

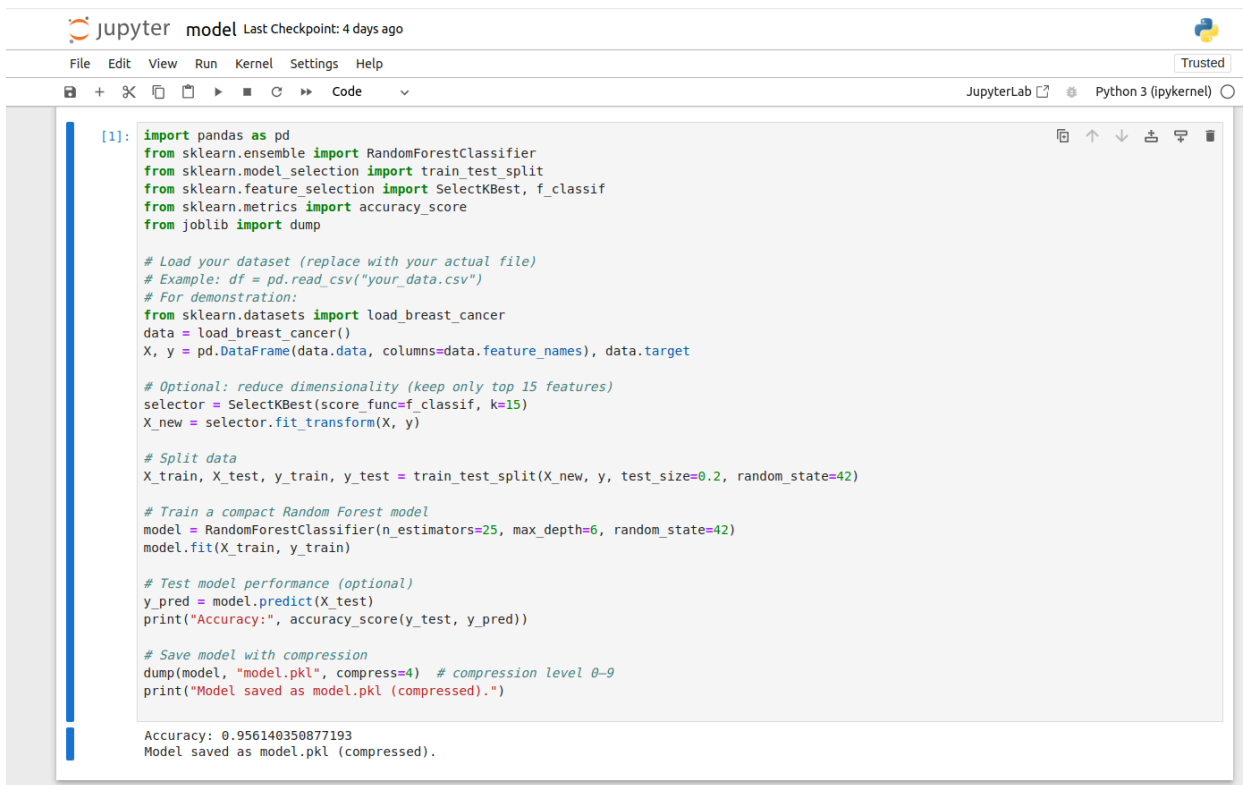
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Batch Code: LISUM45

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Deployment on Flask

- **Prepare the model (Using Toy Data)**



```
[1]: import pandas as pd
from sklearn.ensemble import RandomForestClassifier
from sklearn.model_selection import train_test_split
from sklearn.feature_selection import SelectKBest, f_classif
from sklearn.metrics import accuracy_score
from joblib import dump

# Load your dataset (replace with your actual file)
# Example: df = pd.read_csv("your_data.csv")
# For demonstration:
from sklearn.datasets import load_breast_cancer
data = load_breast_cancer()
X, y = pd.DataFrame(data.data, columns=data.feature_names), data.target

# Optional: reduce dimensionality (keep only top 15 features)
selector = SelectKBest(score_func=f_classif, k=15)
X_new = selector.fit_transform(X, y)

# Split data
X_train, X_test, y_train, y_test = train_test_split(X_new, y, test_size=0.2, random_state=42)

# Train a compact Random Forest model
model = RandomForestClassifier(n_estimators=25, max_depth=6, random_state=42)
model.fit(X_train, y_train)

# Test model performance (optional)
y_pred = model.predict(X_test)
print("Accuracy:", accuracy_score(y_test, y_pred))

# Save model with compression
dump(model, "model.pkl", compress=4) # compression level 0-9
print("Model saved as model.pkl (compressed).")

Accuracy: 0.956140350877193
Model saved as model.pkl (compressed).
```

