

VSS Semester Project



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Submitted To: Mr. Majid Bashir

University: International Islamic University, Islamabad

Revision History

Name	Date	Project Description	Version
Haroon Allahdad	26 th , Oct 24	Performed through a local Hypervisor, on Local Machine VM's and Webhosting was done through IIS	1.0
Haroon Allahdad	26 th , Dec 24	Performed through Microsoft Azure, through Online Virtualization services, and same task as the version 1.0 was done, additionally My hosted website was also available for online view all over the world wide web.	2.0

Major task 1: Host a Website on a Local VM and access it through your own host OS and a local Client VM through it's name. Perform the step by step tasks.

Task:

Install an environment like Virtual Box which may help in creation of VM's for the virtualization task. Default VM's like Hyper-V Manager are appreciated. Next create at least 2 VM's with one acting as a server VM and the other acting as a host VM. After that show that both the VM's are working and functional. After that enable the IIS feature on the Server VM and host a website on it. Next create a connection between both the VM's and access the website from the Client OS to the hosting Server VM.

Desktop Specifications:

The screenshot displays a dark-themed interface for managing a virtual system. At the top center is a blue Zorin OS logo. Below it is a header bar with the text "Device Name" and "Haroon-Lenovo-V14-G3-82TS" followed by a right-pointing arrow. The main content area is divided into two sections: "Hardware Model" and "OS Name".

Hardware Model	Lenovo Lenovo V14 G3 IAP
Memory	8.0 GiB
Processor	12th Gen Intel® Core™ i5-1235U × 12
Graphics	Mesa Intel® Graphics (ADL GT2)
Disk Capacity	256.1 GB

OS Name	Zorin OS 17.2 Education
OS Type	64-bit
Windowing System	X11
Software Updates	>
Upgrade Zorin OS	>

Steps performed to clear the task:

- 1) As a Zorin 17 (Linux Debian Based Distribution), I have a default hypervisor known as Virtual Machine Manager (<https://ubuntu.com/server/docs/virtual-machine-manager>). I used it as a substitute for the Hyper-V Manager of Windows.
- 2) I installed two ISO files, from the internet one for Windows 10 (<https://www.microsoft.com/en-in/software-download/windows10ISO?msocid=0e6ee6c59f376fb159ef3d99e656e04>) and one for Ubuntu 24.04 (<https://ubuntu.com/download/desktop>) and I created a connection on my VMM and added three VM's on it through the connection established on QEMU/KVM Hypervisor connection. I had to take YouTube's assistance for this as it was a new interface for me being a Linux user.
- 3) I opened the VM's separately and performed the installation. I used one Windows 10 VM as a Server VM and another Windows 10 as a Client. I have also used the Ubuntu one as a Client, but here I will simply show the Windows Client and Server functionalilties.
- 4) I logged into my Server Windows and went to **Control Panel > Programs and Features > Turn Windows Feature On or Off > Click on Internet Information Services** and enable it. To check it further I had opened IIS and seen the interface and further went to a browser (Microsoft Edge) and typed localhost in the search bar.



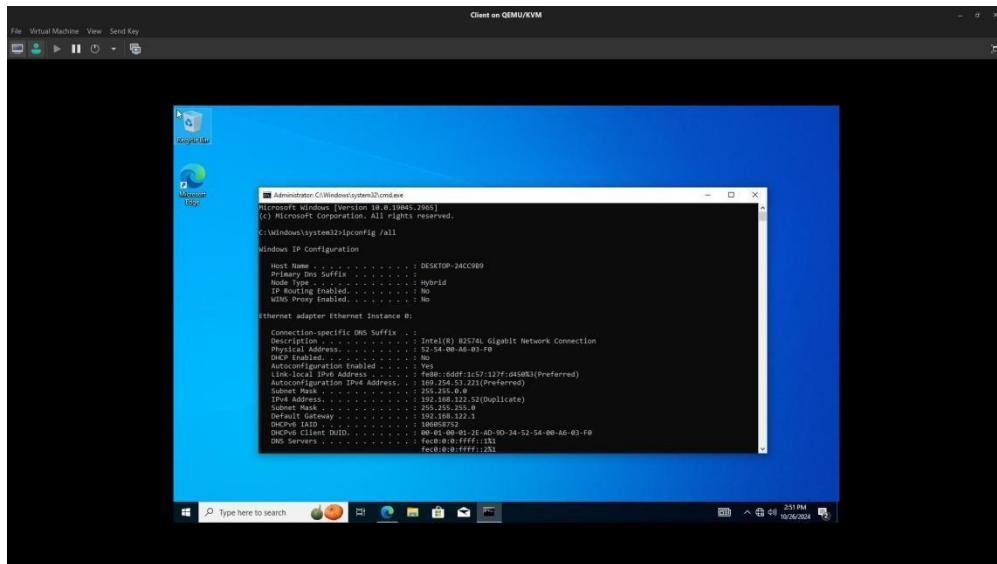
5) Initially I easily found the IP addresses of the devices through ipconfig and performed the ping command, but I noticed that after I turn off my devices (VM's), and reboot or start them again, the connection was no longer maintained, so by the help of copilot, and online searching, I found the solution which was fairly easy and suitable. It was to change the IP addresses from automatic to manual and hard-code the IP addresses to maintain a permanent connection. So I performed it by following these steps.

First go to the administrator command prompt and turn off the firewall from both the Server and Client Devices. Use this code: netsh advfirewall set allprofiles state off to verify that the changes you made have been done, type netsh advfirewall show allprofiles and confirm.

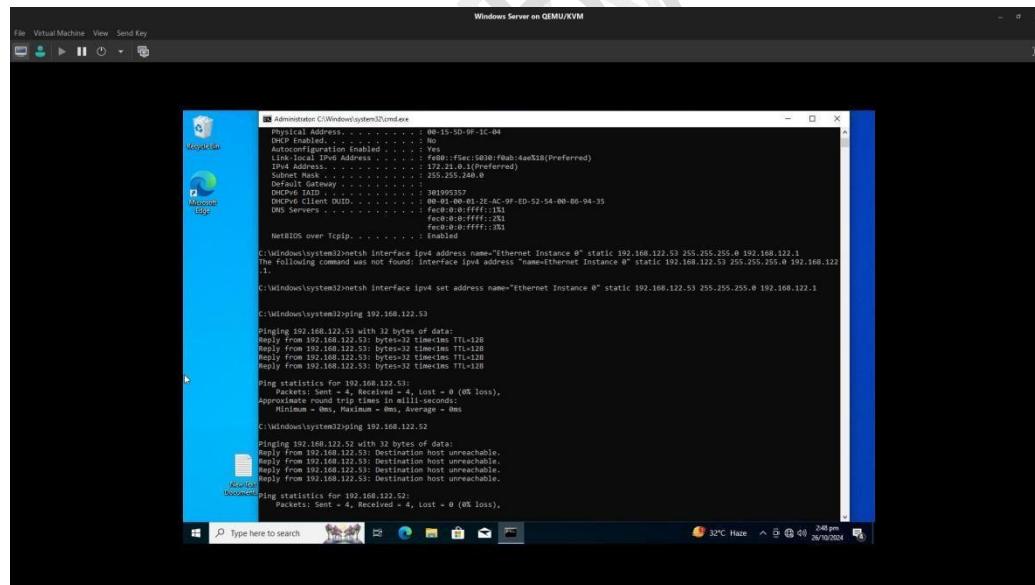
Now I typed ipconfig /all in the server VM and noted the interface_name, the actual IP address, the subnet_mask and the gateway. And then I typed this command I got from a website:

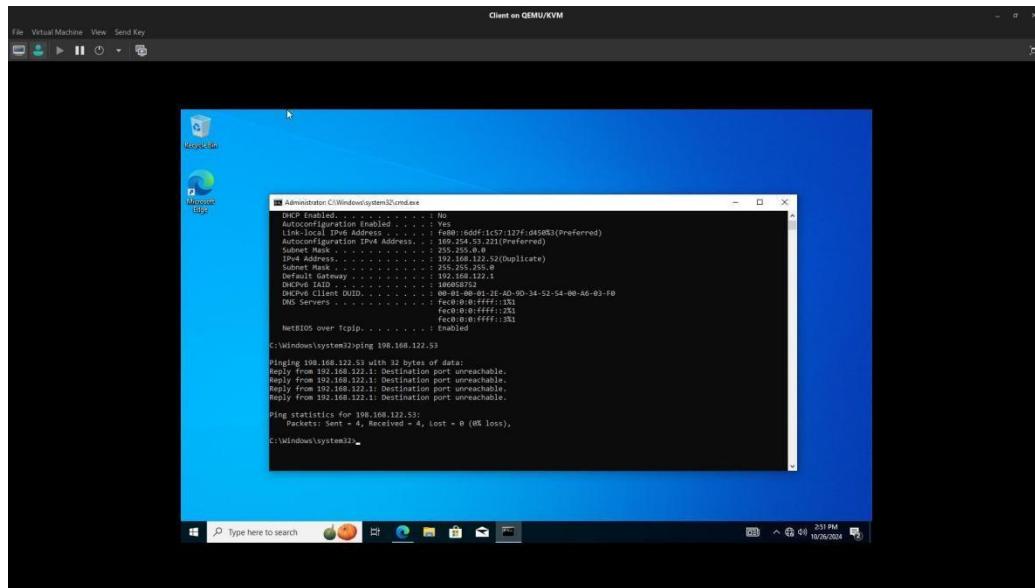
```
netsh interface ipv4 set address name="" static  
<new_ip_address> <subnet_mask> <gateway> while replacing the <info> with my  
actual values, which was netsh interface ipv4 set address name="Ethernet  
Instance 0" static 192.168.122.53 255.255.255.0 192.168.122.1
```

