Sign up and create a Ubuntu virtual machine (B1s)

<https://azure.microsoft.com/en-gb/free/students/>

Setup - run the following commands

sudo apt update

sudo  apt -y upgrade

sudo apt -y install python3-pip

sudo apt -y install python3-flask

mkdir venv

cd venv

sudo apt -y install python3.12-venv

python3 -m venv .

#Create a repository in GitHub

#Add a file hello.py to the repo on GitHub

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hello.py

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from flask import Flask  
app = Flask(\_\_name\_\_)  
@app.route("/")#URL leading to method  
def hello(): # Name of the method  
 return("Hello World!") #indent this line  
if \_\_name\_\_ == "\_\_main\_\_":  
 app.run(host='0.0.0.0', port='8080') # indent this line

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#Click commit to main

#Click code

#Copy the .git link

#git clone <repo link> # it will say cloning into <X>

cd <X>

run:

python3 hello.py  
#ensure port 8080 is open on portal.azure.com

then in Chrome, visit http://<IP>:8080

you should see

Hello World!

#Returning to terminal, run:

#Let's get Flask running on https:  
#run

sudo apt -y install apache2  
sudo snap install --classic certbot

sudo ln -s /snap/bin/certbot /usr/bin/certbot

#make sure you have configured you DNS (hostname) on Azure

sudo certbot --apache

sudo cp /etc/letsencrypt/live/<hostname>/cert.pem .

sudo cp /etc/letsencrypt/live/<hostname>/privkey.pem .

sudo chown `whoami` \*.pem

#edit hello.py on GitHub   
change the last line to:  
  
app.run(host='0.0.0.0',port='8080', ssl\_context=('cert.pem', 'privkey.pem')) #Run the flask app at port 8080  
  
run

python3 hello.py # http:// avinash.uksouth.cloudapp.azure.com:8080  
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#Let's get some parameters:  
#Create file greeting.py on GitHub as follows:

from flask import Flask  
from flask import request  
app = Flask(\_\_name\_\_)  
@app.route("/")#URL leading to method  
def hello(): # Name of the method  
 return("Hello World!")  
@app.route("/greetme")#different URL  
def helloall(): # different method name  
 name = request.args.get('name')#retrieve GET parameters  
 return("Hello {}!".format(name))#Python’s string.format  
if \_\_name\_\_ == "\_\_main\_\_":  
 app.run(host='0.0.0.0',port='8080', ssl\_context=('cert.pem', 'privkey.pem')) #Run the flask app at port 8080

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python3 greeting.py

Test with [https://yourdomain:8080/greetme?name=yourname](https://yourdomain.dbsprojects.ie:8080/greetme?name=yourname)

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set up DB unless already done

sudo apt -y install mariadb-server mariadb-client

../bin/pip3 install flask\_cors mysql-connector-python

sudo mysql

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CREATE USER 'web'@'localhost' IDENTIFIED BY 'webPass';  
GRANT ALL PRIVILEGES ON \*.\* to 'web'@'localhost';

CREATE DATABASE student;   
USE student;  
CREATE TABLE students (studentName VARCHAR(255), email VARCHAR(255), studentID INT NOT NULL AUTO\_INCREMENT,  
PRIMARY KEY(studentID));

INSERT INTO students (studentName, email) values ("first student", "firststudent@mydbs.ie");   
INSERT INTO students (studentName, email) values ("second student", "secondstudent@mydbs.ie ");  
SELECT \* FROM students;  
exit;

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Now to set up the API

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#On GitHub, create templates/add.html

<!DOCTYPE html>

<html>

<head>

<meta charset="utf-8">

<meta name="viewport" content="width=device-width">

<title>Add Item</title>

</head>

<body>

  <form action="/add" method="POST">

    Name: <input type="text", name="name">

    Email: <input type="text", name="email">

    <button type="submit" name="submit">Add</button>

  </form>

</body>

</html>

#On GitHub, create app.py

#paste:

from flask import Flask

from flask import render\_template

from flask import request

import mysql.connector

from flask\_cors import CORS

import json

mysql = mysql.connector.connect(user='web', password='webPass',

  host='127.0.0.1',

  database='student')

from logging.config import dictConfig

dictConfig({

    'version': 1,

    'formatters': {'default': {

        'format': '[%(asctime)s] %(levelname)s in %(module)s: %(message)s',

    }},

    'handlers': {'wsgi': {

        'class': 'logging.StreamHandler',

        'stream': 'ext://flask.logging.wsgi\_errors\_stream',

        'formatter': 'default'

    }},

    'root': {

        'level': 'INFO',

        'handlers': ['wsgi']

    }

})

app = Flask(\_\_name\_\_)

CORS(app)

# My SQL Instance configurations

# Change the HOST IP and Password to match your instance configurations

@app.route("/add", methods=['GET', 'POST']) #Add Student

def add():

  if request.method == 'POST':

    name = request.form['name']

    email = request.form['email']

    print(name,email)

    cur = mysql.cursor() #create a connection to the SQL instance

    s='''INSERT INTO students(studentName, email) VALUES('{}','{}');'''.format(name,email)

    app.logger.info(s)

    cur.execute(s)

    mysql.commit()

  else:

    return render\_template('add.html')

  return '{"Result":"Success"}'

@app.route("/") #Default - Show Data

def hello(): # Name of the method

  cur = mysql.cursor() #create a connection to the SQL instance

  cur.execute('''SELECT \* FROM students''') # execute an SQL statment

  rv = cur.fetchall() #Retreive all rows returend by the SQL statment

  Results=[]

  for row in rv: #Format the Output Results and add to return string

    Result={}

    Result['Name']=row[0].replace('\n',' ')

    Result['Email']=row[1]

    Result['ID']=row[2]

    Results.append(Result)

  response={'Results':Results, 'count':len(Results)}

  ret=app.response\_class(

    response=json.dumps(response),

    status=200,

    mimetype='application/json'

  )

  return ret #Return the data in a string format

if \_\_name\_\_ == "\_\_main\_\_":

  #app.run(host='0.0.0.0',port='8080') #Run the flask app at port 8080

  app.run(host='0.0.0.0',port='8080', ssl\_context=('cert.pem', 'privkey.pem')) #Run the flask app at port 8080

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../bin/python3 app.py # from inside the repository

Let's try a JS client in the browser

sudo nano /var/www/html/index.html

<!DOCTYPE html>  
<html>  
<head>  
<meta charset="utf-8">  
<meta name="viewport" content="width=device-width">  
<title>Test API Client</title>  
<script>  
let doIt=()=>{  
  let tab=document.getElementById("tab1");  
  let rows=tab1.getElementsByTagName('tr');  
  fetch('[https://<yourdomain>:8080/'](https://dspaul.dbsprojects.ie:8080/'))  
    .then(response => response.json())  
    .then(data=>data.Results.forEach(  //.slice(0,3)  
      x=>{  
        let newRow=rows[0].cloneNode(true);  
        let divs=newRow.getElementsByTagName('td');  
        divs[0].innerHTML=x['ID'];  
        divs[1].innerHTML=x['Name'];  
        divs[2].innerHTML=x['Email'];  
        tab1.appendChild(newRow);  
      }  
    )  
  );  
}  
</script>  
</head>  
<body>  
<button onClick="doIt()">Press me</button>  
This is where the results turn up: <br/>  
<table id='tab1' bgcolor='blue'>  
<tr><td>ID</td><td>Name</td><td>Email</td></tr>  
</table></body>  
</html>

now visit your domain