Azure Cloud Exercises

Exercise 1: Create and Configure a Virtual Machine

Objective: Create and configure Ubuntu and Windows Virtual Machines on Azure Portal.

1. Create an Ubuntu VM:

- Log in to the Azure Portal.
- Navigate to Virtual Machines > Create.
- Choose Ubuntu Server 20.04 LTS.
- Configure:
  - Size: Standard_B1s (or similar)
  - Authentication Type: SSH (generate a key pair if not available).
  - Inbound Port: Allow SSH (port 22).
- Deploy and connect using SSH.

2. Create a Windows VM:

- Follow similar steps, selecting Windows Server 2022.
- Configure:
  - Size: Standard_B1s (or similar)
  - Authentication Type: Username and Password.
  - Inbound Port: Allow RDP (port 3389).
- Deploy and connect using RDP.

3. Task:

- Install Apache or IIS on the respective VMs.
- Verify by accessing the default web page from your local browser.


Apache2 Default Page
Ubuntu
It works!
This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should replace this file (located at /var/www/html/index.html) before continuing to operate your HTTP server.
If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.
Configuration Overview
Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is fully documented in /usr/share/doc/apache2/README.Debian.gz. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the manual if the apache2-doc package was installed on this server.
The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:
/etc/apache2/
|-- apache2.conf
| `-- ports.conf
|-- mods-enabled
| |-- *.load
| `-- *.conf
|-- conf-enabled
| `-- *.conf
|-- sites-enabled
| `-- *.conf
apache2.conf is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.
ports.conf is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
Configuration files in the mods-enabled/, conf-enabled/ and sites-enabled/ directories contain particular configuration snippets which manage modules, global configuration fragments, or virtual host configurations, respectively.
They are activated by symlinking available configuration files from their respective *-available/ counterparts. These should be managed by using our helpers a2enmod, a2dismod, a2ensite, a2dissite, and a2enconf, a2disconf . See their respective man pages for detailed information.
The binary is called apache2 and is managed using systemd, so to start/stop the service use systemctl start apache2 and systemctl stop apache2, and use systemctl status apache2 and journalctl -u apache2 to check status. system and apache2ctl can also be used for service

It works!

Exercise 2: Deploy a Static Web Application

Objective: Host a static website using Azure App Service.

1. Navigate to App Services > Create.

2. Choose:

- Runtime Stack: Python 3.10 (or latest).
- Operating System: Linux.
- Region: Closest to your location.

3. Deploy the application.

4. Upload a simple static website (e.g., index.html and CSS files) using FTP or the Kudu console.

5. Task:

- Verify the deployment by accessing the site via its public URL.
- Modify the HTML to include a message like: "Welcome to Azure Static Web Apps!

Welcome to Azure Static Web Apps!

Exercise 3: Deploy a Flask Application (Dynamic Web App)

Objective: Deploy a Python Flask application using Azure App Service.

1. Create a Flask app:

```
from flask import Flask
app = Flask(__name__)
@app.route('/')
def home():
 return "Hello, Azure Flask App!"
if __name__ == '__main__':
 app.run(debug=True)
```

2. Push the code to a GitHub repository.

3. In the Azure Portal, navigate to App Services > Create.

4. Configure:

- Runtime Stack: Python 3.10 (or latest).
- Deployment Source: Connect your GitHub repository.

5. Deploy the Flask app and verify it by accessing the public URL

Exercise 4: Set Up and Use an Azure SQL Database

Objective: Create an Azure SQL Database and connect to it from your local machine.

1. Navigate to SQL Databases > Create.

2. Configure:

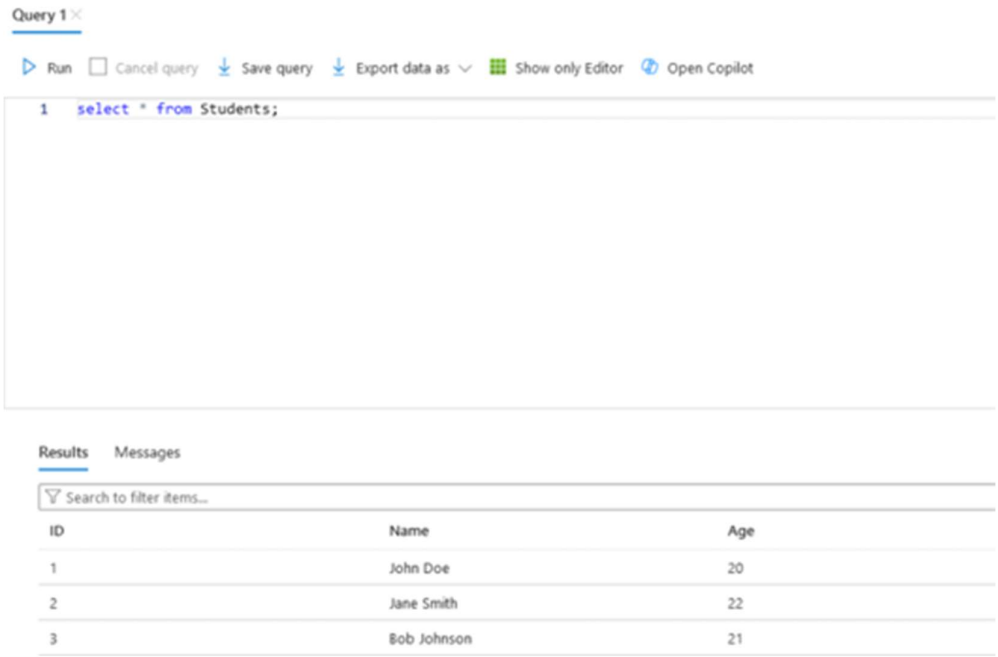
   - Database Name: StudentDB.
   - Server: Create a new server with username and password.
   - Compute + Storage: Use the free tier.

3. Deploy the database.

4. Connect using Azure Data Studio or SQL Server Management Studio (SSMS).

5. Task:

   - Create a table Students with columns ID, Name, and Age.
   - Insert sample data and query it.



Exercise 5: Integrate Flask App with Azure SQL Database

Objective: Connect a Flask app to Azure SQL Database and perform CRUD operations.

1. Use the Flask app from Exercise 3.

2. Install required libraries: pip install flask pyodbc

3. Modify the app to connect to the SQL Database:

```
import pyodbc
conn = pyodbc.connect(
        'DRIVER={ODBC Driver 17 for SQL Server};'
        'SERVER=<your_server>.database.windows.net;'
        'DATABASE=StudentDB;'
        'UID=<your_username>;'
        'PWD=<your_password>'
)
cursor = conn.cursor()
```

4. Add a route to fetch and display data from the Students table.

5. Deploy the updated app to Azure App Service.

6. Task: Verify CRUD functionality by interacting with the app via its public UR