Then I performed the same steps in my client VM, inputting this command: netsh interface ipv4 set address name="Ethernet Instance 0" static 192.168.122.52 255.255.255.0 192.168.122.1 and hence I got the Server IP as a static 192.168.122.53 and the Client VM's IP as a static 192.168.122.52

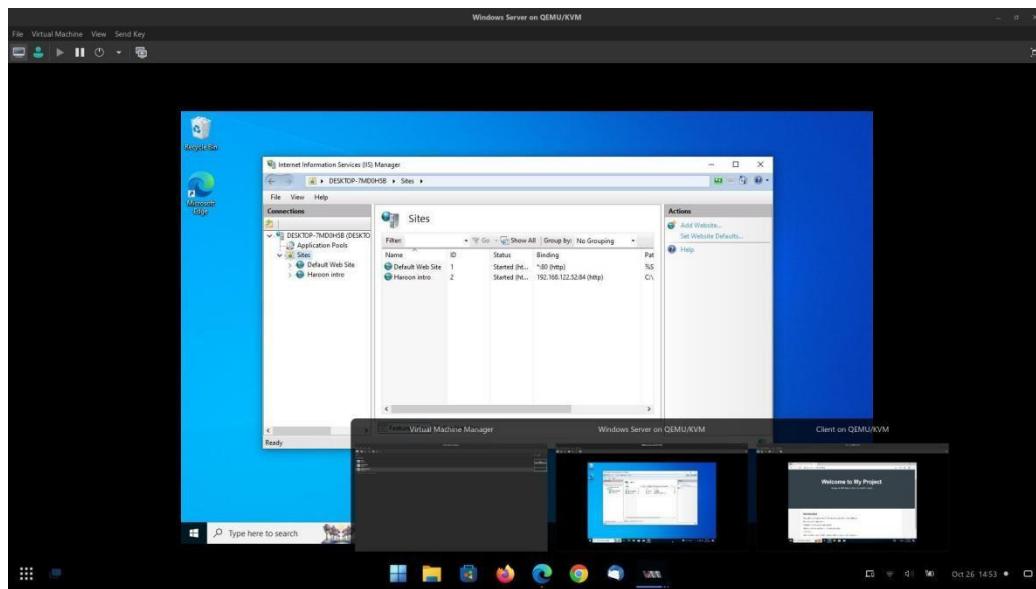


Next I had to ping them together for that I went to my Server Command Prompt and typed `ping 192.168.122.52` and similarly in my Client VM's Command Prompt typed `ping 192.168.122.53`. This was how I permanently connected my VM's together to **two-way Ping connection** for hosting of websites. The commands are also same for ping in Ubuntu.

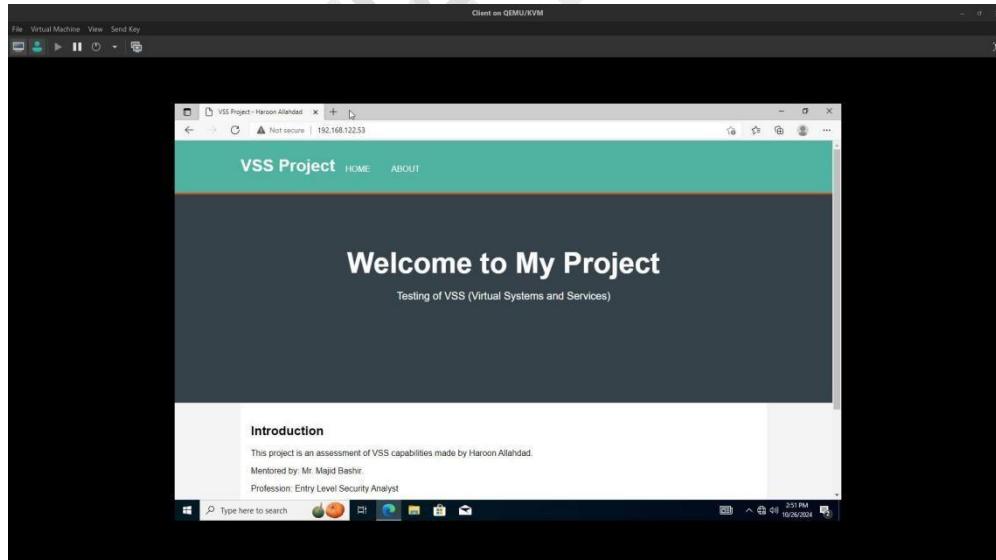


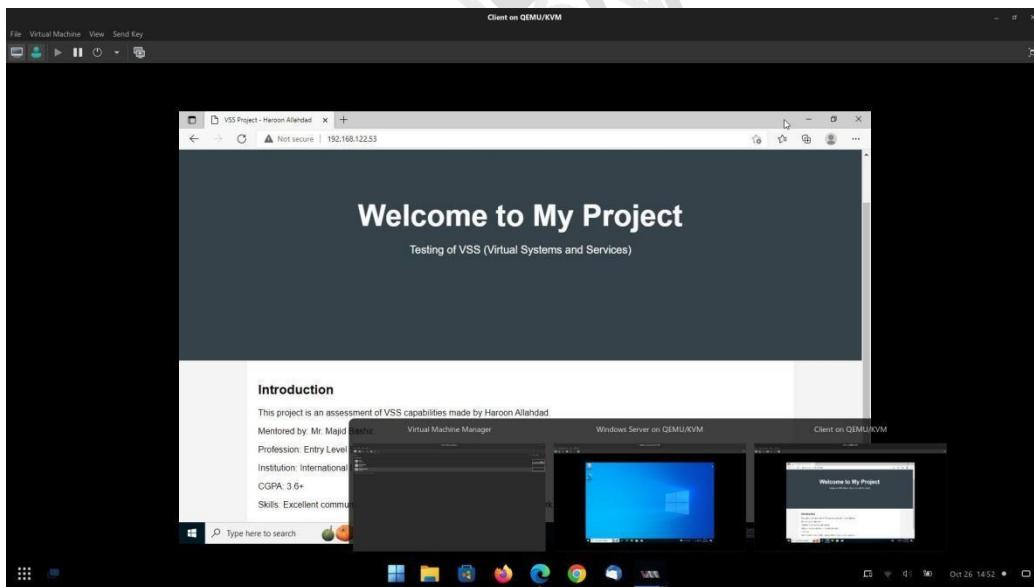
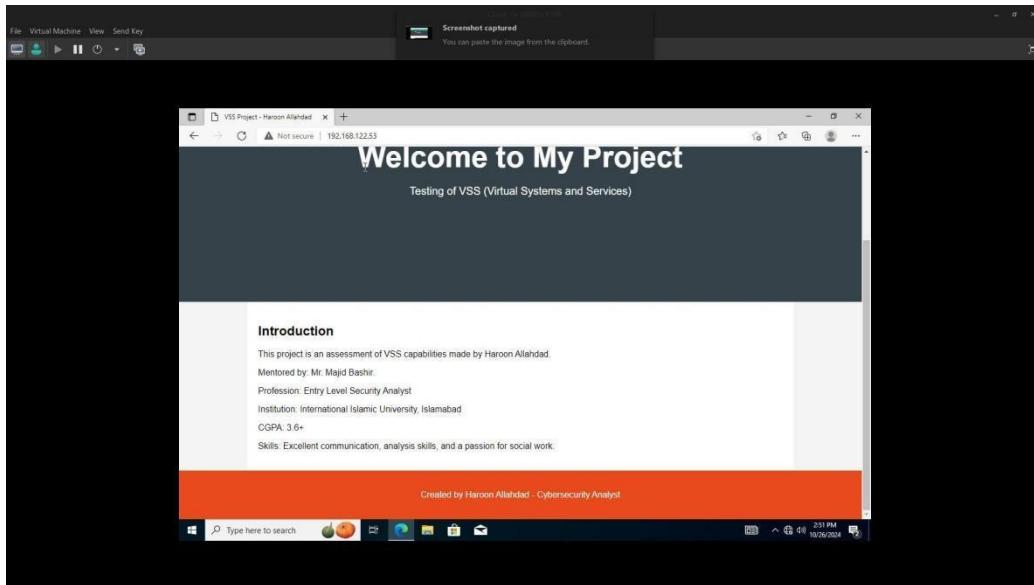


6) I have created a file on the Server VM in the following path: C:\inetpub\wwwroot and named it index and changed its file type to .html from .txt and then copied my sample website's code to it. Next I went to the IIS and clicked on Add new Website in the Sites option on the left menu panel of the IIS of Server VM and named it Haroon intro and assigned it port 84. It was showing some, error's so I did a bit of settings in the Directory Browsing and Error Pages. Also I set the Default Document for easy access.

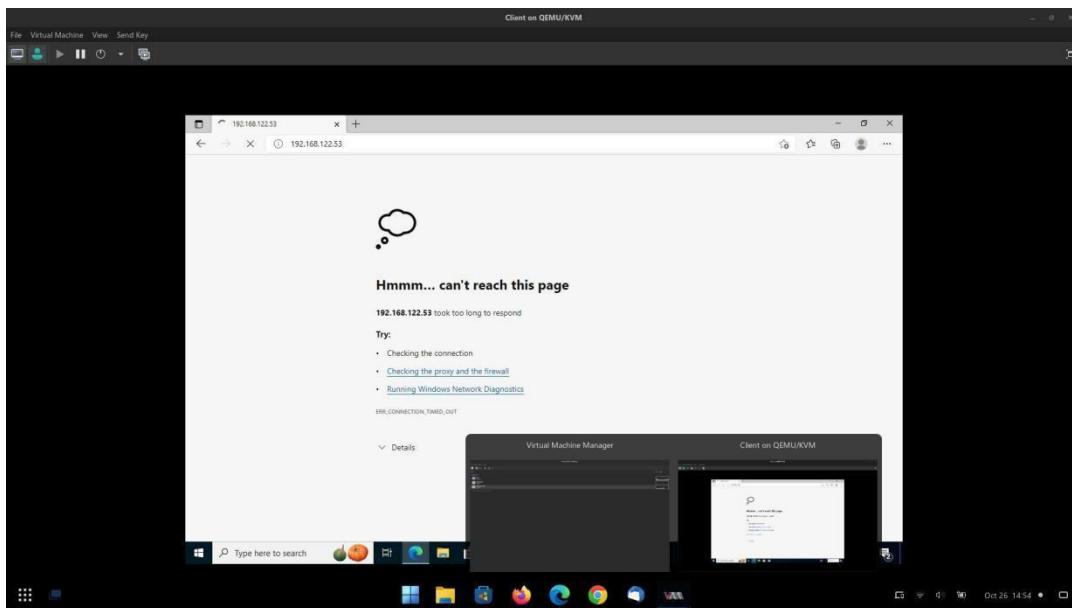


7) After that I confirmed the website by accessing it through my client VM, and it was showing it against the Server VM's IP address (192.168.130.53). Here are the pictures as proof.





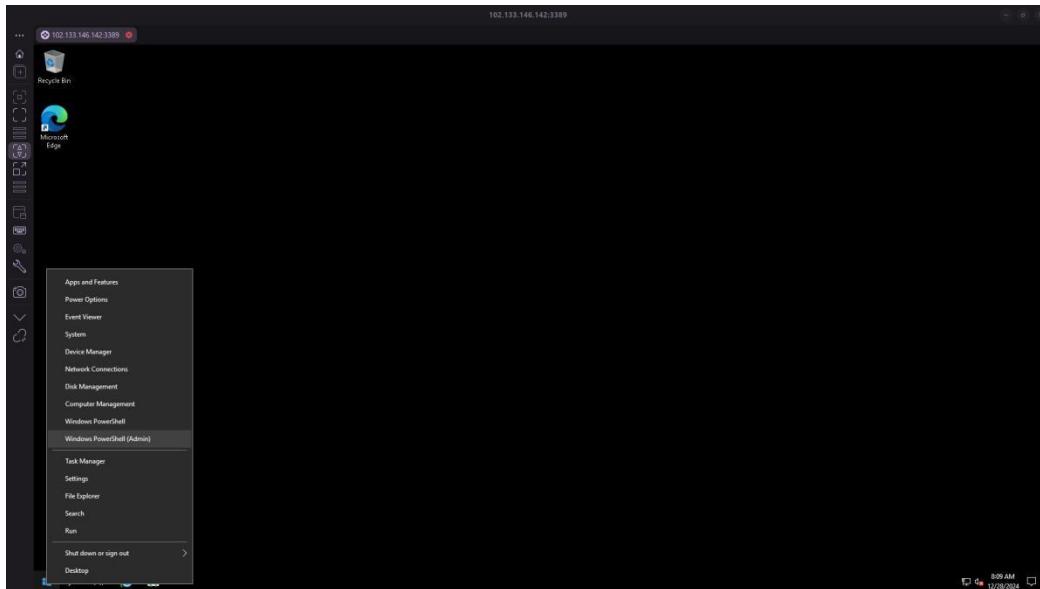
8) To further solidify my claim, I closed my Server VM, and then again opened the same link (192.168.122.53), but it returned the can't reach the page error, which showed that the Server VM



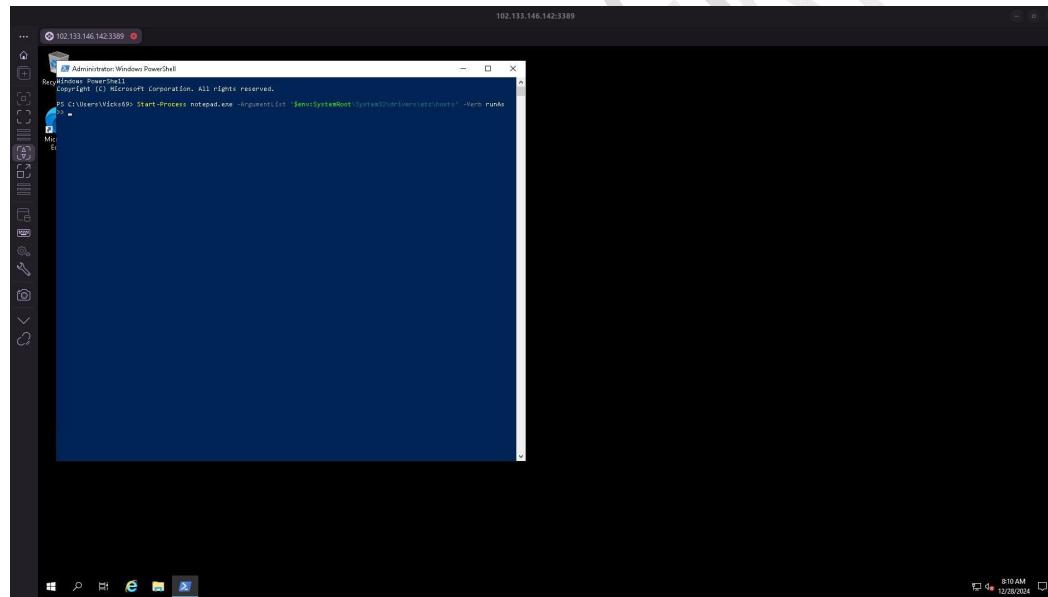
was hosting my website.

9) If we want to view our website through our host OS the same is the process we just have to use this command: `ifconfig` (in my case of Ubuntu/ Zorin based OS). Then again use same ping command with ip address of the server device.

10) Now lastly if we want to access our websites through a website name instead of ip then we can simply do this in the windows server:



Then type this command in the powershell (admin)



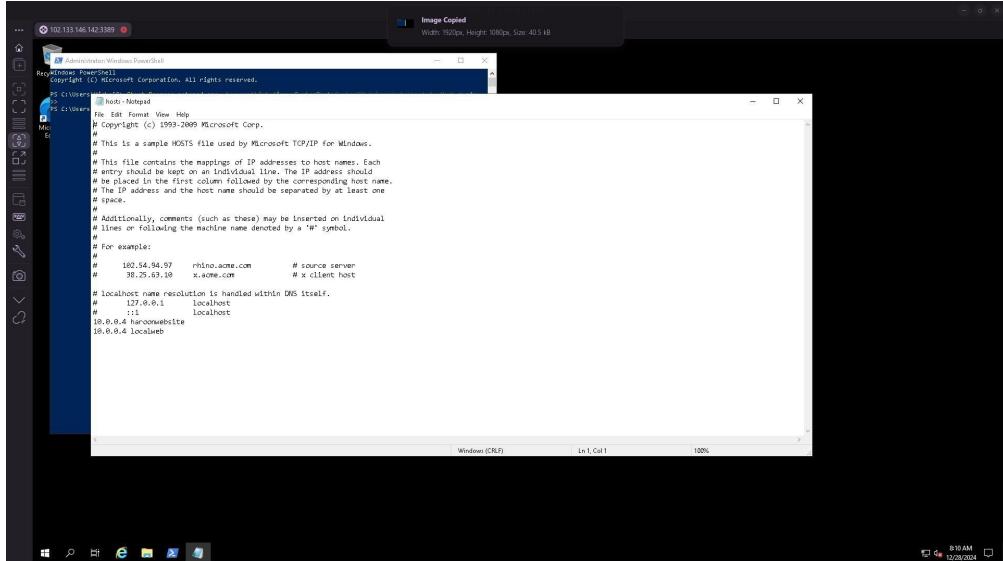
Command: Start-Process notepad.exe -ArgumentList
"\$env:SystemRoot\\System32\\drivers\\etc\\hosts" -Verb runAs

Subject: Virtual Systems & Services

Supervisor: Mr. Majid Bashir

Then hosts file would open up, here you would have to add your server's ip address through which you are able to view your website with a **space** and the website's name after it.

