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Batch code: LISUM16
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Submitted to: GitHub

Serializing Model

```
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import classification_report, accuracy_score

clf = RandomForestClassifier()

clf.fit(Xtrain, Ytrain)
predicted = clf.predict(Xtest)

accuracy_score(Ytest, predicted)
```

```
0.8494117647058823
```

```
import pickle

with open('basic_m.pkl', 'wb') as f:
    pickle.dump(clf, f)
```

Creating Flask app

```
@app.route("/", methods = ["GET", "POST"])
def Home():
    return render_template('index.html')


@app.route("/predict/", methods = ["GET", "POST"])
def predict():
    model = pickle.load(open('basic_m.pkl', 'rb'))
    total_night_minutes = request.form['Total Night Minutes']
    voice_mail = request.form['Voice Mail']
    evening_charge = request.form['Total Evening Charge']
    itl_planpre = request.form['International Plan']

    if itl_planpre.lower() == 'no':
        itl_plan = 0
    elif itl_planpre.lower() == 'yes':
        itl_plan = 1

    total_day_calls = request.form['Total Day Calls']
    total_intl_charge = request.form['Total International Charge']

    list_values = [[total_night_minutes, voice_mail, evening_charge, itl_plan, total_day_calls, total_intl_charge]]

    predicted_churn = model.predict(list_values)


    return render_template('index.html', prediction_text = {'Customer Churn : {}'.format(predicted_churn[0])})

if __name__ == '__main__':
    app.run(debug= True)
```

Creating template of web app with html

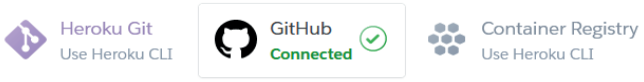
```
    </head>
    <body>
        {% block content %}{% endblock %}

        {% block scripts %}

            {{ bootstrap.load_js() }}
        {% endblock %}
        <div class="login">
            <h1> Predict Churn </h1>
            <form action="{{url_for('predict')}}"method = "post">
                <label for="Total Night Minutes">Total Night Minutes</label><br>
                <input type="text" id="Total Night Minutes" name="Total Night Minutes"><br>
                <label for="Voice Mail">Voice Mail</label><br>
                <input type="text" id="Voice Mail" name="Voice Mail"><br>
                <label for="Total Evening Charge">Total Evening Charge</label><br>
                <input type="text" id="Total Evening Charge" name="Total Evening Charge"><br>
                <label for="International Plan">International Plan</label><br>
                <input type="text" id="International Plan" name="International Plan"><br>
                <label for="Total Day Calls">Total Day Calls</label><br>
                <input type="text" id="Total Day Calls" name="Total Day Calls"><br>
                <label for="Total International Charge">Total International Charge</label><br>
                <input type="text" id="Total International Charge" name="Total International Charge"><br>
                <button type="submit">Submit</button>
            </form>
            <br>
            <br>
            {{ prediction_text }}
        </div>

    </body>
</html>
```

requirements and Procfile

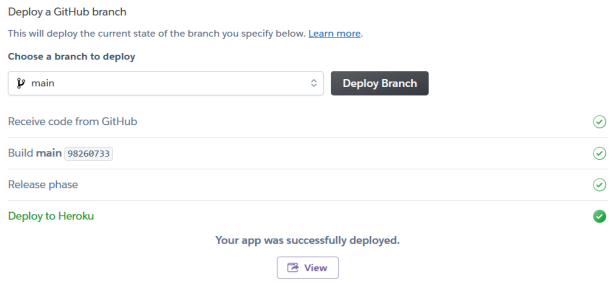
```
numpy ==1.24.1
pandas ==1.5.2
gunicorn ==20.1.0
itsdangerous == 2.1.2
Werkzeug == 2.2.2
MarkupSafe == 2.1.1
Jinja2 == 3.1.2
scikit-learn ==1.2.0
Flask ==2.2.2
matplotlib ==3.6.2
scipy ==1.9.3
pickleshare ==0.7.5
Bootstrap-Flask ==2.2.0
```

```
web: gunicorn app:app
```

Link github to heroku



Deploy ffom repo



Here is the outcome