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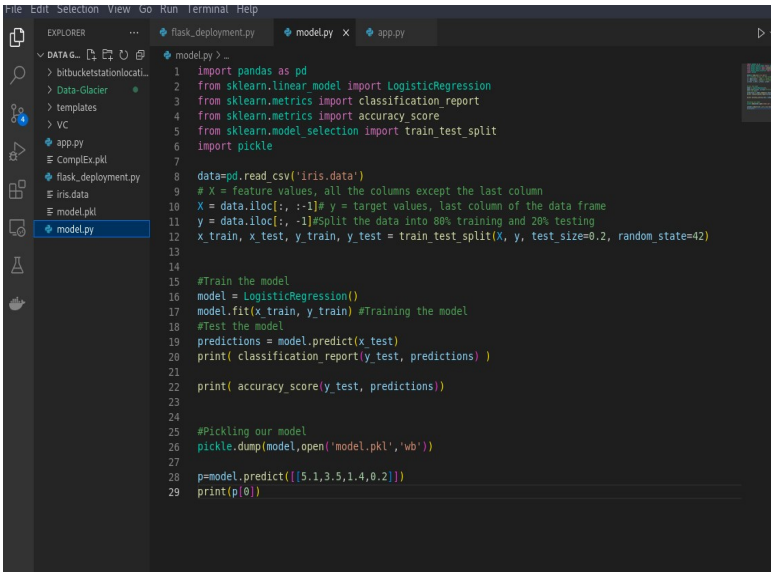
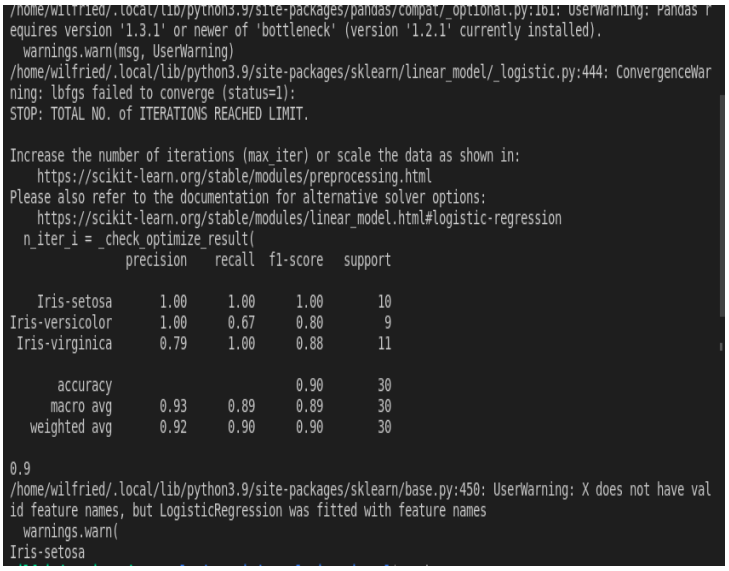
Batch code : app.py
Submission data : 05^{h} October 2022
Submitted to : Data Glacier

1. **Dataset** : Iris data

2. **The model** : the code can be find in the file *model.py* and the model has been save under the name *model.pkl*





3. **Deployment on Heroku (web app)** : We first loaded our model using *pickle* and then we created our app and we wrote a function to do the prediction and print it on our webpage. The code can found in the file *app.py* as showed in the following pictures

app.py > home

```python
import numpy as np
from flask import Flask, request, jsonify, render_template
import pickle

#load our model
model = pickle.load(open('model.pkl', 'rb'))

#create our app
app = Flask(__name__)
@app.route('/')
def home():
    return render_template('index.html')


#we write the function to do the prediction and print it on our webpage
@app.route('/predict',methods=['POST'])
def predict():
    '''
    For rendering results on HTML GUI
    '''
    int_features = [float(x) for x in request.form.values()]

    final_features = [np.array(int_features)]
    prediction = model.predict(final_features)

    output =prediction[0]

    return render_template('index.html', prediction_text='The Flower is {}'.format(output))


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

```
127.0.0.1 - - [28/Sep/2022 22:30:32] "GET / HTTP/1.1" 500 -
Traceback (most recent call last):
  File "/home/wilfried/.local/lib/python3.9/site-packages/flask/app.py", line 2095, in __call__
    return self.wsgi_app(environ, start_response)
  File "/home/wilfried/.local/lib/python3.9/site-packages/flask/app.py", line 2080, in wsgi_app
    response = self.handle_exception(e)
  File "/home/wilfried/.local/lib/python3.9/site-packages/flask/app.py", line 2077, in wsgi_app
    response = self.full_dispatch_request()
  File "/home/wilfried/.local/lib/python3.9/site-packages/flask/app.py", line 1525, in full_dispatch_re
quest
    rv = self.handle_user_exception(e)
  File "/home/wilfried/.local/lib/python3.9/site-packages/flask/app.py", line 1523, in full_dispatch_re
quest
    rv = self.dispatch_request()
  File "/home/wilfried/.local/lib/python3.9/site-packages/flask/app.py", line 1509, in dispatch_request
