1. Introduction

Chinese name: 杨志恒

English name:Gloria

ID: 2302520302028

```
C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

2. Setup the Flask App

cd01_2302520302028.py

```python
# English Name: Gloria
# Chinese Name: 杨志恒
# Student Number: 2302520302028


from flask import Flask

/
app = Flask(__name__)

# /test student_id  28
/test
@app.route("/test")
def test():
    return "okay"

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

```
C:\Users\OMEN>curl -X GET http://127.0.0.1:5000/test
okay
C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

3. /radius

3.1Here I test the Planets API endpoint with curl.

```
C:\Users\OMEN>curl -X GET "https://stevec.pythonanywhere.com/planets/surface-area/earth?units=miles"
{"area":196.89,"name":"earth"}

C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

3.2These screenshots show successfully calling the /planets/surface-area from my Flask app, and using curl to call my /radius endpoint, without changing the information.

cd01_2302520302028.py

```python

# English Name: Gloria
# Chinese Name: 杨志恒
# Student Number: 2302520302028

import requests
import math
from flask import Flask, request, jsonify


/
app = Flask(__name__)

/radius
@app.route( rule: '/radius', methods=["POST"])
def get_radius():
    data = request.get_json()
    planet = data.get("planet")
    response = requests.get(f"https://stevec.pythonanywhere.com/planets/surface-area/{planet}?units=miles")
    result = response.json()
    return result

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

```
C:\Users\OMEN>curl -X POST "http://127.0.0.1:5000/radius" -H "Content-Type: application/json" -d "{\"planet\":\"earth\"}
"
{
  "area": 196.89,
  "name": "earth"
}

C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

3.3Here I’ve added code to calculate the radius from the surface-area, and tested it using curl.

cd01_2302520302028.py

```python

# English Name: Gloria
# Chinese Name: 杨志恒
# Student Number: 2302520302028

import requests
import math
from flask import Flask, request, jsonify



/
app = Flask(__name__)

# /radius   "miles (post)"
/radius
@app.route( rule: "/radius", methods=["POST"])
def radius():
    planet = request.get_json()["planet"]
    url = f"https://stevec.pythonanywhere.com/planets/surface-area/{planet}?units=miles"
    area = requests.get(url).json()["area"]
    radius = math.sqrt(area * 1000000 / (4 * math.pi))
    return jsonify({"planet": planet, "radius": radius, "units": "miles"})

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

```
C:\Users\OMEN>curl -X POST http://127.0.0.1:5000/radius -H "Content-Type: application/json" -d "{\"planet\": \"earth\"}"

{
  "planet": "earth",
  "radius": 3958.283513428723,
  "units": "miles"
}

C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

4. /distance

4.1Here I test the Planets API endpoint with curl.

```
C:\Users\OMEN>curl -X POST "https://stevec.pythonanywhere.com/planets/average-distance/earth" -H "Content-Type: applicat
ion/json" -d "{\"units\": \"miles\"}"
{"distance":92.96,"name":"earth","units":"miles"}

C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

4.2These screenshots show successfully calling the `/planets/average-distance` from my Flask app, and using curl to call my /radius endpoint, without changing the information.

cd01_2302520302028.py

```python

# English Name: Gloria
# Chinese Name: 杨志恒
# Student Number: 2302520302028

import requests
import math
from flask import Flask, request, jsonify


/
app = Flask(__name__)

/distance/{planet}
@app.route( rule: "/distance/<planet>", methods=["GET"])
def distance(planet):
    url = f"https://stevec.pythonanywhere.com/planets/average-distance/{planet}"
    distance_response = requests.post(url, json={"units": "miles"})
    return distance_response.json()

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

```
C:\Users\OMEN>curl -X GET http://127.0.0.1:5000/distance/earth
{
  "distance": 92.96,
  "name": "earth",
  "units": "miles"
}

C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

4.3Here I’ ve added code to calculate the distance from the average-distance, and tested it using curl.

cd01_2302520302028.py

```python

# English Name: Gloria
# Chinese Name: 杨志恒
# Student Number: 2302520302028

import requests
import math
from flask import Flask, request, jsonify


/
app = Flask(__name__)

