

Họ Và Tên: Dương Văn Ninh

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## Bài làm

**B1:** Em tạo sử dụng python để tạo fasapi trên visual studio code. Sẽ lấy 2 giá trị temperature và humidity ngẫu nhiên bằng hàm random

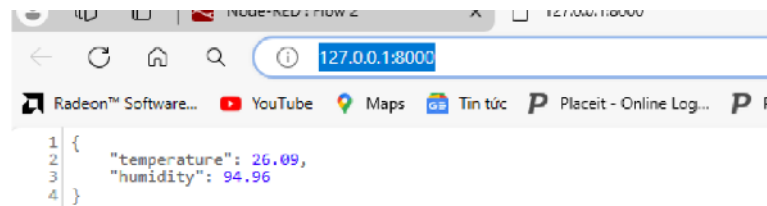
- Temperature random từ 25 -> 30
- Humidity random từ 85 -> 90

```
1  from fastapi import FastAPI
2  import random
3
4  app = FastAPI()
5  def generate_random_temperature():
6
7      return round(random.uniform(25, 30), 2)
8
9  def generate_random_humidity():
10
11      return round(random.uniform(80, 95), 2)
12
13  @app.get("/")
14  async def read_data():
15
16      temperature = generate_random_temperature()
17      humidity = generate_random_humidity()
18      return {"temperature": temperature, "humidity": humidity}
```

- Sau đó chạy fasapi bằng lệnh : **uvicorn main:app --reload**
- Có thể cấu hình port: **uvicorn main:app --port 5000**

```
PS D:\tai lieu hoc tap\laptrinhpython> uvicorn main:app --reload
INFO: Will watch for changes in these directories: ['D:\\tai lieu hoc tap\\laptrinhpython']
INFO: Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)
INFO: Started reloader process [23348] using WatchFiles
INFO: Started server process [11276]
INFO: Waiting for application startup.
INFO: Application startup complete.
```

- Sau đó sẽ trả về chuỗi Json:



```
1 {
2   "temperature": 26.09,
3   "humidity": 94.96
4 }
```

- Mỗi lần F5 sẽ gọi lại sẽ trả về các giá trị ramdom trong khoảng đã được đặt trước

```
INFO: 127.0.0.1:59276 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59281 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59286 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59288 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59293 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59295 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59302 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59305 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59310 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59314 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:59316 - "GET / HTTP/1.1" 200 OK
```

## B2: Chạy Node-red

```
node-red
14 May 21:08:04 - [info] Node-RED version: v3.1.9
14 May 21:08:04 - [info] Node.js version: v20.13.1
14 May 21:08:04 - [info] Windows_NT 10.0.22621 x64 LE
14 May 21:08:06 - [info] Loading palette nodes
14 May 21:08:23 - [info] Settings file : C:\Users\ADMIN\.node-red\settings.js
14 May 21:08:23 - [info] Context store : 'default' [module=memory]
14 May 21:08:23 - [info] User directory : \Users\ADMIN\.node-red
14 May 21:08:23 - [warn] Projects disabled : editorTheme.projects.enabled=false
14 May 21:08:23 - [info] Flows file : \Users\ADMIN\.node-red\flows.json
14 May 21:08:23 - [warn]

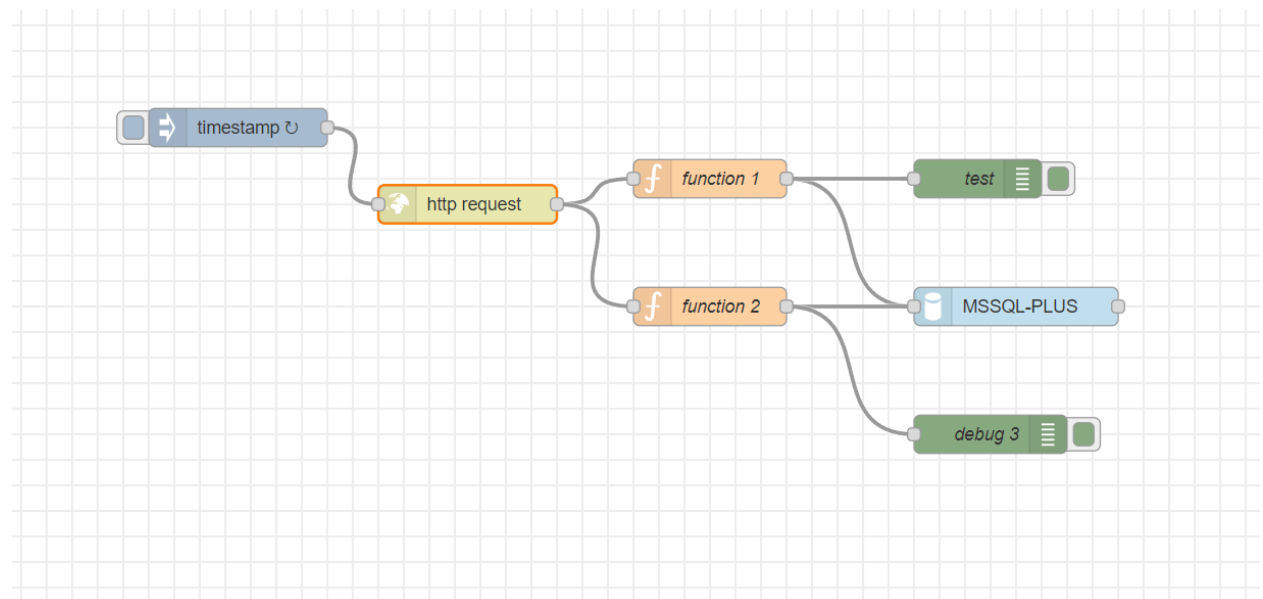
-----
Your flow credentials file is encrypted using a system-generated key.

If the system-generated key is lost for any reason, your credentials
file will not be recoverable, you will have to delete it and re-enter
your credentials.

You should set your own key using the 'credentialSecret' option in
your settings file. Node-RED will then re-encrypt your credentials
file using your chosen key the next time you deploy a change.
-----

14 May 21:08:23 - [info] Starting flows
14 May 21:08:23 - [info] Started flows
14 May 21:08:23 - [info] Server now running at http://127.0.0.1:1880/
14 May 21:08:33 - [error] [http request:4285c7a79a9f94d5] RequestError: connect ECONNREFUSED 127.0.0.1:8500
14 May 21:08:33 - [error] [function:function 2] SyntaxError: Unexpected token 'R', "RequestErr"... is not valid JSON
14 May 21:08:33 - [error] [function:function 3] SyntaxError: Unexpected token 'R', "RequestErr"... is not valid JSON
```