    return self.ensure_sync(self.view_functions[rule.endpoint])(**req.view_args)
  File "/home/wilfried/Downloads/Tati/data glacier virtual/app.py", line 12, in home
    return render_template('index.html')
  File "/home/wilfried/.local/lib/python3.9/site-packages/flask/templating.py", line 149, in render_tem
plate
    ctx.app.jinja_env.get_or_select_template(template_name_or_list),
  File "/home/wilfried/.local/lib/python3.9/site-packages/jinja2/environment.py", line 1081, in get_or_
select_template
    return self.get_template(template_name_or_list, parent, globals)
  File "/home/wilfried/.local/lib/python3.9/site-packages/jinja2/environment.py", line 1010, in get_tem
plate
    return self._load_template(name, globals)
  File "/home/wilfried/.local/lib/python3.9/site-packages/jinja2/environment.py", line 969, in _load_te
mplate
    template = self.loader.load(self, name, self.make_globals(globals))
  File "/home/wilfried/.local/lib/python3.9/site-packages/jinja2/loaders.py", line 126, in load
    source, filename, uptodate = self.get_source(environment, name)
  File "/home/wilfried/.local/lib/python3.9/site-packages/flask/templating.py", line 59, in get_source
    return self._get_source_fast(environment, template)
  File "/home/wilfried/.local/lib/python3.9/site-packages/flask/templating.py", line 95, in _get_source
_fast
    raise TemplateNotFound(template)
jinja2.exceptions.TemplateNotFound: index.html
127.0.0.1 - - [28/Sep/2022 22:30:33] "GET /?__debugger__=yes&cmd=resource&f=style.css HTTP/1.1" 200 -
127.0.0.1 - - [28/Sep/2022 22:30:33] "GET /?__debugger__=yes&cmd=resource&f=debugger.js HTTP/1.1" 200 -
127.0.0.1 - - [28/Sep/2022 22:30:33] "GET /?__debugger__=yes&cmd=resource&f=console.png HTTP/1.1" 200 -
127.0.0.1 - - [28/Sep/2022 22:30:33] "GET /?__debugger__=yes&cmd=resource&f=console.png HTTP/1.1" 304 -
127.0.0.1 - - [28/Sep/2022 22:35:21] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [28/Sep/2022 22:35:22] "GET /favicon.ico HTTP/1.1" 404 -
/home/wilfried/.local/lib/python3.9/site-packages/sklearn/base.py:450: UserWarning: X does not have val
id feature names, but LogisticRegression was fitted with feature names
  warnings.warn(
127.0.0.1 - - [28/Sep/2022 22:35:43] "POST /predict HTTP/1.1" 200 -
 * Detected change in '/home/wilfried/Downloads/Tati/data glacier virtual/app.py', reloading
 * Restarting with watchdog (inotify)
 * Debugger is active!
 * Debugger PIN: 114-995-408
```

- Then we created an account on Heroku
- We logged in on our terminal as showed in the image below:

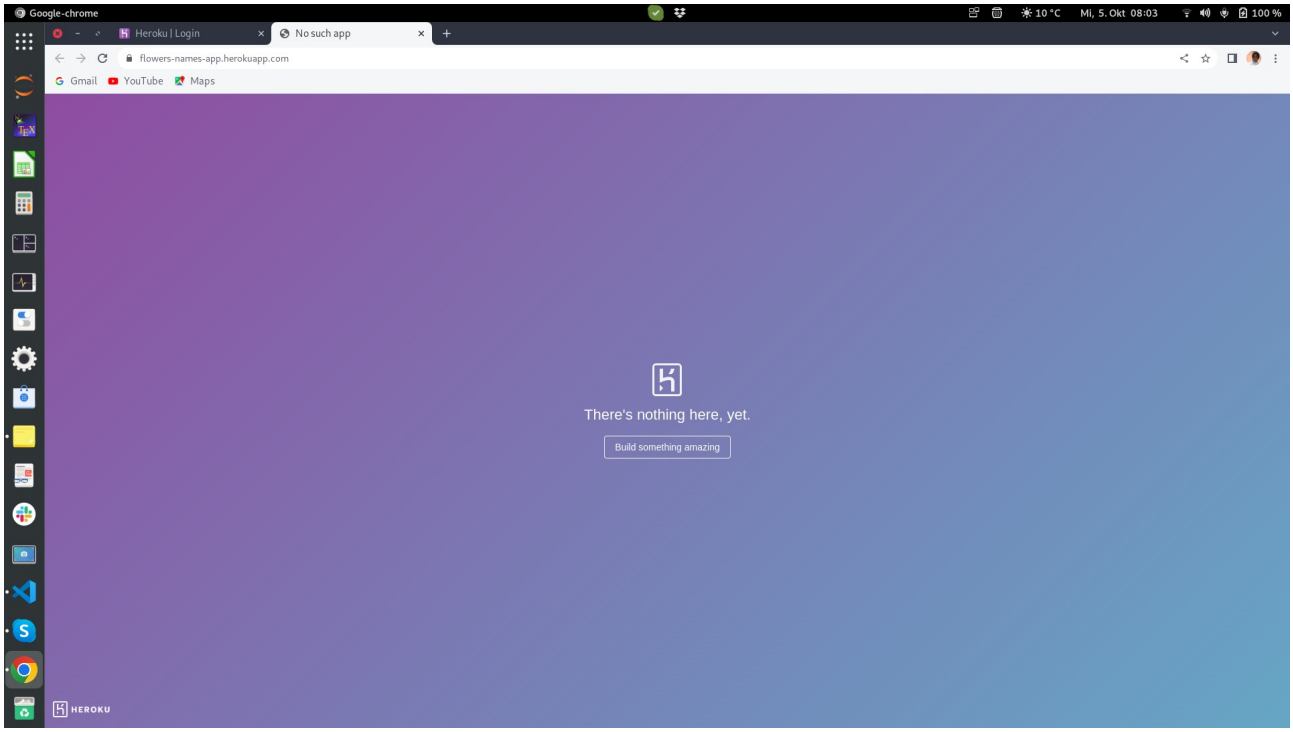
```
wilfried@tati-20vd:~/Downloads/Tati/data glacier virtual/Data-Glacier/week4$ heroku login
 ›   Warning: Our terms of service have changed:
 ›   https://dashboard.heroku.com/terms-of-service
heroku: Press any key to open up the browser to login or q to exit:
Opening browser to https://cli-auth.heroku.com/auth/cli/browser/1c0aefe5-a514-46b0-b02d-fd2c3ba8ea16?requestor=SFMyN
TY.g2gDbQAAAA4xNTguMTgxLjcwLjE2MG4GAEDATqSDAWIAAVGA.spoFdB96XC4sRbmasbwq94BvyOY6gyixs5P0sVaw3gQ
Logging in... done
Logged in as moteutatiana@gmail.com
```

- After logging in we create a file named `Procfile` in the project's root directory. This file tells Heroku how to run the app. You can create it by running the following command: *`echo "web: gunicorn app:app" > Procfile`*

- We install Gunicorn and update `requirements.txt` to contain the list of all dependencies. In the next step we commit them to git using the following command:

```
git add Procfile requirements.txt
git commit -m "Add Heroku deployment files"
```

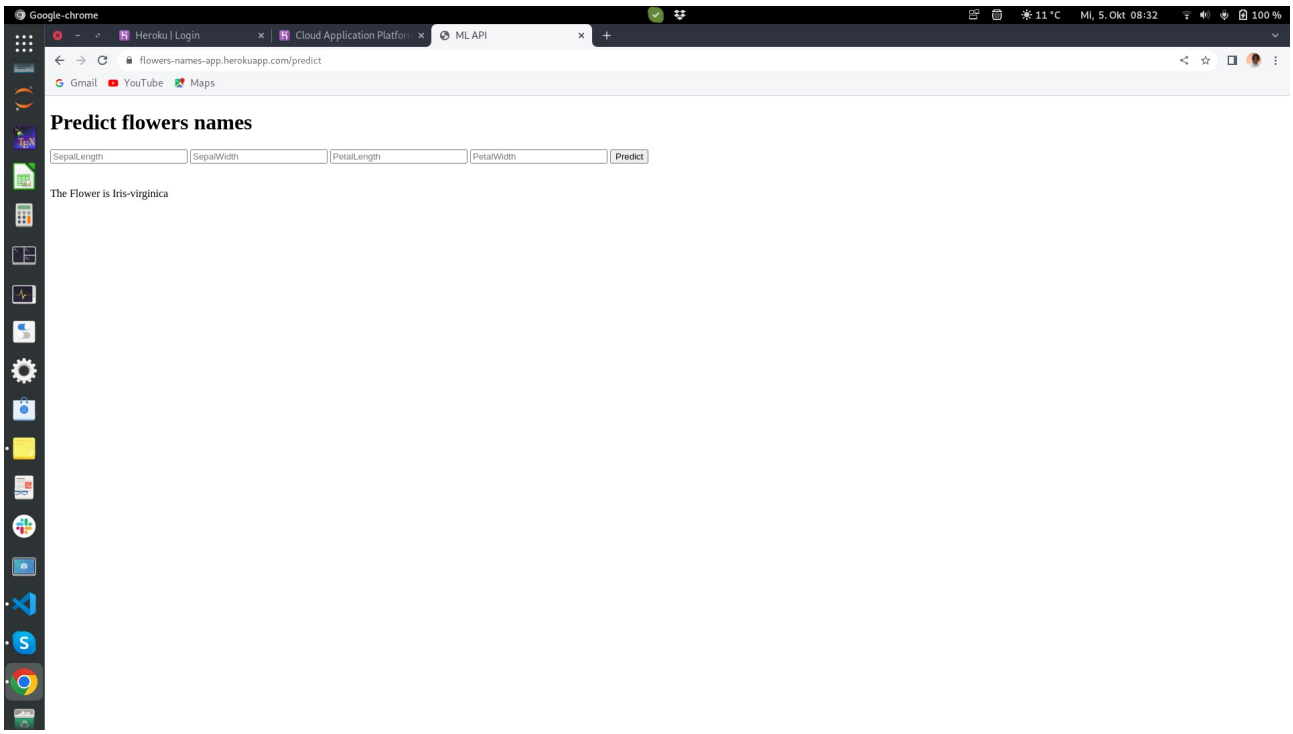
- Now we are ready to deploy the application to Heroku. To create the application in Heroku, we run the command : **heroku create flowers-names-app.** For this deployment the URL is https://flowers-names-app.herokuapp.com/



- Next, we push the Git repository to this remote to trigger the building and deployment process: *git push heroku main*

```
remote:          Downloading itsdangerous-2.1.2-py3-none-any.whl (15 kB)
remote:        Collecting Jinja2==3.1.2
remote:          Downloading Jinja2-3.1.2-py3-none-any.whl (133 kB)
remote:        Collecting joblib==1.2.0
remote:          Downloading joblib-1.2.0-py3-none-any.whl (297 kB)
remote:        Collecting kiwisolver==1.4.4
remote:          Downloading kiwisolver-1.4.4-cp310-cp310-manylinux_2_12_x86_64.manylinux2010_x86_64.whl (1.6 MB)
remote:        Collecting MarkupSafe==2.1.1
remote:          Downloading MarkupSafe-2.1.1-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (25 kB)
remote:        Collecting matplotlib==3.6.0
remote:          Downloading matplotlib-3.6.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (11.8 MB)
remote:        Collecting numpy==1.23.3
remote:          Downloading numpy-1.23.3-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (17.1 MB)
remote:        Collecting packaging==21.3
remote:          Downloading packaging-21.3-py3-none-any.whl (40 kB)
remote:        Collecting Pillow==9.2.0
remote:          Downloading Pillow-9.2.0-cp310-cp310-manylinux_2_28_x86_64.whl (3.2 MB)
remote:        Collecting pyparsing==3.0.9
remote:          Downloading pyparsing-3.0.9-py3-none-any.whl (98 kB)
remote:        Collecting python-dateutil==2.8.2
remote:          Downloading python_dateutil-2.8.2-py2.py3-none-any.whl (247 kB)
remote:        Collecting scikit-learn==1.1.2
remote:          Downloading scikit_learn-1.1.2-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (30.5 MB)
remote:        Collecting scipy==1.9.1
remote:          Downloading scipy-1.9.1-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (43.9 MB)
remote:        Collecting six==1.16.0
remote:          Downloading six-1.16.0-py2.py3-none-any.whl (11 kB)
remote:        Collecting threadpoolctl==3.1.0
remote:          Downloading threadpoolctl-3.1.0-py3-none-any.whl (14 kB)
remote:        Collecting Werkzeug==2.2.2
remote:          Downloading Werkzeug-2.2.2-py3-none-any.whl (232 kB)
