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```
feature_importances = pd.DataFrame(model.feature_importances_, index=X_train.columns.tolist(), columns=['importance'])
feature_importances.sort_values('importance', ascending=False)
```

feature_importances: pandas.core.frame.DataFrame = [importance: float64]

	importance
alcohol	0.160192
density	0.117415
volatile_acidity	0.093136
chlorides	0.086618
residual_sugar	0.082544
free_sulfur_dioxide	0.080473
pH	0.080212
total_sulfur_dioxide	0.077798
sulphates	0.075780
citric_acid	0.071857
fixed_acidity	0.071841
is_red	0.002134

Key Visualization - Wine Quality Distribution

This histogram supports the binary classification decision by showing how wine ratings cluster. A threshold of 7 was used to define 'high quality'.

Visualize Data

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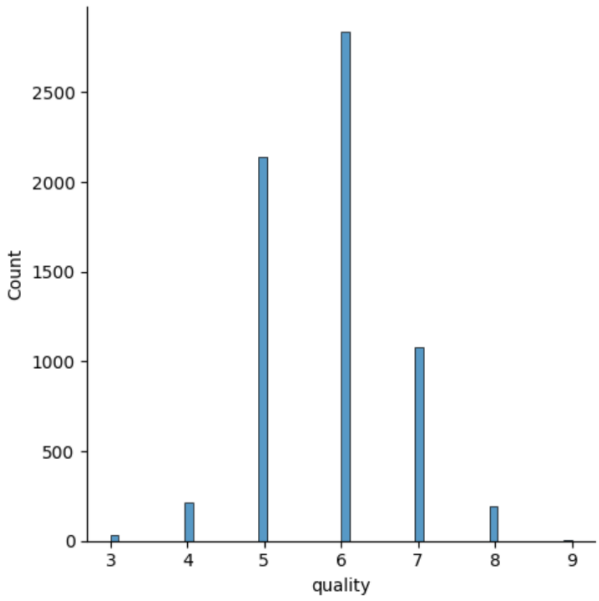
```
import seaborn as sns
sns.displot(data.quality, kde=False)
```

```
<seaborn.axisgrid.FacetGrid at 0x7f46b4f78790>
```



Looks like quality scores are normally distributed between 3 and 9.

Define a wine as high quality if it has quality >= 7.

Confirmation

All required screenshots have been provided and labeled with descriptions. Each fulfills the assignment criteria.