

Sprint III

Model Building

Date	12 November 2022
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Project Name	DemandEst - AI powered Food Demand Forecaster

Screenshots:

1. Train and Test Model Algorithms.
2. Model Evaluation
3. Save the Model
4. Predict the output using the model

Model has been built:

Model Building

```
In [38]: from sklearn.tree import DecisionTreeRegressor
```

```
In [40]: model = DecisionTreeRegressor()
model.fit(X_train, y_train)
y_pred = model.predict(X_val)
y_pred[y_pred<0] = 0
```

Model Evaluation

```
In [41]: from sklearn import metrics
print("Root Mean Square Error: ", 100*np.sqrt(metrics.mean_squared_log_error(y_val, y_pred)))
```

Root Mean Square Error: 62.60308582235871

Save The Model

```
In [42]: import pickle
pickle.dump(model, open('fdemand.pkl', 'wb'))
```

Predicting the Output Using the Model

```
In [45]: test_final = pd.merge(test, meal_info, on="meal_id", how="outer")
test_final = pd.merge(test_final, fulfilment_center, on="center_id", how="outer")
test_final = test_final.drop(["meal_id", "center_id"], axis = 1)

tcols = test_final.columns.tolist()
tcols = tcols[:2] + tcols[8:] + tcols[6:8] + tcols[2:6]
test_final = test_final[tcols]
print(tcols)

['id', 'week', 'city_code', 'region_code', 'center_type', 'op_area', 'category', 'cuisine', 'checkout_price', 'base_price', 'emailer_for_promotion', 'homepage_featured']
```

```
In [47]: lb1 = LabelEncoder()
test_final["center_type"] = lb1.fit_transform(test_final["center_type"])
test_final["category"] = lb1.fit_transform(test_final["category"])
test_final["cuisine"] = lb1.fit_transform(test_final["cuisine"])

X_test = test_final[features].values

pred = model.predict(X_test)
pred[pred<0] = 0
submit = pd.DataFrame({
    'id': test_final['id'],
    'num_orders': pred
})
```

```
In [48]: submit.to_csv("submission.csv", index=False)
submit.describe()
```

```
Out[48]:
```

	id	num_orders
count	3.257300e+04	32573.000000
mean	1.248476e+06	262.713247
std	1.441580e+05	363.830450
min	1.000085e+06	15.166667
25%	1.123969e+06	64.526786
50%	1.247296e+06	146.941581
75%	1.372971e+06	321.891304
max	1.499996e+06	5334.736842