- Cổng của chạy thường là: **127.0.0.1:1880**
- Tạo các function để lấy 2 giá trị từ fastapi: **temperature** và **humidity**



Kết nối với SQL:

Edit MSSQL node > **Edit MSSQL-CN node**

Delete

Cancel

Update

**Properties**

Name

test

Server

127.0.0.1

Port

1433

Username

sa

Password

.....

Domain

Database

test

TDS Version

7\_4 (SQL Server 2012 ~ 2022) ▾

Use Encryption? ☒

SQL Databases hosted on Azure will need this checked.

Trust Certificate? ☒

If unchecked, SQL Server will try to validate the server SSL certificate and will terminate the connection if validation fails

☐ Enabled 1

On all flows ▾

- Các function lấy dữ liệu và lưu vào database

5/14/2024, 10:37:14 PM	node: debug 7	msg.payload : undefined	undefined
5/14/2024, 10:37:17 PM	node: debug 10	msg.payload : string[50]	"INSERT INTO history(sid, value) VALUES('2', 91.89)"
5/14/2024, 10:37:17 PM	node: debug 9	msg.payload : undefined	undefined
5/14/2024, 10:37:29 PM	node: debug 8	msg.payload : string[51]	"INSERT INTO history (sid, value) VALUES ('1',28.47)"
5/14/2024, 10:37:29 PM	node: debug 7	msg.payload : undefined	undefined
5/14/2024, 10:37:30 PM	node: debug 10	msg.payload : string[50]	"INSERT INTO history(sid, value) VALUES('2', 85.83)"
5/14/2024, 10:37:31 PM	node: debug 9	msg.payload : undefined	undefined
5/14/2024, 10:37:41 PM	node: debug 10	msg.payload : string[50]	"INSERT INTO history(sid, value) VALUES('2', 81.67)"
5/14/2024, 10:37:41 PM	node: debug 9	msg.payload : undefined	undefined

### B3: Làm Trên SQL

Tạo 2 bảng là sensor và History để lưu dữ liệu:

DESKTOP-4TQI2HI\S....test - dbo.sensor		DESKTOP-4TQI2HI\S...test - dbo.History	
	Column Name	Data Type	Allow Nulls
PK	sid	nvarchar(50)	<input type="checkbox"/>
	name	nvarchar(50)	<input checked="" type="checkbox"/>
	unit	nvarchar(50)	<input checked="" type="checkbox"/>
	value	decimal(18, 2)	<input checked="" type="checkbox"/>
	time	datetime	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

DESKTOP-4TQI2HI\S....test - dbo.sensor		DESKTOP-4TQI2HI\S...test - dbo.History	
	Column Name	Data Type	Allow Nulls
PK	id	int	<input type="checkbox"/>
	sid	nvarchar(50)	<input type="checkbox"/>
	value	nvarchar(50)	<input checked="" type="checkbox"/>
	time	datetime	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

- Liên kết khóa của bảng sensor (sid) với History (sid).

