WEB SECURITY:

SECURE DATA STORAGE

(SETTING UP KEY BASED AUTHENTICATION IN DEBIAN)

RRC Polytech

Full Stack Web Development

Winnipeg, MB Canada

RRC POLYTECH

Motivation

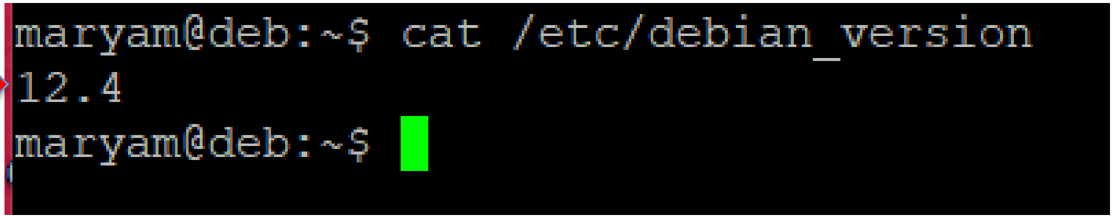
- **Hackers are (or could be) actually good, pleasant and extremely intelligent people who could keep computer criminals on the run (run away, escaping).**

Ankit Fadia

Tools Needed for This Step

Required tools

- Windows based SSH client (called PuTTY)
- Key generating tool (called puttygen)
- Connection to openssh_server running on Debian
- Debian operating system version 10 or higher

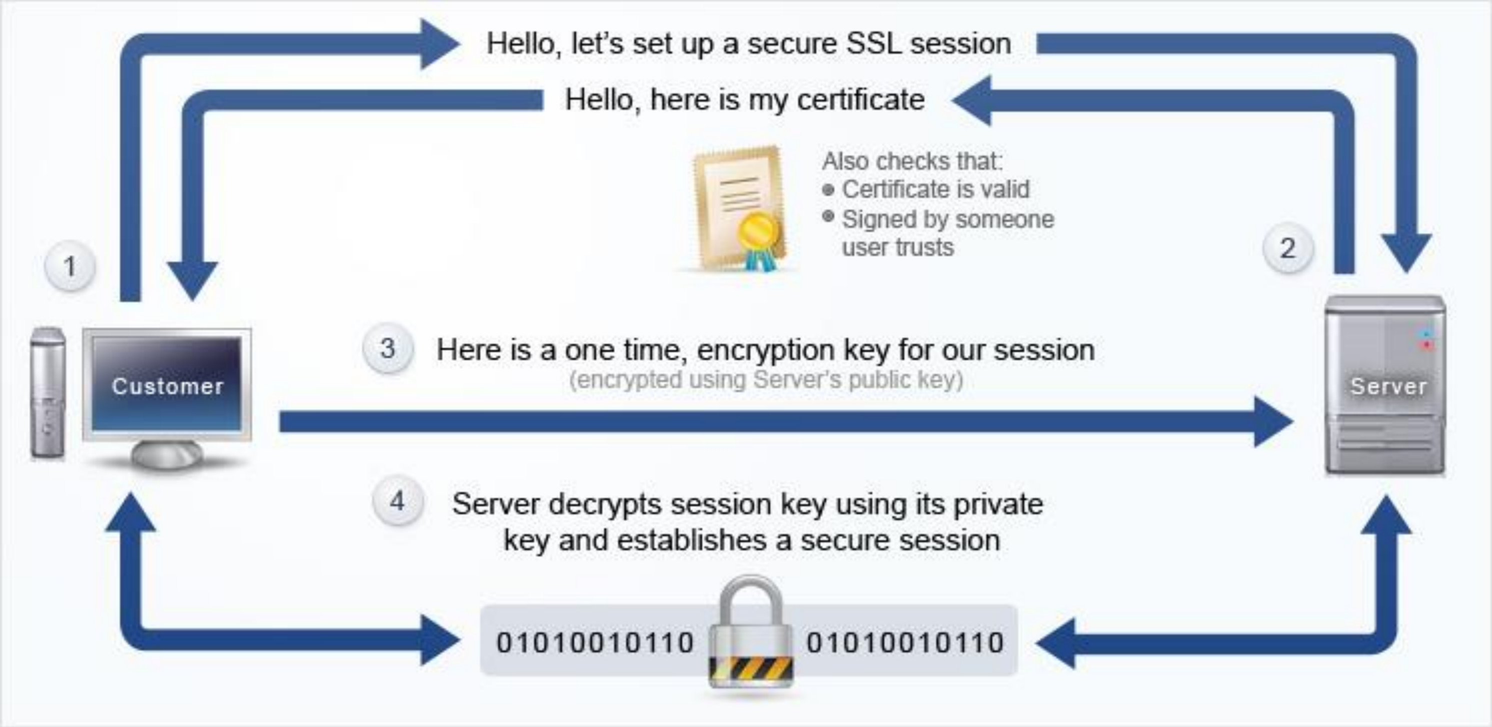


```
maryam@deb:~$ cat /etc/debian_version
12.4
maryam@deb:~$ 
```