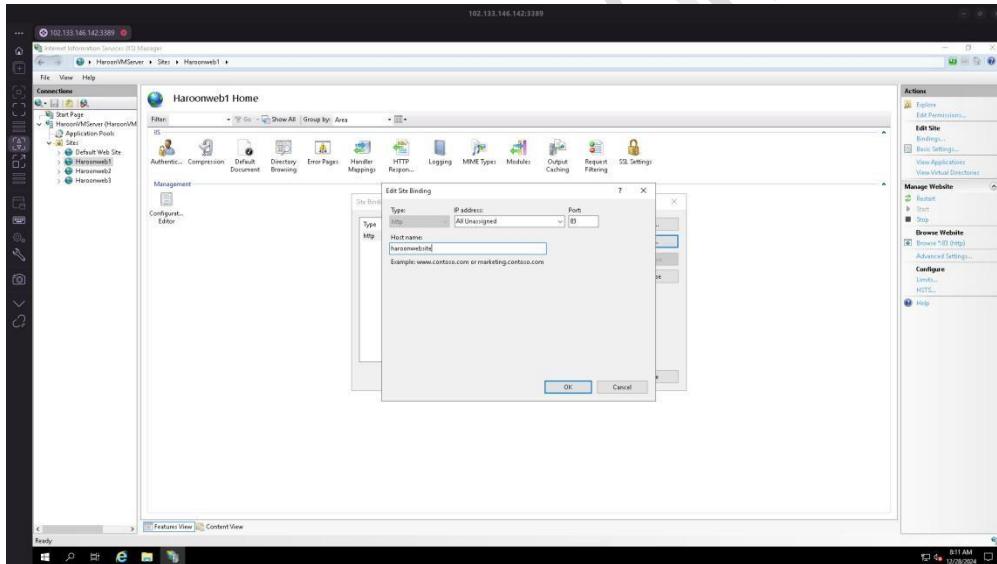
Made By HAROON



Like 10.0.0.4 haroonwebsite

Then go to the server VM's IIS and then click on the Site which you want to access through it's name, then you would see a button at the right pane named Binding, click on it and edit the bindings.

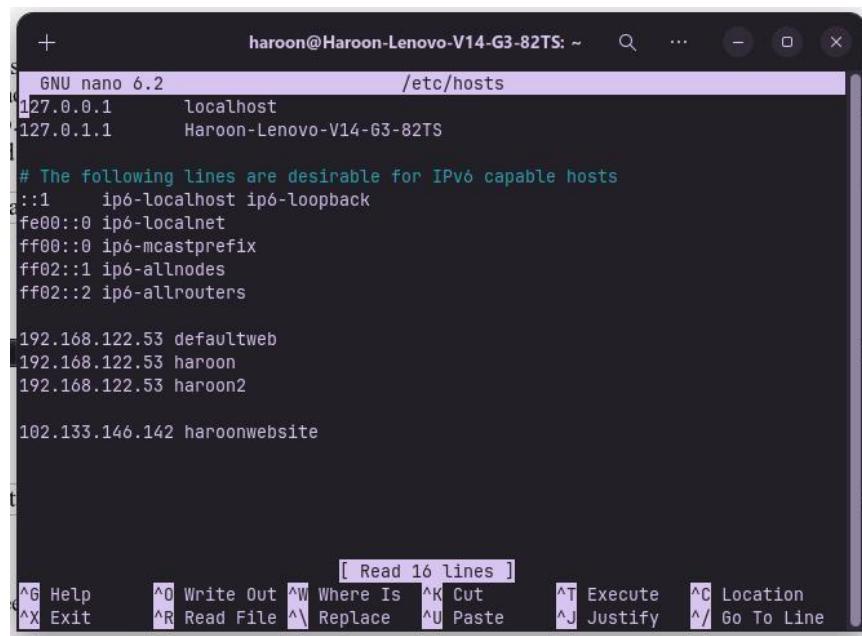
Then in the host name enter the website name you entered same as in the hosts file.



11) If the step 10 was too hard for you then you can instead perform only this step, as a shortcut, but even if you followed step 10 then too you must follow this step and go to your client VM or Host Machine or whichever machine you want to access this website from, remember that the device must be pinged two-way before this step. Then for windows go to the powershell (admin) and follow the same instructions and enter the ip address and website name as in step 10. In case of Ubuntu/ Zorin I typed this command:

```
sudo nano /etc/hosts
```

Then this screen opened:



The screenshot shows a terminal window titled "haroon@Haroon-Lenovo-V14-G3-82TS: ~". The command "sudo nano /etc/hosts" was run. The file contains the following content:

```
GNU nano 6.2          /etc/hosts
127.0.0.1      localhost
127.0.1.1      Haroon-Lenovo-V14-G3-82TS

# The following lines are desirable for IPv6 capable hosts
::1      ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters

192.168.122.53 defaultweb
192.168.122.53 haroon
192.168.122.53 haroon2

102.133.146.142 haroonwebsite

[ Read 16 lines ]
```

The bottom of the terminal shows the nano editor's command-line interface with various keyboard shortcuts.

Here I have entered some of my ip addresses which can be accessed through names. This same concept is used in DNS now-a-days in Internet terminology.

Here our Major Task 1 comes to a final ending.

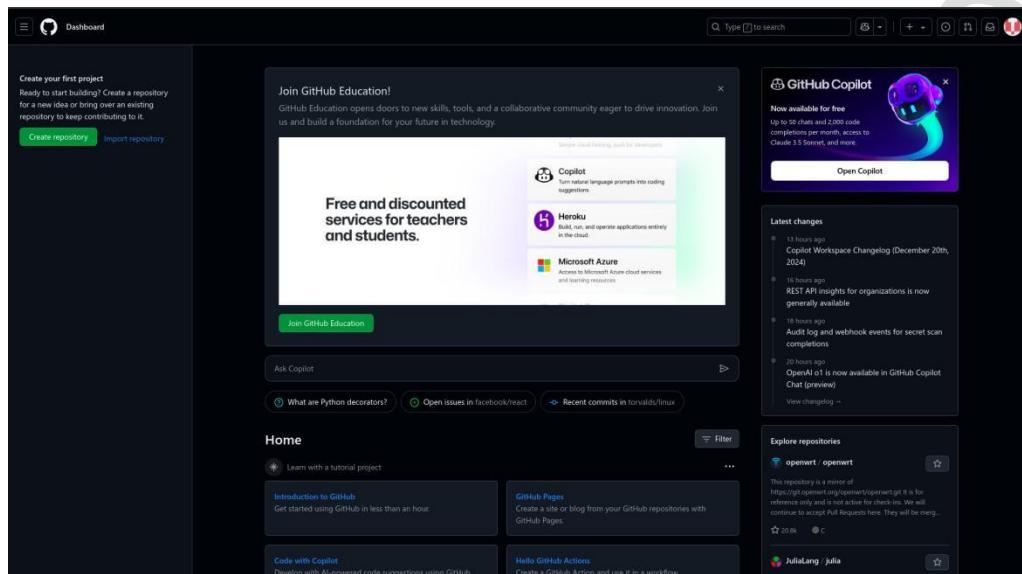
Acronyms and Abbreviations:

- VM: Virtual Machine
- VMM: Virtual Machine Manager
- OS: Operating System
- IP: Internet Protocol
- IIS: Internet Information Services
- VSS: Virtual Systems & Services

Major Task 2: Create an Azure Account and perform the same tasks as step 1 and make website available for viewers online.

Note: To start with I must tell you that I don't have a bank account, otherwise you can simply go to Microsoft Azure and signup with your credit card details and get a free 200\$ trial version credit for this task. So I used the second approach which I would advise you to follow through too.

- 1) Create a GitHub Account with your university mail.
- 2) Then I clicked on this link to get GitHub student pack.



- 3) Then you will get a form where you must enter the location of your university, select your university, add your card picture and add your transcript (permission form) image. You can change size/ quality of image with online size/ pixel converters online.
- 4) Once you submit this form correctly, you will get its confirmation email from 1 to 4 days later.



