```
import os
```

```
pip install fastf1
```

```
Collecting fastf1
  Downloading fastf1-3.5.3-py3-none-any.whl.metadata (4.6 kB)
Requirement already satisfied: matplotlib<4.0.0,>=3.5.1 in /usr/local/lib/python3.11/dist-packages (from fastf1) (3.10.0)
Requirement already satisfied: numpy<3.0.0,>=1.23.1 in /usr/local/lib/python3.11/dist-packages (from fastf1) (2.0.2)
Requirement already satisfied: pandas<3.0.0,>=1.4.1 in /usr/local/lib/python3.11/dist-packages (from fastf1) (2.2.2)
Requirement already satisfied: python-dateutil in /usr/local/lib/python3.11/dist-packages (from fastf1) (2.8.2)
Collecting rapidfuzz (from fastf1)
  Downloading rapidfuzz-3.12.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (12 kB)
Collecting requests-cache>=1.0.0 (from fastf1)
  Downloading requests_cache-1.2.1-py3-none-any.whl.metadata (9.9 kB)
Requirement already satisfied: requests>=2.28.1 in /usr/local/lib/python3.11/dist-packages (from fastf1) (2.32.3)
Requirement already satisfied: scipy<2.0.0,>=1.8.1 in /usr/local/lib/python3.11/dist-packages (from fastf1) (1.14.1)
Collecting timple>=0.1.6 (from fastf1)
  Downloading timple-0.1.8-py3-none-any.whl.metadata (2.0 kB)
Collecting websockets<14,>=10.3 (from fastf1)
  Downloading websockets-13.1-cp311-cp311-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib<4.0.0,>=3.5.1->fastf1) (1.3.
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.11/dist-packages (from matplotlib<4.0.0,>=3.5.1->fastf1) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib<4.0.0,>=3.5.1->fastf1) (4.5
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib<4.0.0,>=3.5.1->fastf1) (1.4
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib<4.0.0,>=3.5.1->fastf1) (24.2)
Requirement already satisfied: pillow>=8 in /usr/local/lib/python3.11/dist-packages (from matplotlib<4.0.0,>=3.5.1->fastf1) (11.1.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib<4.0.0,>=3.5.1->fastf1) (3.2.
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-packages (from pandas<3.0.0,>=1.4.1->fastf1) (2025.1)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.11/dist-packages (from pandas<3.0.0,>=1.4.1->fastf1) (2025.1)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil->fastf1) (1.17.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests>=2.28.1->fastf1) (3.4.
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests>=2.28.1->fastf1) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests>=2.28.1->fastf1) (2.3.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests>=2.28.1->fastf1) (2025.1.31)
Requirement already satisfied: attrs>=21.2 in /usr/local/lib/python3.11/dist-packages (from requests-cache>=1.0.0->fastf1) (25.3.0)
Collecting cattrs>=22.2 (from requests-cache>=1.0.0->fastf1)
  Downloading cattrs-24.1.2-py3-none-any.whl.metadata (8.4 kB)
Requirement already satisfied: platformdirs>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests-cache>=1.0.0->fastf1) (4.3.6)
Collecting url-normalize>=1.4 (from requests-cache>=1.0.0->fastf1)
  Downloading url_normalize-1.4.3-py2.py3-none-any.whl.metadata (3.1 kB)
Downloading fastf1-3.5.3-py3-none-any.whl (151 kB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 151.2/151.2 kB 4.6 MB/s eta 0:00:00
Downloading requests_cache-1.2.1-py3-none-any.whl (61 kB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 61.4/61.4 kB 4.6 MB/s eta 0:00:00
Downloading timple-0.1.8-py3-none-any.whl (17 kB)
Downloading websockets-13.1-cp311-cp311-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux_2_17_x86_64.manylinux2014_x86_64.whl (164 kB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 164.8/164.8 kB 11.7 MB/s eta 0:00:00
Downloading rapidfuzz-3.12.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (3.1 MB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 3.1/3.1 MB 53.7 MB/s eta 0:00:00
Downloading cattrs-24.1.2-py3-none-any.whl (66 kB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 66.4/66.4 kB 4.7 MB/s eta 0:00:00
Downloading url_normalize-1.4.3-py2.py3-none-any.whl (6.8 kB)
Installing collected packages: websockets, url-normalize, rapidfuzz, cattrs, requests-cache, timple, fastf1
  Attempting uninstall: websockets
    Found existing installation: websockets 14.2
    Uninstalling websockets-14.2:
      Successfully uninstalled websockets-14.2
Successfully installed cattrs-24.1.2 fastf1-3.5.3 rapidfuzz-3.12.2 requests-cache-1.2.1 timple-0.1.8 url-normalize-1.4.3 websockets-13.1
```