Vì em viết lệnh lấy và lưu dữ liệu trên function của Node-red rồi nên em không tạo SP\_ trên SQL nữa.

Các giá trị được lưu vào trong SQL trong bảng History:

	id	sid	value	time
▶	1	1	3	2024-04-03 00:0...
	7	1	28	2024-05-14 14:5...
	8	1	27	2024-05-14 14:5...
	9	2	85	2024-05-14 15:0...
	10	2	93	2024-05-14 15:1...
	11	2	88	2024-05-14 15:1...
	12	2	91	2024-05-14 15:1...
	13	2	87	2024-05-14 15:2...
	14	1	28	2024-05-14 15:2...
	15	2	91	2024-05-14 15:2...
	16	1	30	2024-05-14 15:2...
	17	2	84	2024-05-14 15:2...
	18	1	29	2024-05-14 15:2...
	19	2	95	2024-05-14 15:2...
	20	2	95	2024-05-14 15:2...
	21	1	25	2024-05-14 15:2...
	22	2	83	2024-05-14 15:2...
	23	1	28	2024-05-14 15:2...
	24	2	86	2024-05-14 15:2...
	25	1	29	2024-05-14 15:2...
	26	2	90	2024-05-14 15:2...
	27	1	27	2024-05-14 15:2...
	28	2	93	2024-05-14 15:2...
	29	1	26	2024-05-14 15:2...
	30	2	92	2024-05-14 15:2...
	31	2	87	2024-05-14 15:2...
	32	1	25	2024-05-14 15:2...
	33	2	92	2024-05-14 15:2...
	34	1	29	2024-05-14 15:2...
	35	2	86	2024-05-14 15:2...

Tạo Sp\_Chart để tí nữa vẽ biểu đồ:

```
SQLQuery5.sql - DES...RESS.test (sa (64))  SQLQuery4.sql - DES...RESS.test (sa (75))  SQLQuery3.sql - DES...RESS.test (sa (72))  DESKTOP-4TQI2HI\S...test - dbo.sensor

USE [test]
GO
/***** Object:  StoredProcedure [dbo].[SP_Chart]    Script Date: 5/14/2024 11:05:28 PM *****/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER PROCEDURE [dbo].[SP_Chart]
AS
BEGIN
    DECLARE @json nvarchar(max) = N'{"ok":1,"msg":"ok","data":[';

    SELECT @json += FORMATMESSAGE(N'{"id": "%d", "sid": "%d", "value": "%s", "time": "%s"}',
                                   [id], [sid], CONVERT(nvarchar(50), [value]), CONVERT(nvarchar(50), [time]))
    FROM history;

    IF RIGHT(@json, 1) = ','
    BEGIN
        SET @json = LEFT(@json, LEN(@json) - 1);
    END

    SET @json = @json + ']]';

    SELECT @json AS json;
END
```

**B4:** Tạo 1 chuỗi kết nối đến database trên SQL

```
api.aspx.cs  api.aspx  index.html
web_randomdata  api  Page_Load(object sender, EventArgs e)

4  using System.Web.UI;
5  using System.Data.SqlClient;
6  using System.Data;
7
8  namespace S6kmt
9  {
10     public partial class api : System.Web.UI.Page
11     {
12         protected void Page_Load(object sender, EventArgs e)
13         {
14             string connectionString = "Data Source=DESKTOP-4TQI2HI\\SQLEXPRESS;Initial Catalog=test;Integrated Security=True;";
15             using (SqlConnection connection = new SqlConnection(connectionString))
16             {
17                 using (SqlCommand command = (local variable) SqlConnection connection connection)
18                 {
19                     command.CommandType = CommandType.StoredProcedure;
20
21                     try
22                     {
23                         connection.Open();
24                         object kq = command.ExecuteScalar();
25                         string json = (string)kq;
26                         this.Response.ContentType = "application/json";
27                         this.Response.Write(json);
28                     }
29                     catch (Exception ex)
30                     {
31                         this.Response.ContentType = "application/json";
32                     }
33                 }
34             }
35         }
36     }
37 }
```

Đổi chuỗi kết nối:

```
string connectionString = "Data Source=DESKTOP-4TQI2HI\\SQLEXPRESS;Initial Catalog=test;Integrated Security=True";
```



Tạo 2 file html và js để vẽ biểu đồ:

