

- 1) Install Azure CLI.
- 2) Install Open SSH Client

```
Administrator: Windows PowerShell
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\WINDOWS\system32> Get-WindowsCapability -Online | Where-Object Name -like 'OpenSSH*'

Name : OpenSSH.Client~~~~0.0.1.0
State : Installed

Name : OpenSSH.Server~~~~0.0.1.0
State : NotPresent

PS C:\WINDOWS\system32>
```

- 3) Type the command to get the SSH keys.

```
PS C:\WINDOWS\system32> ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (C:\Users\Malyka Awais/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
```

- 4) Login to azure:

```
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PS C:\WINDOWS\system32> az login
A web browser has been opened at https://login.microsoftonline.com/organizations/oauth2/v2.0/authorize.
If browser fails to open, use device code flow with `az login --use-device-code`.
[
  {
    "cloudName": "AzureCloud",
    "homeTenantId": "07ef1208-413c-4b5e-9cdd-64ef305754f0",
    "id": "67be5dce-0093-44c0-902b-503a2e84ae28",
    "isDefault": true,
    "managedByTenants": [],
    "name": "CSCT Cloud Programming",
    "state": "Enabled",
    "tenantId": "07ef1208-413c-4b5e-9cdd-64ef305754f0",
    "user": {
      "name": "Abdulla2.A1-Khayat@live.uwe.ac.uk",
      "type": "user"
    }
  }
]
PS C:\WINDOWS\system32>
```

- 5) Change Permissions:

```
OpenSSH_for_Windows_8.1p1, LibreSSL 3.0.2
Bad owner or permissions on C:\\Users\\Malyka Awais\\.ssh\\config
PS C:\\WINDOWS\\system32> icacls "C:\\Users\\malyka awais\\.ssh\\config" /inheritance:r /grant:r "malyka awais:(R)"
processed file: C:\\Users\\malyka awais\\.ssh\\config
Successfully processed 1 files; Failed processing 0 files
```

- 6) **az ssh vm --ip csctcloud.uwe.ac.uk**

```
PS C:\\WINDOWS\\system32> az ssh vm --ip csctcloud.uwe.ac.uk
OpenSSH_for_Windows_8.1p1, LibreSSL 3.0.2
The authenticity of host 'csctcloud.uwe.ac.uk (51.141.74.169)' can't be established.
ECDSA key fingerprint is SHA256:iNbchN5cwS5ZjS6rBCya9iWA80Wr9satVi0fVeaeC8M.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'csctcloud.uwe.ac.uk,51.141.74.169' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-1034-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Sat Mar 18 17:23:55 GMT 2023

System load:  0.01               Processes:            302
Usage of /home: 99.6% of 599.99GB Users logged in:      0
Memory usage:   8%               IPv4 address for eth0: 10.0.90.5
Swap usage:     0%

=> /home is using 99.6% of 599.99GB

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

 * Introducing Expanded Security Maintenance for Applications.
   Receive updates to over 25,000 software packages with your
   Ubuntu Pro subscription. Free for personal use.

   https://ubuntu.com/azure/pro

Expanded Security Maintenance for Applications is not enabled.

9 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

14 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

New release '22.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Thu Feb  2 17:04:52 2023 from 164.11.203.52
```

- 7) **abdulla2.al-khayat@live.uwe.ac.uk@csctcloud: \$**

- 8) SSH Key saved:

```
abdulla2.al-khayat@live.uwe.ac.uk@csctcloud: $ nano .ssh/authorized_keys
```

- 9) Whenever it gives bad owner or permission denied:

Run this command:

icacls "C:\\Users\\malyka awais\\.ssh\\config" /inheritance:r /grant:r "malyka awais:(R)"

```
PS C:\\WINDOWS\\system32> icacls "C:\\Users\\malyka awais\\.ssh\\config" /inheritance:r /grant:r "malyka awais:(R)"
processed file: C:\\Users\\malyka awais\\.ssh\\config
Successfully processed 1 files; Failed processing 0 files
PS C:\\WINDOWS\\system32>
```

- 10) ssh **abdulla2.al-khayat@live.uwe.ac.uk@csctcloud.uwe.ac.uk**

All TASKS Screen shots

```
✓ [32] print(encode_morse("Abdullah"))
```

• • • • •

```
[80] print(decode_morse(".... . .... --- / .... --- .- / .- .- . / -.- -.- .."))
```

HELLO HOW ARE YOU

✓ [▶] 0s !python /content/drive/MyDrive/morse_unit.py

..

Ran 2 tests in 0.000s
OK

```
✓ [20] !python /content/drive/MyDrive/morse_unit2.py
```

```
.....
-----
Ran 6 tests in 0.000s

OK
```

```
✓ [30] decode_bt(".-")  
0s  
      'W'
```

```
[57] encoded_message = encode_ham('sender', 'receiver', 'abdullahalkhayat')
      print(encoded_message)
```

[illegible]

```

✓ [58] sender, receiver, message = decode_ham(encoded_message)
0s print(sender, receiver, message)

decoded_msg: receiver de sender * abduallahalkhayat *
receiver sender abduallahalkhayat *

```

COMMAND	PID	USER	FD	TYPE	DEVICE	SIZE/OFF	NODE	NAME
node	1300943	abdulla2.al-khayat@live.uwe.ac.u	30u	IPv6	2820519	0t0	TCP	*:5162 (LISTEN)

```

• abdulla2.al-khayat@live.uwe.ac.uk@csctcloud:~/webdevelopment/iot_starter$ source /home/abdulla2.al-khayat/webdevelopment/iot_starter/iot_env/bin/activate
○ (iot_env) abdulla2.al-khayat@live.uwe.ac.uk@csctcloud:~/webdevelopment/iot_starter$ node /home/abdulla2.al-khayat/webdevelopment/iot_starter/iot_env/client.js
WebSocket connection opened
Message from server: <Buffer 48 65 6c 6c 6f 20 57 65 62 53 6f 63 6b 65 74 20 63 6c 69 65 6e 74 21>
python task1worksheet3.py
█

```

```

• (iot_env) abdulla2.al-khayat@live.uwe.ac.uk@csctcloud:~/webdevelopment/iot_starter$ python /home/abdulla2.al-khayat/webdevelopment/iot_starter/iot_env/bin/task1worksheet3.py
Base64: b'CgAqACEAyztXZlWxb21lIHRvIElvVCBVRFAgU2VydMvy'
Server Sent: b'\n\x00*\x00!\x00\xcb;Welcome to IoT UDP Server'
Decoded Packet:
Source Port: 10
Dest Port: 42
Data Length: 33
Checksum: 15307
Payload: Welcome to IoT UDP Server

```