Generate | genrate a code for china 2025 qualiflying top 10 drivers | Close

1 of 1 | Undo Changes | Use code with caution

```
# prompt: genrate a code for china 2025 qualiflying top 10 drivers
import fastf1
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.ensemble import GradientBoostingRegressor
from sklearn.metrics import mean_absolute_error
# Load FastF1 2024 Chinese GP race session
session_2024 = fastf1.get_session(2024, 5, "R")  # Chinese GP is typically round 5
session_2024.load()

# Extract lap times
laps_2024 = session_2024.laps[["Driver", "LapTime"]].copy()
laps_2024.dropna(subset=["LapTime"], inplace=True)
```

```
laps_2024["LapTime (s)"] = laps_2024["LapTime"].dt.total_seconds()

# 2025 Qualifying Data for Chinese GP (replace with your actual data)
qualifying_2025 = pd.DataFrame({
    "Driver": ["Lando Norris", "Oscar Piastri", "Max Verstappen", "George Russell", "Yuki Tsunoda",
               "Alexander Albon", "Charles Leclerc", "Lewis Hamilton", "Pierre Gasly", "Carlos Sainz Jr."],
    "QualifyingTime (s)": [1.20, 1.22, 1.18, 1.21, 1.23,
                           1.24, 1.20, 1.22, 1.23, 1.21]
})

# Map full names to FastF1 3-letter codes for Chinese GP
driver_mapping = {
    "Lando Norris": "NOR", "Oscar Piastri": "PIA", "Max Verstappen": "VER", "George Russell": "RUS",
    "Yuki Tsunoda": "TSU", "Alexander Albon": "ALB", "Charles Leclerc": "LEC", "Lewis Hamilton": "HAM",
    "Pierre Gasly": "GAS", "Carlos Sainz Jr.": "SAI"
}
qualifying_2025["DriverCode"] = qualifying_2025["Driver"].map(driver_mapping)

# Merge 2025 Qualifying Data with 2024 Race Data
merged_data = qualifying_2025.merge(laps_2024, left_on="DriverCode", right_on="Driver")

# Use only "QualifyingTime (s)" as a feature
X = merged_data[["QualifyingTime (s)"]]
y = merged_data["LapTime (s)"]

# Check if X is empty
if X.shape[0] == 0:
    raise ValueError("Dataset is empty after preprocessing. Check data sources!")

# Train Gradient Boosting Model
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=39)
model = GradientBoostingRegressor(n_estimators=100, learning_rate=0.1, random_state=39)
model.fit(X_train, y_train)

# Predict using 2025 qualifying times
predicted_lap_times = model.predict(qualifying_2025[["QualifyingTime (s)"]])
qualifying_2025["PredictedRaceTime (s)"] = predicted_lap_times

# Rank drivers by predicted race time
qualifying_2025 = qualifying_2025.sort_values(by="PredictedRaceTime (s)")

# Print final prediction
print("\n=== Predicted 2025 Chinese GP Top 10 ===\n")
print(qualifying_2025[["Driver", "PredictedRaceTime (s)"]].head(10))

# Evaluate Model
y_pred = model.predict(X_test)
print(f"Model Error (MAE): {mean_absolute_error(y_test, y_pred):.2f} seconds")
```

```
req            INFO     Data has been written to cache!
INFO:fastf1.fastf1.req:Data has been written to cache!
req            INFO     No cached data found for race_control_messages. Loading data...
INFO:fastf1.fastf1.req:No cached data found for race_control_messages. Loading data...
_api           INFO     Fetching race control messages...
INFO:fastf1.api:Fetching race control messages...
req            INFO     Data has been written to cache!
INFO:fastf1.fastf1.req:Data has been written to cache!
core        WARNING     Driver 1 completed the race distance 00:08.313000 before the recorded end of the session.
WARNING:fastf1.fastf1.core:Driver 1 completed the race distance 00:08.313000 before the recorded end of the session.
core           INFO     Finished loading data for 20 drivers: ['1', '4', '11', '16', '55', '63', '14', '81', '44', '27', '31', '23',
INFO:fastf1.fastf1.core:Finished loading data for 20 drivers: ['1', '4', '11', '16', '55', '63', '14', '81', '44', '27', '31', '23',

=== Predicted 2025 Chinese GP Top 10 ===

             Driver  PredictedRaceTime (s)
2    Max Verstappen             106.395751
0      Lando Norris             107.752303
6   Charles Leclerc             107.752303
3    George Russell             107.856077
9  Carlos Sainz Jr.             107.856077
1     Oscar Piastri             108.936703
7    Lewis Hamilton             108.936703
5   Alexander Albon             109.679800
4      Yuki Tsunoda             109.740189
8      Pierre Gasly             109.740189
Model Error (MAE): 9.16 seconds
```

Start coding or generate with AI.

Start coding or generate with AI.