# How to Run a Flask Application

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The backend server Flask was created fully in Python. It is a framework made up of Python modules and packages. With its characteristics, it is a lightweight Flask application that speeds up the development of backend apps. We will learn how to execute a Flask application in this tutorial.

## Run Flask application Syntax

We can run the Flask application using the below command.

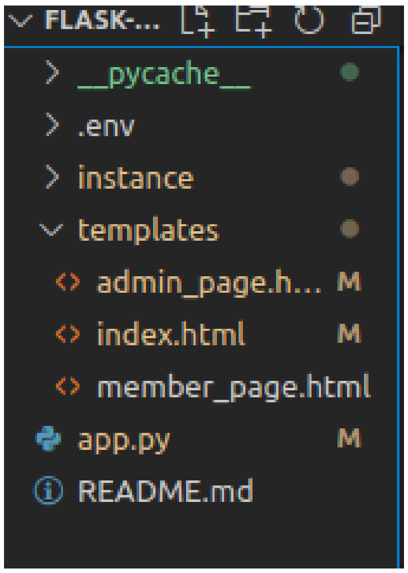
*flask –app <hello> run*

*flask run*

*python <app_name>.py*

## File Structure

Here, we are using the following folder and file.



```
FLASK-...
  > __pycache__
  > .env
  > instance
  v templates
      admin_page.h...  M
      index.html       M
      member_page.html
    app.py             M
    README.md
```

## Run a Flask Application

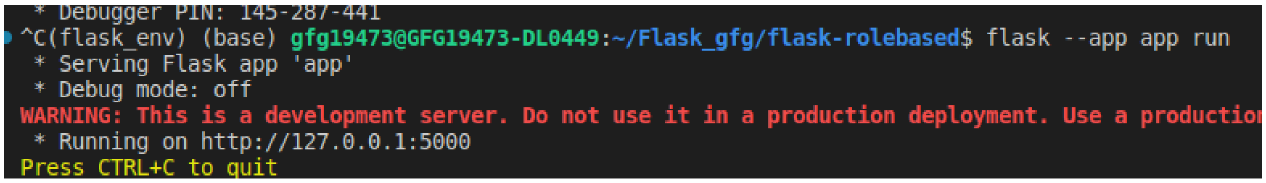
In this example, we have an application called **helloworld.py** below is the basic code for Flask.

Python

```python
# import flast module
from flask import Flask

# instance of flask application
app = Flask(__name__)

# home route that returns below text when root url is accessed
@app.route("/")
def hello_world():
    return "<p>Hello, World!</p>"

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

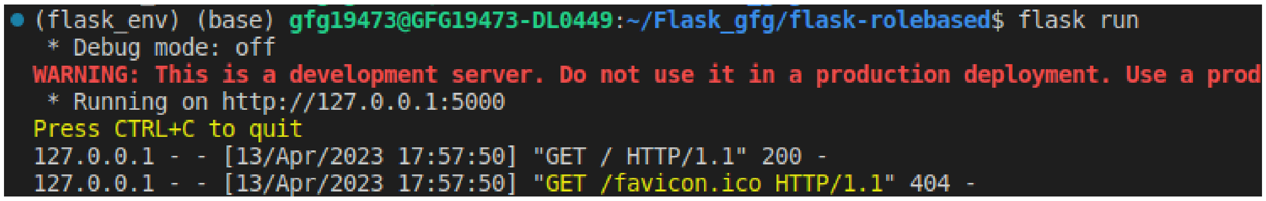
**Output:**

Using **flask –app <app_name> run**



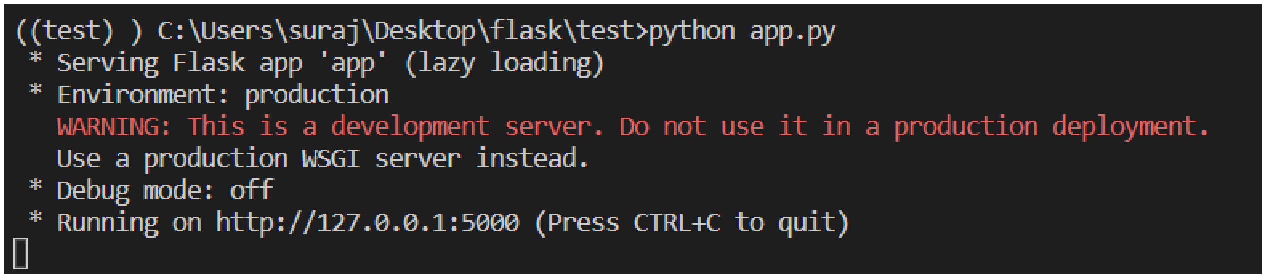
```
  * Debugger PIN: 145-287-441
^C(flask_env) (base) gfg19473@GFG19473-DL0449:~/Flask_gfg/flask-rolebased$ flask --app app run
  * Serving Flask app 'app'
  * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a productio
  * Running on http://127.0.0.1:5000
Press CTRL+C to quit
```

Using **flask run**

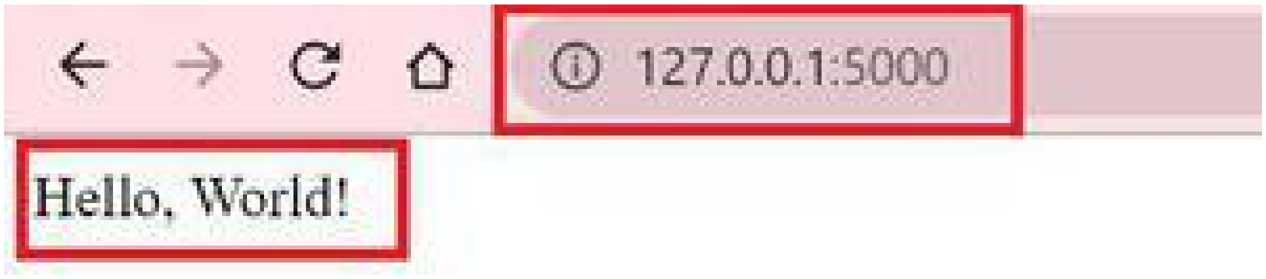


```
 (flask_env) (base) gfg19473@GFG19473-DL0449:~/Flask_gfg/flask-rolebased$ flask run
  * Debug mode: off
 WARNING: This is a development server. Do not use it in a production deployment. Use a prod
  * Running on http://127.0.0.1:5000
 Press CTRL+C to quit
 127.0.0.1 - - [13/Apr/2023 17:57:50] "GET / HTTP/1.1" 200 -
 127.0.0.1 - - [13/Apr/2023 17:57:50] "GET /favicon.ico HTTP/1.1" 404 -
```

Using the **python app_name.py**



```
((test) ) C:\Users\suraj\Desktop\flask\test>python app.py
 * Serving Flask app 'app' (lazy loading)
 * Environment: production
   WARNING: This is a development server. Do not use it in a production deployment.
   Use a production WSGI server instead.
 * Debug mode: off
 * Running on http://127.0.0.1:5000 (Press CTRL+C to quit)
```

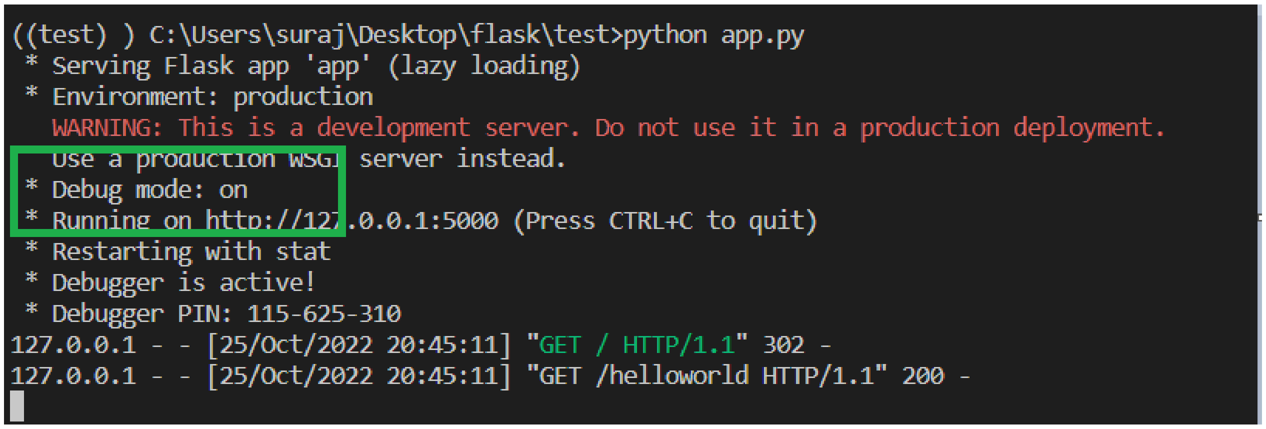


Hello, World!

## Run the app in the debugger

We will use the below command to run the flask application with debug mode as on. When debug mode is turned on, It allows developers to locate any possible error and as well the location of the error, by logging a traceback of the error.

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



```
((test) ) C:\Users\suraj\Desktop\flask\test>python app.py
 * Serving Flask app 'app' (lazy loading)
 * Environment: production
   WARNING: This is a development server. Do not use it in a production deployment.
   Use a production WSGI server instead.
 * Debug mode: on
 * Running on http://127.0.0.1:5000 (Press CTRL+C to quit)
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 115-625-310
127.0.0.1 - - [25/Oct/2022 20:45:11] "GET / HTTP/1.1" 302 -
127.0.0.1 - - [25/Oct/2022 20:45:11] "GET /helloworld HTTP/1.1" 200 -
```

## How to Run a Flask Application – FAQs

### How Do I Run a Production Flask App?

> *Running a Flask application in production involves setting up a more robust and secure server than the built-in development server provided*

*by Flask. Here are the steps to deploy a Flask app for production:*

1. ***Choose a WSGI Server**: For production, it's recommended to use a WSGI server like Gunicorn or uWSGI. These servers are designed to manage and handle requests in a production environment efficiently.**Example with Gunicorn (on Linux/Mac):***
    - `-w 4` *specifies four worker processes. Replace* `app:app` *with your Flask app's module and variable names.*

2. ***Use a Reverse Proxy**: Setting up a reverse proxy like Nginx or Apache in front of your WSGI server can enhance security and performance. The reverse proxy handles HTTP requests, serving static files, and directing other requests to the WSGI server.*
3. ***Configuration and Security**: Configure your server for security, such as setting up HTTPS using SSL/TLS, configuring firewalls, and ensuring all dependencies are up to date.*
4. ***Environment Variables**: Use environment variables to manage configuration settings and sensitive information, keeping them out of the codebase.*

```
pip install gunicorn
gunicorn -w 4 app:app
```

## How Do I Run Flask App in Windows Terminal?

*To run a Flask application in the Windows Terminal:*

1. ***Set Environment Variables**:*
2. ***Run the Flask Application**:*
    - *This command will start the Flask development server. Ensure your Flask script is named* `app.py`*, or change* `FLASK_APP` *to your script's name.*

```
set FLASK_APP=app.py
set FLASK_ENV=development
```

```
flask run
```

## How Do I Make My Flask App Executable?

*To make your Flask app executable, meaning creating a standalone application that can be run directly without explicitly running Python, you can use tools like PyInstaller:*

1. ***Install PyInstaller**:*
2. ***Create an Executable**:*
   - *`--onefile` tells PyInstaller to bundle your app and all its dependencies into a single executable. Replace `app.py` with the path to your Flask script.*
3. ***Run the Executable**: After PyInstaller completes, find your executable in the `dist` folder. You can run it directly, and it will start your Flask application.*

```
pip install pyinstaller
```

```
pyinstaller --onefile app.py
```

## How Do I Run Flask REST API?

*Running a Flask REST API is similar to running any Flask app but tailored towards handling API requests:*

1. ***Define Your Flask App**:*
2. ***Run Your Flask App**: In your command line (e.g., Windows Terminal), set the environment variables and start the server.*
   - *This starts your Flask REST API which can now respond to HTTP requests at the defined routes.*

```
from flask import Flask, jsonify
```

```
app = Flask(__name__)

@app.route('/api/data', methods=['GET'])
def get_data():
    data = {'key': 'value'}
    return jsonify(data)

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

```
set FLASK_APP=app.py
set FLASK_ENV=development
flask run
```

*These steps will help you manage both development and production setups for Flask applications, making your web applications more robust, secure, and efficient.*

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