# /distance "miles (route)"
/distance/{planet}
@app.route( rule: "/distance/<planet>", methods=["GET"])
def distance(planet):
    url = f"https://stevec.pythonanywhere.com/planets/average-distance/{planet}"
    distance = requests.post(url, json={"units": "miles"}).json()["distance"]
    distance_au = distance / 92.9558
    return jsonify({"planet": planet, "distance": distance_au, "units": "AU"})

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

```
C:\Users\OMEN>curl -X GET http://127.0.0.1:5000/distance/earth
{
  "distance": 1.0000451827642816,
  "planet": "earth",
  "units": "AU"
}

C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

5. /tilt

5.1Here I test the Planets API endpoint with curl.

```
C:\Users\OMEN>curl -X POST "https://stevec.pythonanywhere.com/planets/axial-tilt/earth" -H "Content-Type: application/json" -d "{\"units\": \"degrees\"}"
{"name":"earth","tilt":23.44,"units":"degrees"}

C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

5.2These screenshots show successfully calling the `/planets/axial-tilt` from my Flask app, and using curl to call my /radius endpoint, without changing the information.

cd01_2302520302028.py

```python

# English Name: Gloria
# Chinese Name: 杨志恒
# Student Number: 2302520302028

import requests
import math
from flask import Flask, request, jsonify


/
app = Flask(__name__)


/tilt
@app.route( rule: "/tilt", methods=["GET"])
def tilt():
    planet = request.args.get("planet", None)
    url = f"https://stevec.pythonanywhere.com/planets/axial-tilt/{planet}"
    tilt_response = requests.post(url, json={"units": "degrees"})
    return tilt_response.json()

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

```
C:\Users\OMEN>curl -X GET "http://127.0.0.1:5000/tilt?planet=earth"
{
  "name": "earth",
  "tilt": 23.44,
  "units": "degrees"
}

C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

5.3Here I’ ve added code to calculate the tilt from the axial-tilt, and tested it using curl.

cd01_2302520302028.py

```python

# English Name: Gloria
# Chinese Name: 杨志恒
# Student Number: 2302520302028

import requests
import math
from flask import Flask, request, jsonify


/
app = Flask(__name__)

# /tilt "degrees (query)"
/tilt
@app.route( rule: "/tilt", methods=["GET"])
def tilt():
    planet = request.args.get("planet", None)
    url = f"https://stevec.pythonanywhere.com/planets/axial-tilt/{planet}"
    degrees = requests.post(url, json={"units": "degrees"}).json()["tilt"]
    radians = degrees * (math.pi / 180)
    return jsonify({"planet": planet, "tilt": radians, "units": "radians"})

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

```
C:\Users\OMEN>curl -X GET "http://127.0.0.1:5000/tilt?planet=earth"
{
  "planet": "earth",
  "tilt": 0.40910517666747087,
  "units": "radians"
}

C:\Users\OMEN>curl -X GET https://stevec.pythonanywhere.com/planets/assignment/28
{"distance":"miles (route)","radius":"miles (post)","student_id":28,"tilt":"degrees (query)"}
```

6. Deploy to PythonAnywhere

My username is sanqiqi7, so my app is deployed to https://sanqiqi7.pythonanywhere.com/

6.1 /radius

curl -X POST https://sanqiqi7.pythonanywhere.com/radius -H "Content-Type: application/json" -d "{\"planet\": \"earth\"}"

```
C:\Users\OMEN>curl -X POST https://sanqiqi7.pythonanywhere.com/radius -H "Content-Type: application/json" -d "{\"planet\
": \"earth\"}"
{"planet":"earth","radius":3958.283513428723,"units":"miles"}
```

6.2 /distance

curl -X GET https://sanqiqi7.pythonanywhere.com/distance/earth

```
C:\Users\OMEN>curl -X GET https://sanqiqi7.pythonanywhere.com/distance/earth
{"distance":1.0000451827642816,"planet":"earth","units":"AU"}
```

6.3 /tilt

curl -X GET "https://sanqiqi7.pythonanywhere.com/tilt?planet=earth"

```
C:\Users\OMEN>curl -X GET "https://sanqiqi7.pythonanywhere.com/tilt?planet=earth"
{"planet":"earth","tilt":0.40910517666747087,"units":"radians"}
```