1. Calculate Smallest Bounding Box

Endpoint: /smallest\_bounding\_box

Method: POST

Parameters:

points: List of 3D points represented as arrays [x, y, z].

Expected Output:

JSON object containing the minimum and maximum corners of the smallest bounding box:

json

{

"min\_corner": [x\_min, y\_min, z\_min],

"max\_corner": [x\_max, y\_max, z\_max]

}

2. Rotate Mesh

Endpoint: /rotate\_mesh

Method: POST

Parameters:

mesh: List of 3D points representing the mesh.

angle: Angle of rotation in degrees.

axis: Axis of rotation ('X', 'Y', or 'Z').

Expected Output:

JSON object containing the rotated mesh:

json

{

"mesh": [[x1, y1, z1], [x2, y2, z2], ...]

}

3. Move Mesh

Endpoint: /move\_mesh

Method: POST

Parameters:

mesh: List of 3D points representing the mesh.

x: Units to move along the X axis.

y: Units to move along the Y axis.

z: Units to move along the Z axis.

Expected Output:

JSON object containing the moved mesh:

json

{

"mesh": [[x1, y1, z1], [x2, y2, z2], ...]

}

4. Check Convex Polygon

Endpoint: /check\_convex\_polygon

Method: POST

Parameters:

points: List of 3D points representing the polygon.

Expected Output:

JSON object indicating whether the polygon is convex:

json

{

"is\_convex": true|false

}

**Instructions to Run the Service Locally**

Clone the Repository: Clone the repository containing the Flask application to your local machine. Here Just extract the zip file and get inside the assignment-1 folder.

Navigate to the Directory: Open your terminal or command prompt and navigate to the directory (assignment-1) where the Flask application is located.

Set Up Virtual Environment: If you haven't already set up a virtual environment, create one using virtualenv or venv:

* virtualenv venv

or

* python -m venv venv

Activate the Virtual Environment: Activate the virtual environment:

On Windows:

* venv\Scripts\activate

On macOS and Linux:

* source venv/bin/activate

Install Dependencies: Install Flask if you haven't already installed it:

* pip install -r requirements.txt

Run the Flask Application: Run the Flask application:

* python app.py

Access the Endpoints: Once the Flask application is running, you can access the endpoints using tools like Postman or by sending HTTP requests programmatically.  
  
To run the application if everything has been setup (running locally):

* In one terminal activate the virtual environment and run the geometry.py file as a simple python file. `python geometry.py`. This will start the flask server at localhost on port 5000(default).
* In another terminal, while the geometry file is running, run the test\_endpoints.py file to run the 4 tests.
* If you want to check the output separately, try the POSTMAN application or cmd itself to send the post method to the endpoints and get the output for your input.

To run the Docker container, Just run the following commands inside the directory

* `docker build -t flask-app .`
* `docker run -p 5000:5000 flask-app`