Here instead of the black line you will get a link, click on that link. And it will take you to the github student pack then you shall scroll down and get this screen:

A screenshot of the GitHub Student Developer Pack offers page. It shows a section titled "Say 'Hello world' with a profile README" with a "Go to Profile README" button. Below that is a search bar with the placeholder "Not what you were looking for? Check out our [other learning paths](#)". There's a "Student Developer Pack offers" section with a "Explore More Offers" button. Underneath, there's a "Popular offers you have not explored:" section showing various offer icons and a "+76" link. A "Curated Experiences with popular offers:" section is also visible.

Click on Explore More Offers.

4) Then you will further scroll down and in the all offers section you will find this Microsoft Azure Offer for GitHub Student Pack:

The image shows two side-by-side promotional offers. On the left is the JetBrains offer, which includes a free subscription for students, connecting GitHub account, and help at JetBrains support. On the right is the Microsoft Azure offer, which includes free access to 25+ services, \$100 in credit, connecting GitHub account, and help at Microsoft Azure support. The Microsoft Azure section is circled in red.

JETBRAINS

About JetBrains
Professional desktop IDEs: IntelliJ IDEA, PyCharm, and more.

Offer
A free subscription for students, to be renewed annually.

[Get access by connecting your GitHub account on JetBrains >](#)

[Get help at JetBrains support](#)

Microsoft Azure

About Microsoft Azure
Access to Microsoft Azure cloud services and learning resources – no credit card required

Offer
Free access to 25+ Microsoft Azure cloud services plus \$100 in Azure credit. For students aged 18+.

[Get access by connecting your GitHub account on Microsoft Azure >](#)

[Get help at Microsoft Azure support](#)

The screenshot shows the Microsoft Azure for Students landing page. It features a dark header with the Microsoft logo and navigation links like Azure, Explore, Products, Solutions, Pricing, Partners, Resources, Search, Learn, Contact Sales, Support, and Sign in. The main section has a black background with white text, advertising "Build in the cloud free with Azure for Students". It includes a "Start free" button, a "Learn about eligibility" link, and two boxes: "Start with \$100 Azure credit" and "No credit card required". Below these is a plus sign and the text "Free services" with a small note about getting popular services free while having credit.

Click on Start free.

5) Then a form would show up where you must enter your info in this form:

Academic Verification

Start by entering your name as per the school records. Select your school's country and enter your school's name. Enter your date of birth as per the school records. The email address may be used to reach you if we have trouble verifying your application, so please enter your school provided email address.

First name

Last name

Country

If your country is not listed, the offer is not available in your region. [Learn More](#)

School name

School name will help provide Microsoft with additional information for verification. If available, please enter it here.

Date of birth

School email address

Verification code (optional)

If you have received a verification code, please enter that here.

Once done with that a verification code would be sent to your university email.

Hello,

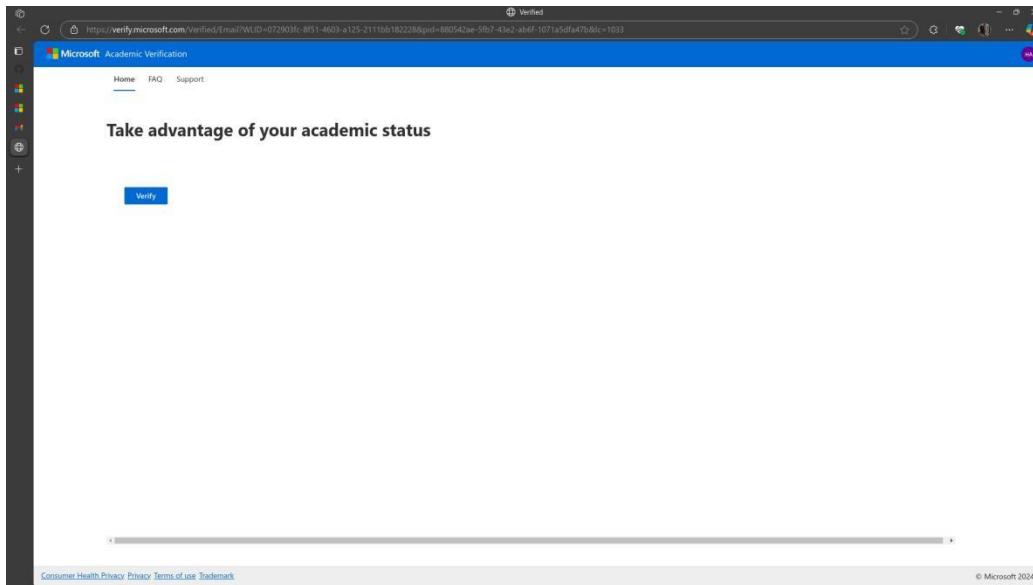
You have received this email because you recently requested verification via **Microsoft's Academic Verification** service. If you did not submit your email for this program, please disregard this email.

To complete your academic status verification, please click the link below. The link will automatically expire if not used within 5 days.

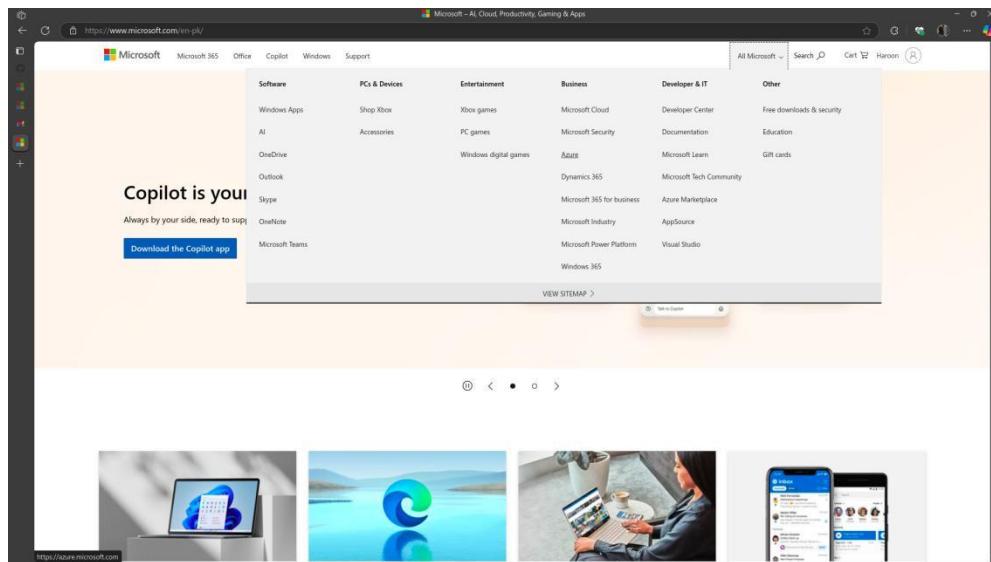
After clicking the link, your verification status will be confirmed and you will return to the site.

-Navigate to: <https://verifyemail.microsoft.com/v1.0/tokenverification/verify?signature=bDkuAwHSX42f3vYGpeuH3BoCBkE%2BqKYE6O13gXwDEXE6IXq9SGG62%2FhtxfG66n9T1yTt6en6vLBfzu7Oz2>

Click on the link at the bottom of this picture.

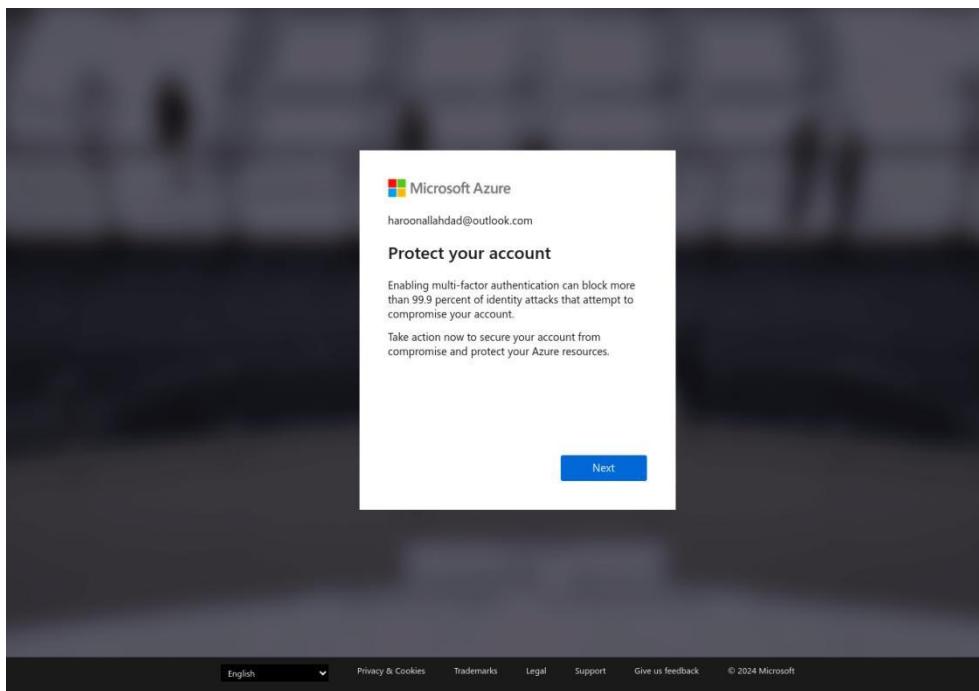


6) Then you will be lead to this screen:



