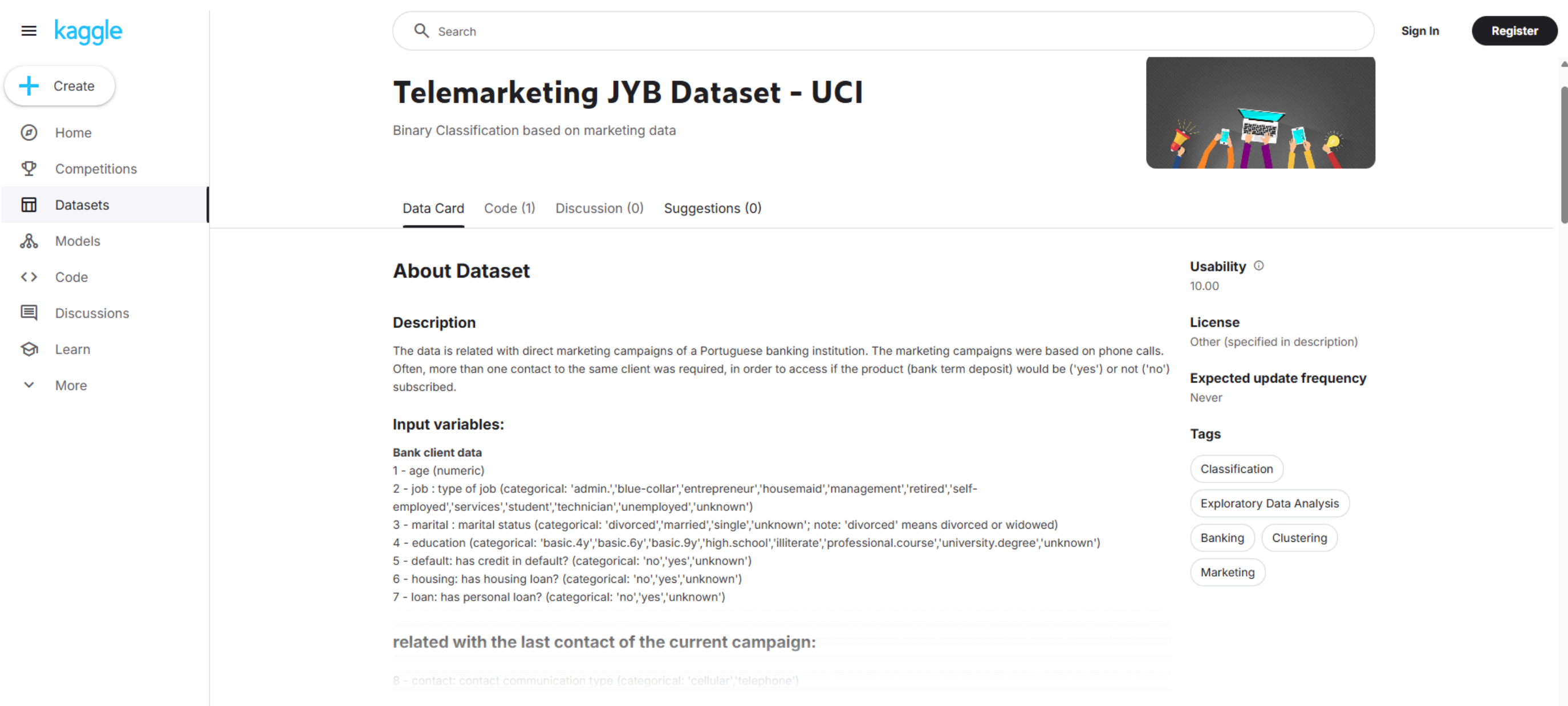


# Uday Bhaskar Voora

## CS 412 Final Project

### Data source



### Hyperparameter tuning

```
},
'SVM': {
  'C': [0.1, 1, 10],
  'kernel': ['linear', 'rbf', 'poly'],
  'degree': [2, 3]
},
'Neural Network': {
  'hidden_layer_sizes': [(32, 32), (64, 64)],
  'activation': ['relu', 'tanh'],
  'solver': ['adam'],
  'learning_rate_init': [0.001, 0.01]
}
```

```
Training Logistic Regression...
Best parameters for Logistic Regression: {'C': 0.1, 'penalty': 'l1', 'solver': 'liblinear'}
Training Decision Tree...
Best parameters for Decision Tree: {'criterion': 'entropy', 'max_depth': 20, 'min_samples_leaf': 1, 'min_samples_split': 2}
Training Random Forest...
Best parameters for Random Forest: {'criterion': 'entropy', 'max_depth': None, 'min_samples_leaf': 1, 'min_samples_split': 2, 'n_estimators': 150}
Training SVM...
Best parameters for SVM: {'C': 10, 'degree': 2, 'kernel': 'rbf'}
```

### Tabnet

```
epoch 19 | loss: 0.25663 | 0:00:18s
Best TabNet params: {'n_steps': 3, 'n_d': 24, 'n_a': 16, 'lambda_sparse': 0.01, 'gamma': 1.3}
```

### LightGBM

```
[LightGBM] [Info] Start training from score 0.955027
Best hyperparameters for LightGBM: {'num_leaves': 31, 'n_estimators': 500, 'max_depth': -1, 'learning_rate': 0.05}
Optimized LightGBM - Accuracy: 0.9480
```

### XGBoost

```
Best XGBoost params: {'colsample_bytree': 1.0, 'learning_rate': 0.2, 'max_depth': 5, 'n_estimators': 200, 'subsample': 0.7}
>> XGBoost (tuned) <<
Accuracy: 0.943
```