[DATE	28-02-2026
TEAM ID	LTVIP2026TMIDS90651
PROJECT NAME	Weather-Based Prediction of Wind Turbine Energy Output: A Next-Generation Approach to Renewable Energy Management
MAXIMUM MARKS	4 MARKS

6.4 - Model Building:

There are several Machine learning algorithms to be used depending on the data you are going to process such as images, sound, text, and numerical values. The algorithms can be chosen according to the objective. As the dataset which we are using is a Regression dataset so you can use the following algorithms

- Linear Regression
- Random Forest Regression / Classification
- Decision Tree Regression / Classification

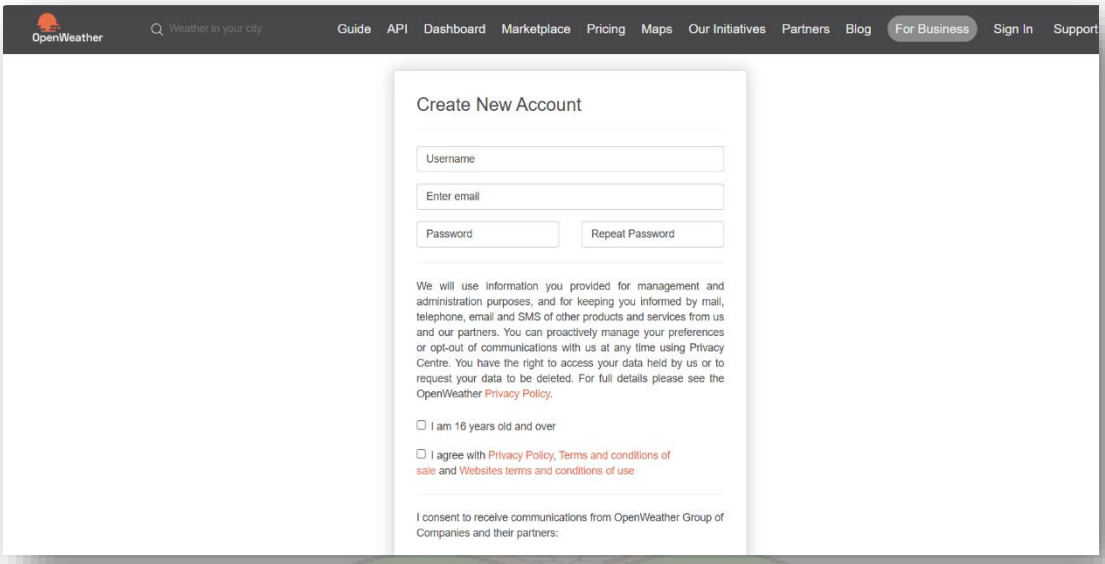
Choose the appropriate model:

```
train_X, val_X, train_y, val_y = train_test_split(
X, y, test_size=0.25, shuffle=False)
model = RandomForestRegressor(
n_estimators=300,
max_depth=6,
min_samples_leaf=5,
random_state=42,
n_jobs=-1
)
model.fit(train_X, train_y)
preds = model.predict(val_X)
print("MAE:", mean_absolute_error(val_y, preds))
print("R² :", r2_score(val_y, preds))
```

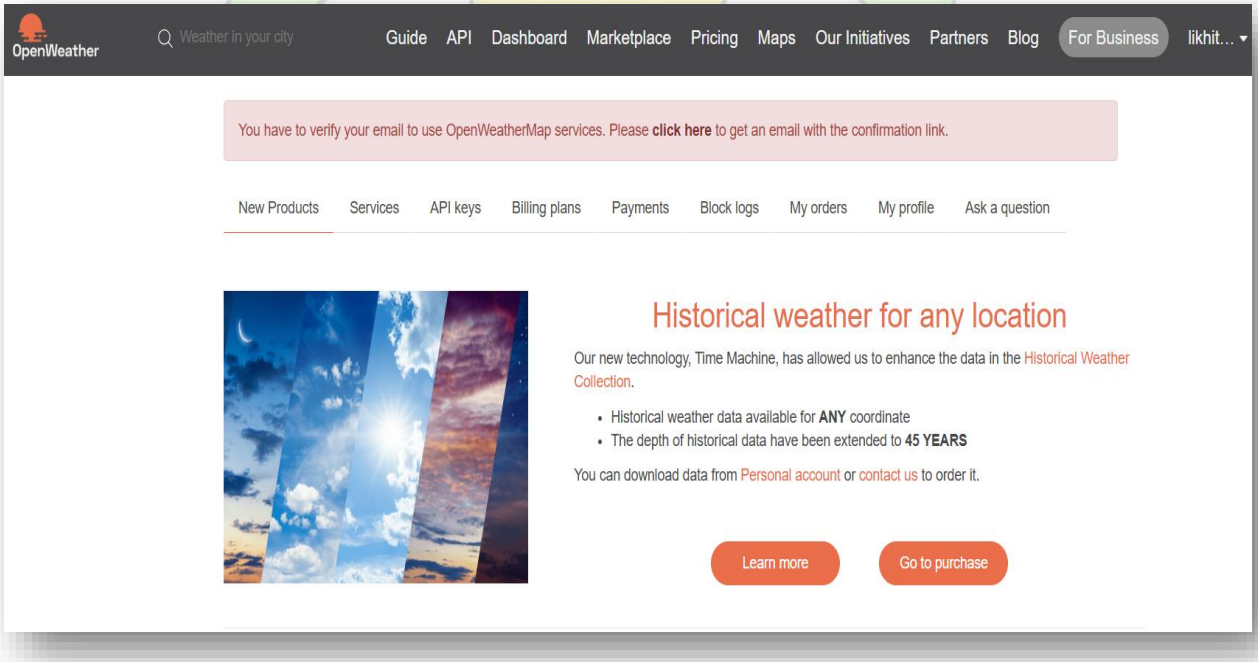
API Integration

Step 1: Signup for Open Weather API for current weather forecasting. To signup

Link: - *https://home.openweathermap.org/users/sign_up*



Step 2: After verification and subscription within 24 hours the API key will be activated.



Step 3: The API Key can be used to get the weather forecast of any of the cities known. The city is passed with parameter q and apikey is to be given with the parameter appid. An example for London city is shown below.