remote:        Installing collected packages: threadpoolctl, six, pyparsing, Pillow, numpy, MarkupSafe, kiwisolver,
joblib, itsdangerous, gunicorn, fonttools, cycler, click, Werkzeug, scipy, python-dateutil, packaging, Jinja2, conto
urpy, scikit-learn, matplotlib, Flask
remote:        Successfully installed Flask-2.1.0 Jinja2-3.1.2 MarkupSafe-2.1.1 Pillow-9.2.0 Werkzeug-2.2.2 click-8.
1.3 contourpy-1.0.5 cycler-0.11.0 fonttools-4.37.4 gunicorn-20.0.4 itsdangerous-2.1.2 joblib-1.2.0 kiwisolver-1.4.4
matplotlib-3.6.0 numpy-1.23.3 packaging-21.3 pyparsing-3.0.9 python-dateutil-2.8.2 scikit-learn-1.1.2 scipy-1.9.1 si
x-1.16.0 threadpoolctl-3.1.0
remote: -----> Discovering process types
remote:        Procfile declares types -> web
remote:
remote: -----> Compressing...
remote:        Done: 139M
remote: -----> Launching...
remote:        Released v6
remote:        https://flowers-names-app.herokuapp.com/ deployed to Heroku
remote:
remote: Starting November 28th, 2022, free Heroku Dynos, free Heroku Postgres, and free Heroku Data for Redis® will
no longer be available.
remote:
remote: If you have apps using any of these resources, you must upgrade to paid plans by this date to ensure your ap
ps continue to run and to retain your data. For students, we will announce a new program by the end of September. Le
arn more at https://blog.heroku.com/next-chapter
remote:
remote: Verifying deploy... done.
To https://git.heroku.com/flowers-names-app.git
   b9e9023..607fe76  main -> main
```

The deployment on the web page is showed in the image below:


Google-chrome
11 °C
Mi, 5. Okt 08:32
100 %
Heroku | Login
Cloud Application Platform
ML API
flowers-names-app.herokuapp.com/predict
Gmail
YouTube
Maps
Predict flowers names
SepalLength
SepalWidth
PetalLength
PetalWidth
Predict
The Flower is Iris-virginica