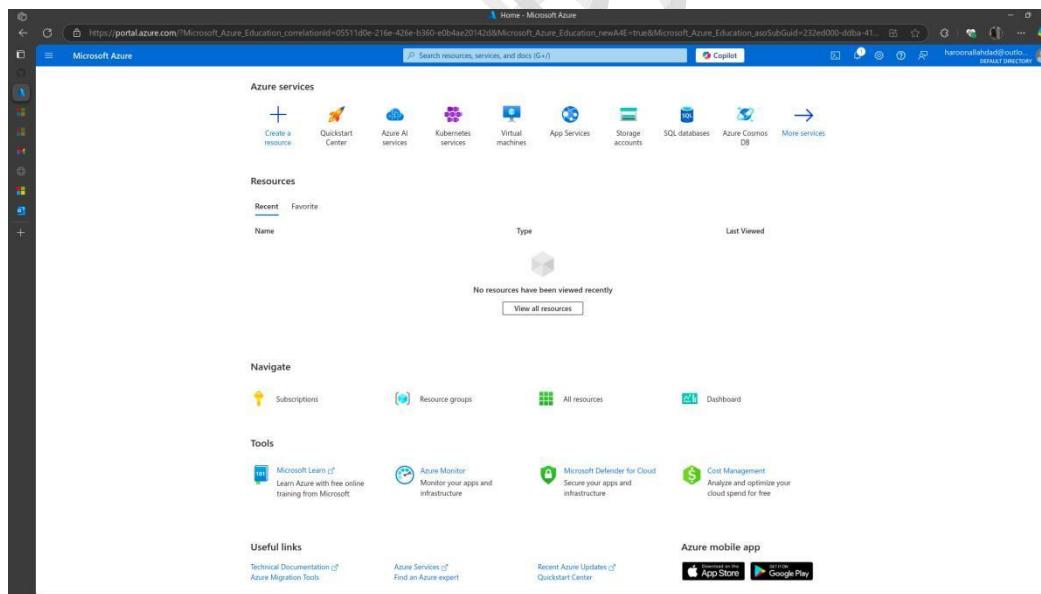
Once on this screen hover over the All Microsoft Button and a menu like this would appear and then click on Azure.

7) Now once again a form would show now look at the right side of the form if 200\$ free credit is written there then go to the first screen again which said start free and then you will directly be taken to the students form again and if not then simple add your work email (Other email then your university and your phone number in that form which doesn't have +92 in it meaning something like this: 322----). Now click on submit form, and if this form works and it goes on and shows you this screen:



Then congrats! Your Account has been created on MS Azure.

8) Now you must come across a screen like this:



9) Click on Resource Groups and then click on create and enter any name you want.

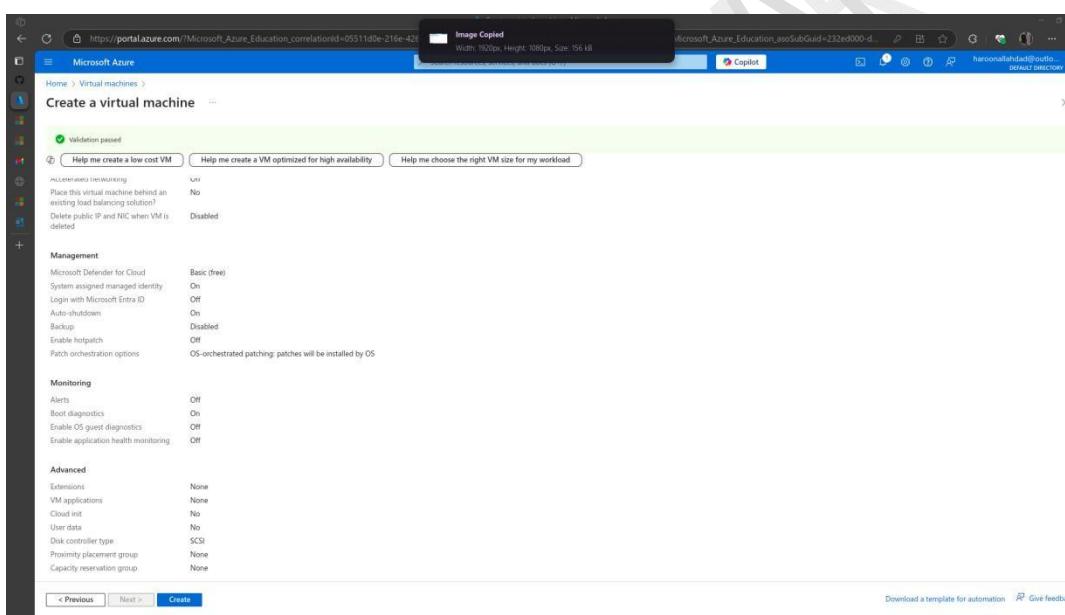
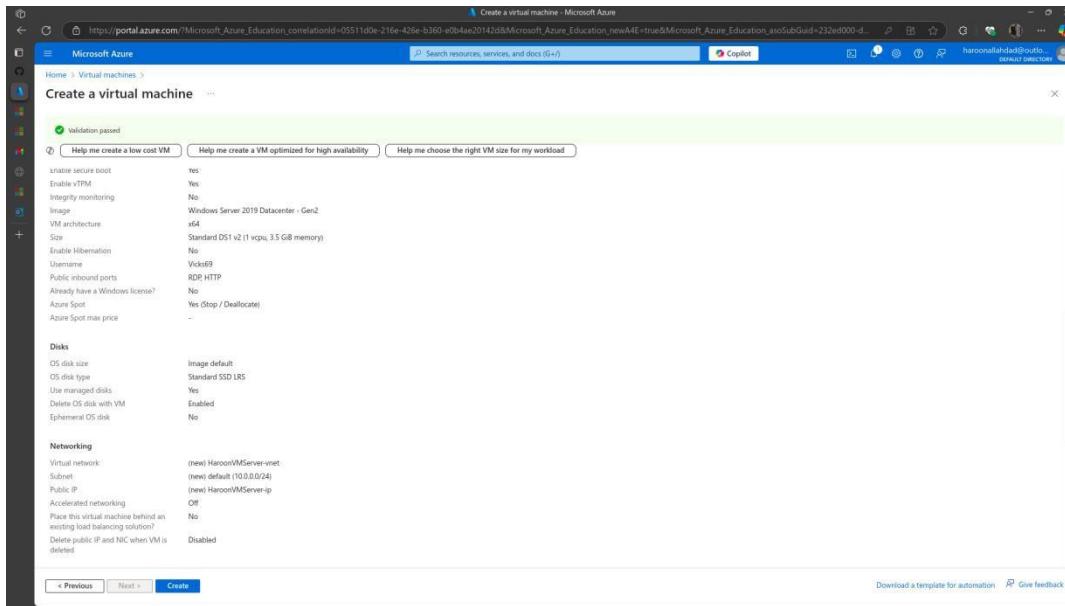
The screenshot shows the Microsoft Azure portal interface. At the top, there's a navigation bar with 'Microsoft Azure' and a search bar. Below it, a breadcrumb trail shows 'Home > Resource groups > Create a resource group'. The main area is titled 'Create a resource group' with a sub-section 'Basics'. Under 'Project details', 'Subscription' is set to 'Azure for Students' and 'Resource group' is set to 'ABC'. Under 'Resource details', 'Region' is set to '(US) East US'. A large watermark 'DRAFT' is visible across the center of the screen.

Then click on create, remember to have the Subscription at Azure for Students.

10) Again go to Microsoft Azure button at top left corner and go to the home and then click on Virtual Machines, then click on Create, Create Azure Virtual Machine.

11) Then click on the Resource group and select the one you created before, next go to size and click on more sizes and select the most basic one which suits your resources.

The screenshot shows the Microsoft Azure portal interface for creating a virtual machine. The URL is https://portal.azure.com/#Microsoft_Azure_Education_correlationId=0551160e-216e-425e-b360-e0bbae01142&Microsoft_Azure_Education_newAE=true&Microsoft_Azure_Education_aeSubGrid=332e0000-ddba-41... . The page title is 'Virtual machines > Create a virtual machine'. The 'Select a VM size' section is open, showing a list of 485 VM sizes. The 'D-Series v2' size is highlighted. The list includes various sizes like D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D45, D46, D47, D48, D49, D50, D51, D52, D53, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D64, D65, D66, D67, D68, D69, D70, D71, D72, D73, D74, D75, D76, D77, D78, D79, D80, D81, D82, D83, D84, D85, D86, D87, D88, D89, D90, D91, D92, D93, D94, D95, D96, D97, D98, D99, D100, D101, D102, D103, D104, D105, D106, D107, D108, D109, D110, D111, D112, D113, D114, D115, D116, D117, D118, D119, D120, D121, D122, D123, D124, D125, D126, D127, D128, D129, D130, D131, D132, D133, D134, D135, D136, D137, D138, D139, D140, D141, D142, D143, D144, D145, D146, D147, D148, D149, D150, D151, D152, D153, D154, D155, D156, D157, D158, D159, D160, D161, D162, D163, D164, D165, D166, D167, D168, D169, D170, D171, D172, D173, D174, D175, D176, D177, D178, 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Then click on create.