- **Project Structure**


```
Open ▾ + index.html
~/Documents/Job/courses/DataGlacier/ml-flask-app/templates

index.html x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <title>Breast Cancer Prediction</title>
6   <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css">
7 </head>
8 <body class="bg-light">
9   <div class="container mt-5">
10    <h2 class="mb-4">Enter Tumor Features</h2>
11    <form action="/predict" method="post" class="row g-3">
12      <div class="col-md-6">
13        <label for="radius" class="form-label">Mean Radius</label>
14        <input type="number" step="any" name="mean radius" class="form-control" required>
15      </div>
16      <div class="col-md-6">
17        <label for="texture" class="form-label">Mean Texture</label>
18        <input type="number" step="any" name="mean texture" class="form-control" required>
19      </div>
20      <div class="col-md-6">
21        <label for="perimeter" class="form-label">Mean Perimeter</label>
22        <input type="number" step="any" name="mean perimeter" class="form-control" required>
23      </div>
24      <div class="col-md-6">
25        <label for="area" class="form-label">Mean Area</label>
26        <input type="number" step="any" name="mean area" class="form-control" required>
27      </div>
28      <div class="col-12">
29        <button type="submit" class="btn btn-primary">Predict</button>
30      </div>
31    </form>
32
33    {% if prediction_text %}
34    <div class="alert alert-info mt-4" role="alert">
35      <h4 class="alert-heading">Prediction Result:</h4>
36      <p>{{ prediction_text }}</p>
37    </div>
38    {% endif %}
39  </div>
40 </body>
41 </html>
```

Run the app:

- `python app.py`

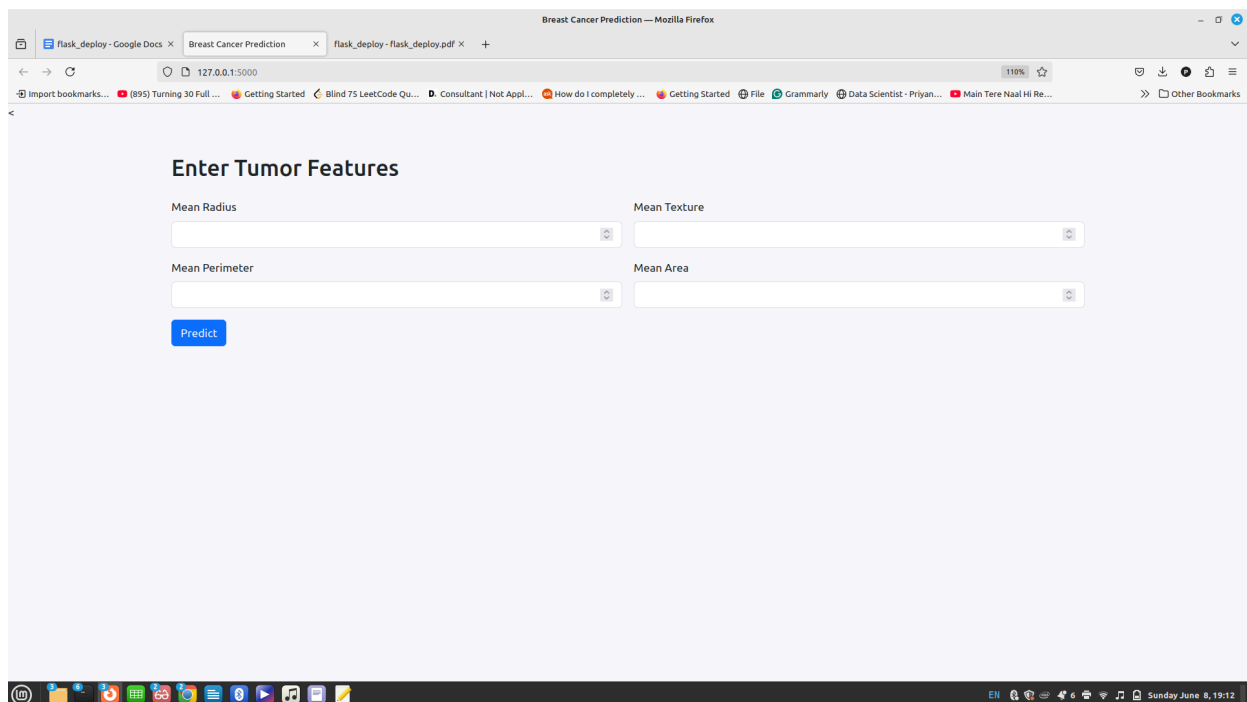
```
Successfully installed blinker-1.9.0 click-8.2.1 flask-3.1.1 itsdangerous-2.2.0 werkzeug-3.1.3
(base) equipo@equipo-ASUS-TUF-Dash-F15-FX517ZC-FX517ZC:~/Documents/Job/courses/DataGlacier/ml-flask-app$ python app.py
* Serving Flask app 'app'
* Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on http://127.0.0.1:5000
Press CTRL+C to quit
* Restarting with stat
* Debugger is active!
* Debugger PIN: 167-711-275
```