14) Similarly create a Clint VM.

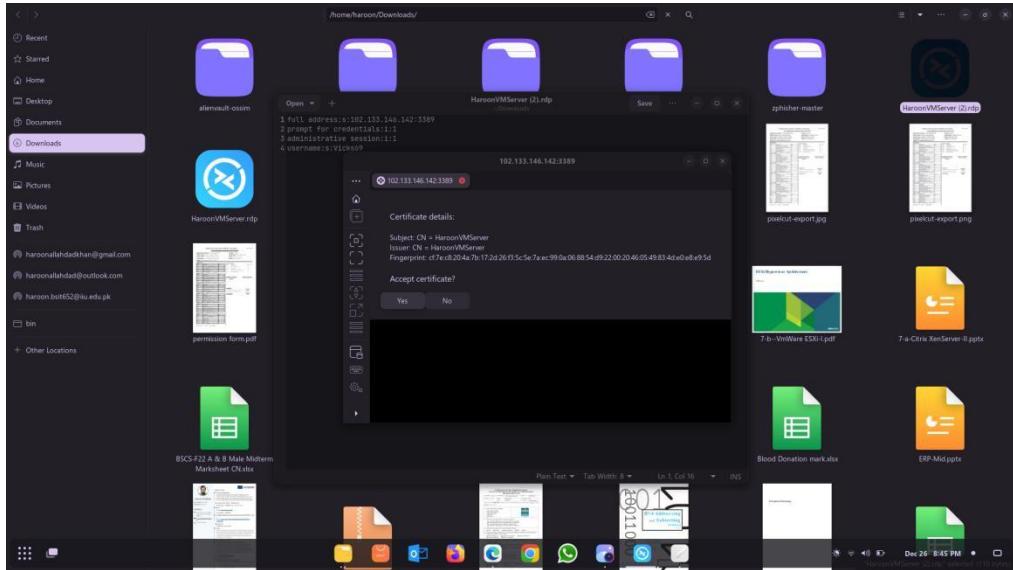
15) Now again go to Virtual Machines and select Server VM, and click on start:

The screenshot shows the Microsoft Azure portal's 'Virtual machines' section. A specific VM named 'HaroonVMServer' is selected. The 'Overview' tab is active, displaying details such as the resource group ('HAROONVMGROUP'), status ('Stopped (deallocated)'), location ('South Africa North (Zone 1)'), and subscription ('Azure for Students'). The VM is running Windows and is assigned a Standard DS1 v2 size. It has a public IP address of 102.133.146.142 and a private IP address of 10.0.0.4. The virtual network subnet is 'HaroonVMServer-vnet/default'. The DNS name is 'haroonvmsite.southafricanorth.cloudapp.azure.com'. The 'Connect' button is located at the top right of the main content area.

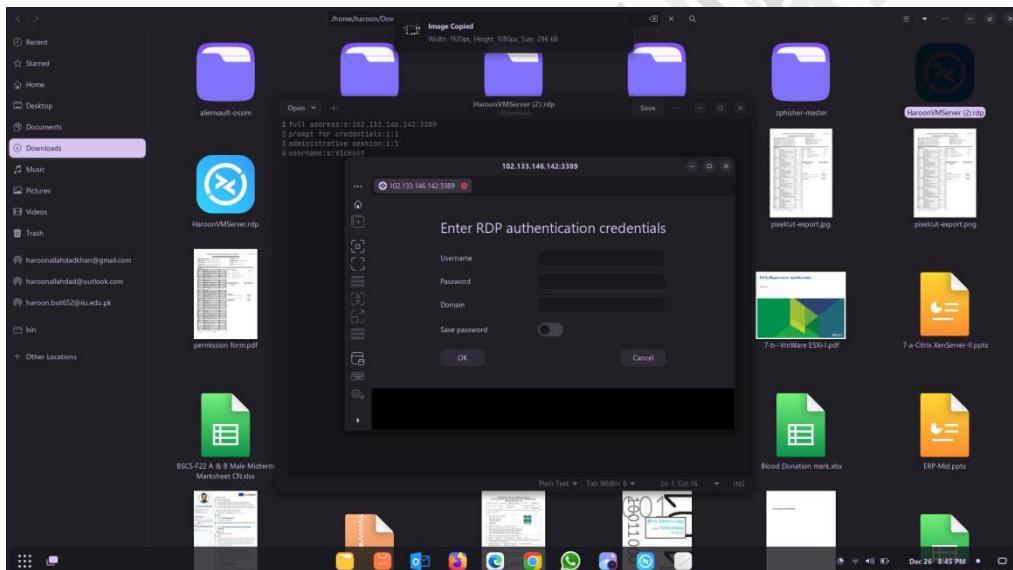
16) Then click on Connect > connect. And then you will see this page:

The screenshot shows the 'Connect' page for the 'HaroonVMServer' VM. The 'Native RDP' option is selected. The page displays the public IP address (102.133.146.142) and port (3389). There is a 'Select' button and a 'Download RDP file' link. The left sidebar shows the VM settings and connectivity options.

Download this RDP file and then click on it and it will open, but in case of Ubuntu or Zorin Open Remmina Application and open this downloaded file in text editor. Next copy the full address and paste here on Remmina App:



Next Click Yes and enter your username and password here:



Further on you can open your client VM the same way and then follow the same steps as earlier to Create and host a website through IIS on your server and then access it through your Client Machine too.

17) Now you can even access these websites through your mobile or other devices without pinging with the Azure services, you just have to turn the Server VM on.

- 18) For that you must go to the Microsoft Azure Home placed on the top left and then click on the Virtual Machines options, next turn on the Server VM and Click on the Server VM's Name to go to details. Then click on the Networking heading for details.

The screenshot shows the Microsoft Azure portal interface. On the left, there is a navigation sidebar with various options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Connect, Bastion, Windows Admin Center, Networking, Settings, Availability + scale, Security, Backup + disaster recovery, Operations, Monitoring, Automation, and Help. The main content area is titled 'HaroonVMServer - Microsoft Azure' and shows the 'Virtual machine' details for 'HaroonVMServer'. The 'Networking' section is expanded, displaying information such as Public IP address, Private IP address, Virtual network/subnet, DNS name, and Size (Standard DS1 v2). Below the networking section, there are tabs for Properties, Monitoring, Capabilities (8), Recommendations (9), and Tutorials. At the bottom, there are sections for Azure Spot and Capacity.

- 19) Then scroll down and you would see the rules panel, in it click on the add new rules option and then click on inbound rules:

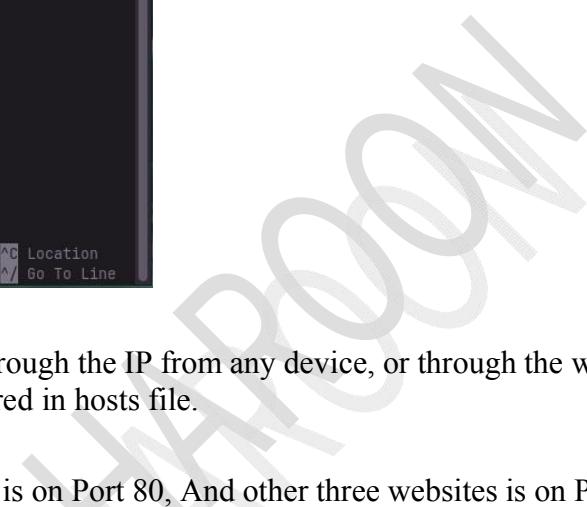
The screenshot shows the 'Network settings' page for 'HaroonVMServer'. The left sidebar includes options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Connect, Bastion, Windows Admin Center, Networking, Load balancing, Application security groups, and Network manager. Under the Networking section, the 'Rules' tab is selected. A table titled 'Inbound port rules (8)' lists rules for ports 300, 320, 330, 340, 350, 65000, 65001, and 65002. The table columns include Priority, Name, Port, Protocol, Source, Destination, and Action. The 'Action' column shows entries like 'Allow' or 'Deny' with edit icons.

- 20) Then add the following details as in the screenshot, changing the port number to the one through which you want your audience to view your server hosted website. In my case it is port 83, 84, 85 and port 80 which is default was already enabled.

The screenshot shows the Microsoft Azure portal interface. On the left, the navigation menu is open, showing options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Connect, Bastion, Windows Admin Center, Networking, Network settings, Load balancing, Application security groups, and Network manager. The 'Network settings' option under Networking is selected. The main content area displays 'HaroonVMServer | Network settings'. It shows basic network information: Network interface (haroonvmserver99_21), Virtual network/subnet (HaroonVMServer-vnet / default), Public IP address (10.2.146.142), Private IP address (10.0.0.4), and Admin security rules (0). Below this, the 'Rules' section is expanded, showing a table of inbound port rules. The table has columns for Priority, Name, Port, and Protocol. Rules listed include RDP (port 3389, TCP), HTTP (port 80, TCP), Allow-iHTTP-83 (port 83, TCP), Allow-HTTP-84 (port 84, TCP), Allow-iHTTP-85 (port 85, TCP), AllowWithInbound (port Any, Any), AllowAzureLoadBalancerInbound (port Any, Any), and DenyAllInbound (port Any, Any). The right side of the screen shows the 'Add inbound security rule' dialog. It has fields for Source (Any), Destination (Any), Protocol (TCP), Action (Allow), and a description box stating 'This is used to open port 83 for incoming traffic.' Buttons for 'Add' and 'Cancel' are at the bottom.

- 21) Then again if you want to view your website on any device through webname instead of an IP, you must again follow the steps to input your IP and webname in any host device's hosts file:

The screenshot shows a terminal window titled 'haroon@Haroon-Lenovo-V14-G3-82TS: ~'. The command 'sudo nano /etc/hosts' is run, and the password '*****' is entered. The terminal shows the contents of the /etc/hosts file, which includes the local host entry '127.0.0.1 localhost' and other entries for the server. The user is prompted to enter the sudo password.



```
GNU nano 6.2          /etc/hosts
127.0.0.1      localhost
127.0.1.1      Haroon-Lenovo-V14-G3-82TS

# The following lines are desirable for IPv6 capable hosts
::1    ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters

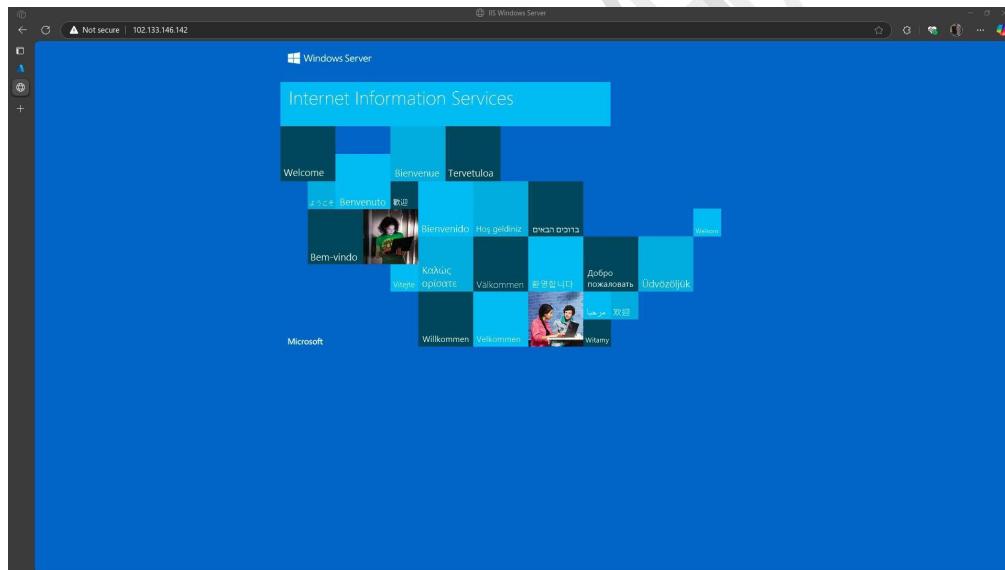
192.168.122.53 defaultweb
192.168.122.53 haroon
192.168.122.53 haroon2

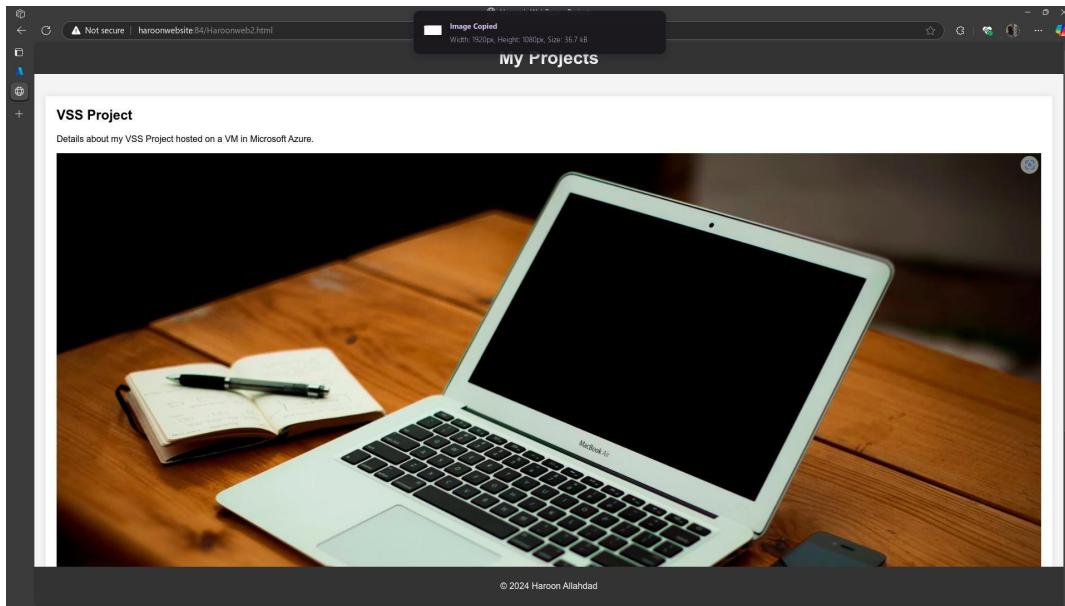
102.133.146.142 haroonwebsite

^G Help     ^O Write Out  ^W Where Is   ^K Cut        ^T Execute  ^C Location
^X Exit     ^R Read File  ^\ Replace   ^U Paste      ^J Justify  ^/ Go To Line
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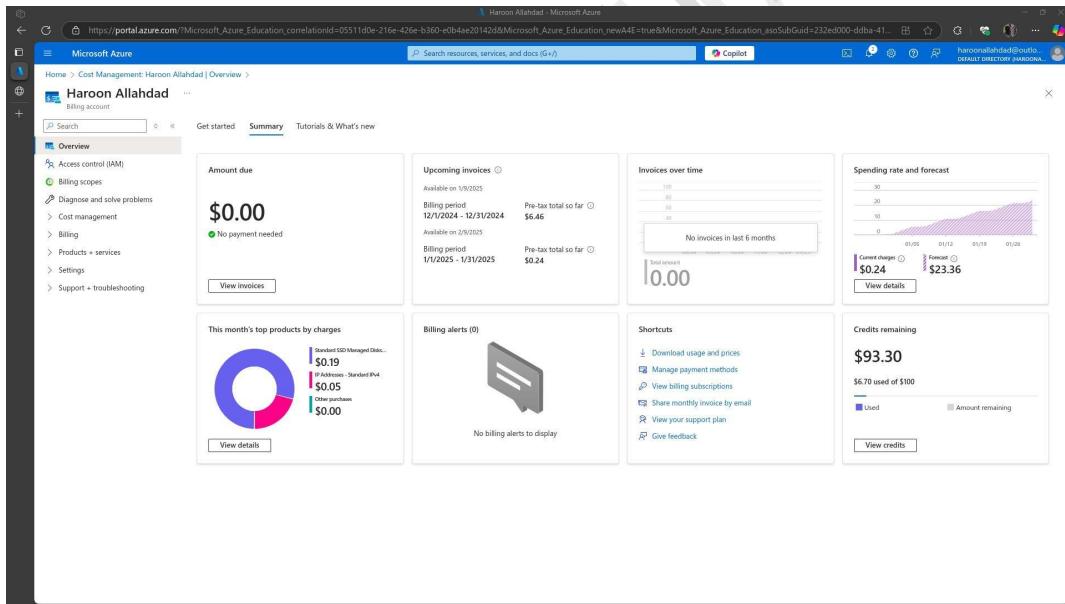
- 22) Next you can now access your website through the IP from any device, or through the webname from the devices your IP and webname is stored in hosts file.

Here are some photo's (My localhost website is on Port 80, And other three websites is on Port 83, 84 and 85 and my public IP is 102.133.146.142)





23) Now even after performing all the works I only spent roundabout 0.70\$ in credit, but after extensive testing and checking things out, I still had this much credit left:



Your Major Task 2 is also Done after this! Congrats!

For Further details on these steps if you are facing issues related to them or having troubleshooting problems, ask for assistance from Gemini or Copilot as they may assist you better than any video or web tutorials or you may also mail me directly on haroonallahdad@outlook.com.