Running on <http://127.0.0.1:5000/>

```
equipo@equipo-ASUS-TUF-Dash-F15-FX517ZC-FX517ZC: ~/Documents/Job/courses/DataGlacier/ml-flask-app
File Edit View Search Terminal Tabs Help

equipo@equipo-ASUS-TUF-Dash-F15-FX517ZC-FX517ZC: ~/Documents/Job/courses/DataGlacier/ml-flask-app
equipo@equipo-ASUS-TUF-Dash-F15-FX517ZC-FX517ZC: ~/Documents/Job/courses/DataGlacier/ml-flask-app/templates

Installing collected packages: werkzeug, itsdangerous, click, blinker, flask
Successfully installed blinker-1.9.0 click-8.2.1 flask-3.1.1 itsdangerous-2.2.0 werkzeug-3.1.3
(base) equipo@equipo-ASUS-TUF-Dash-F15-FX517ZC-FX517ZC:~/Documents/Job/courses/DataGlacier/ml-flask-app$ python app.py
* Serving Flask app 'app'
* Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on http://127.0.0.1:5000
Press CTRL+C to quit
* Restarting with stat
* Debugger is active!
* Debugger PIN: 167-711-275
^C
(base) equipo@equipo-ASUS-TUF-Dash-F15-FX517ZC-FX517ZC:~/Documents/Job/courses/DataGlacier/ml-flask-app$ http://127.0.0.1:5000/
bash: http://127.0.0.1:5000/: No such file or directory
(base) equipo@equipo-ASUS-TUF-Dash-F15-FX517ZC-FX517ZC:~/Documents/Job/courses/DataGlacier/ml-flask-app$ flask run
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on http://127.0.0.1:5000
Press CTRL+C to quit
127.0.0.1 - - [08/Jun/2025 18:53:48] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [08/Jun/2025 18:53:49] "GET /prediction HTTP/1.1" 404 -
2025-06-08 18:53:59.672] ERROR in app: Exception on /predict [POST]
Traceback (most recent call last):
  File "/home/equipo/miniconda3/lib/python3.12/site-packages/flask/app.py", line 1511, in wsgi_app
    response = self.full_dispatch_request()
               ~~~~~
  File "/home/equipo/miniconda3/lib/python3.12/site-packages/flask/app.py", line 919, in full_dispatch_request
    rv = self.handle_user_exception(e)
        ~~~~~
  File "/home/equipo/miniconda3/lib/python3.12/site-packages/flask/app.py", line 917, in full_dispatch_request
    rv = self.dispatch_request()
        ~~~~~
  File "/home/equipo/miniconda3/lib/python3.12/site-packages/flask/app.py", line 902, in dispatch_request
    return self.ensure_sync(self.view_functions[rule.endpoint])(**view_args)  # type: ignore[no-any-return]
           ~~~~~
  File "/home/equipo/Documents/Job/courses/DataGlacier/ml-flask-app/app.py", line 15, in predict
    prediction = model.predict([inputs])[0]
                ~~~~~
  File "/home/equipo/miniconda3/lib/python3.12/site-packages/sklearn/ensemble/_forest.py", line 994, in predict
    proba = self.predict_proba(X)
            ~~~~~
  File "/home/equipo/miniconda3/lib/python3.12/site-packages/sklearn/ensemble/_forest.py", line 946, in predict_proba
    X = self._validate_X_predict(X)
        ~~~~~
  File "/home/equipo/miniconda3/lib/python3.12/site-packages/sklearn/ensemble/_forest.py", line 638, in _validate_X_predict
    X = validate_data(
        ~~~~~
  File "/home/equipo/miniconda3/lib/python3.12/site-packages/sklearn/utils/validation.py", line 2965, in validate_data
    check_n_features(estimator, X, reset=reset)
        ~~~~~
  File "/home/equipo/miniconda3/lib/python3.12/site-packages/sklearn/utils/validation.py", line 2829, in _check_n_features
    raise ValueError(
ValueError: X has 4 features, but RandomForestClassifier is expecting 15 features as input.
127.0.0.1 - - [08/Jun/2025 18:53:59] "POST /predict HTTP/1.1" 500 -
127.0.0.1 - - [08/Jun/2025 18:54:07] "GET / HTTP/1.1" 200 -
```



P.S. : I am getting error in after entering the values of the Tumor Features.

7. Push to GitHub

```
fatal: Authentication failed for 'https://github.com/priyanjalipatel/ml-flask-app.git/'
(base) equipo@equipo-ASUS-TUF-Dash-F15-FX517ZC-FX517ZC:~/Documents/Job/courses/DataGlacier/ml-flask-app$ git push -u origin main
Username for 'https://github.com': priyanjalipatel
Password for 'https://priyanjalipatel@github.com':
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Delta compression using up to 16 threads
Compressing objects: 100% (7/7), done.
Writing objects: 100% (9/9), 21.94 KiB | 10.97 MiB/s, done.
Total 9 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/priyanjalipatel/ml-flask-app.git
 * [new branch]      main -> main
Branch 'main' set up to track remote branch 'main' from 'origin'.
(base) equipo@equipo-ASUS-TUF-Dash-F15-FX517ZC-FX517ZC:~/Documents/Job/courses/DataGlacier/ml-flask-app$
```

- **Summary**