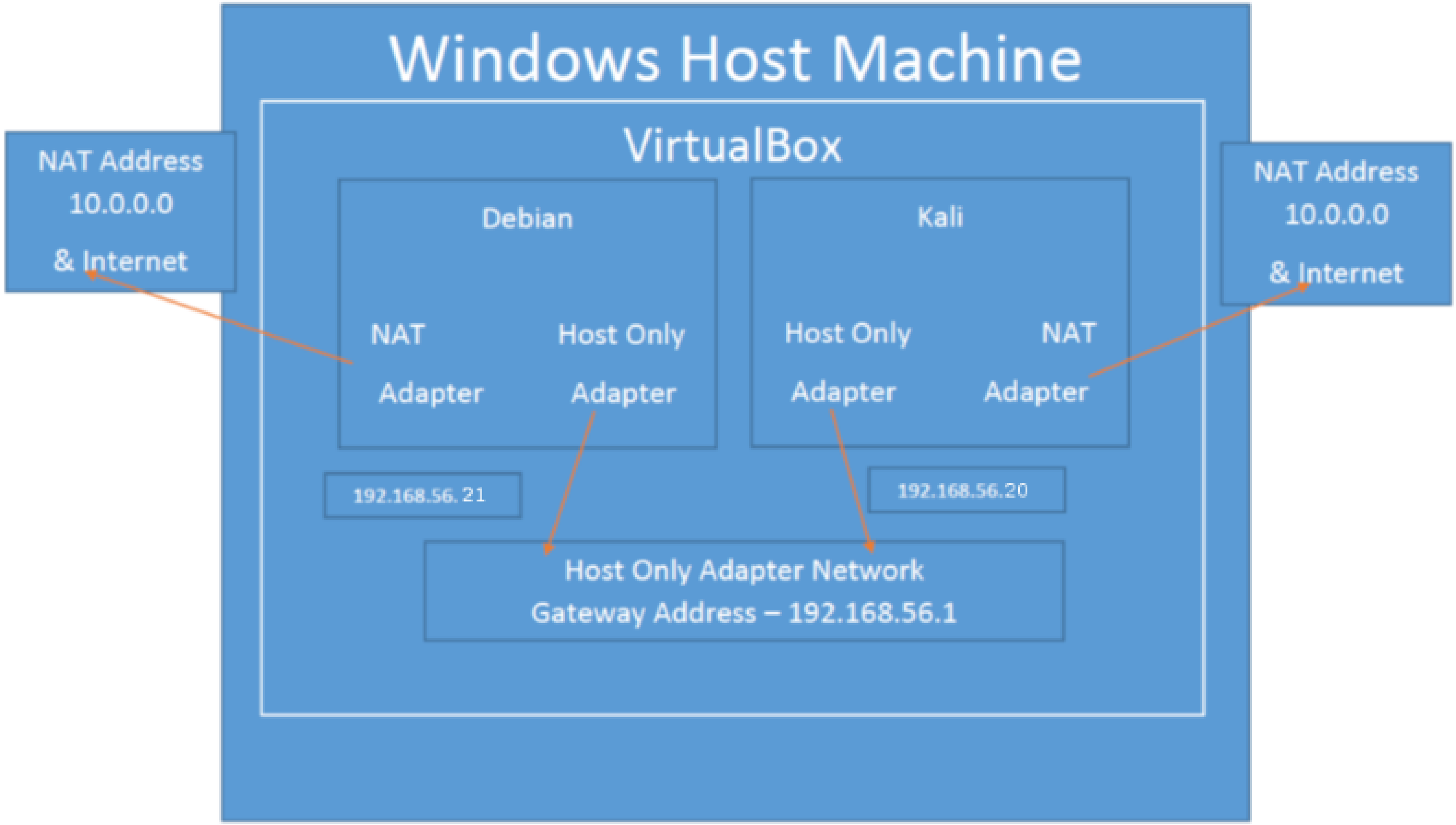
Setting Up SSH Key Based Authentication

- Encrypted communications (TLS (SSL), SSH, SFTP, SCP) are required for communications.

How TLS Works

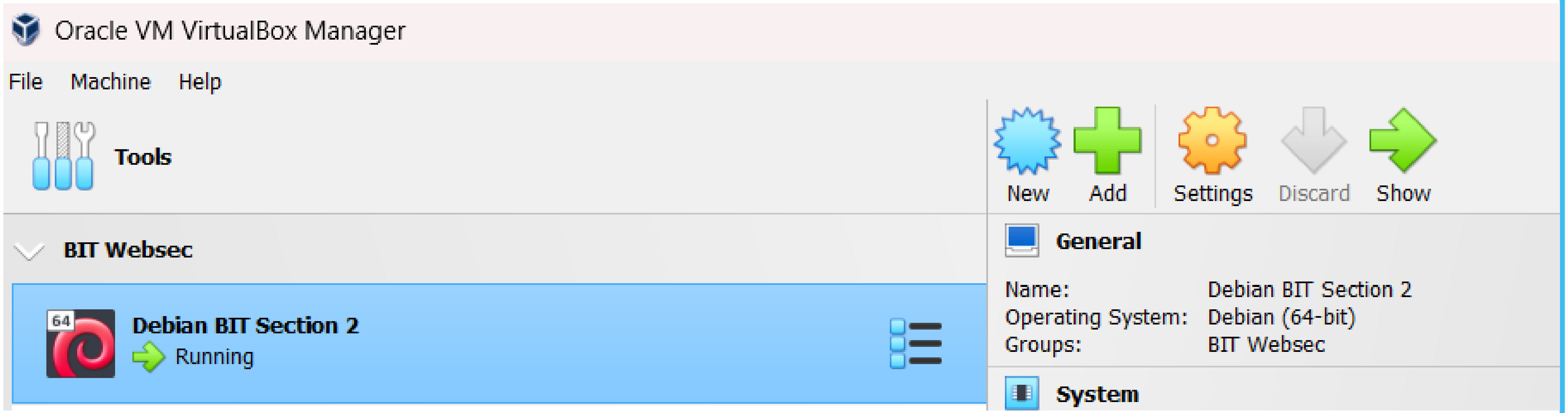


Hello, let's set up a secure SSL session
Hello, here is my certificate
Also checks that:
Certificate is valid
Signed by someone user trusts
1
2
Customer
Server
3
Here is a one time, encryption key for our session
(encrypted using Server's public key)
4
Server decrypts session key using its private key and establishes a secure session
01010010110
01010010110


Windows Host Machine
VirtualBox
NAT Address
10.0.0.0
& Internet
Debian
NAT
Adapter
Host Only
Adapter
192.168.56. 21
Kali
Host Only
Adapter
NAT
Adapter
192.168.56.20
NAT Address
10.0.0.0
& Internet
Host Only Adapter Network
Gateway Address – 192.168.56.1

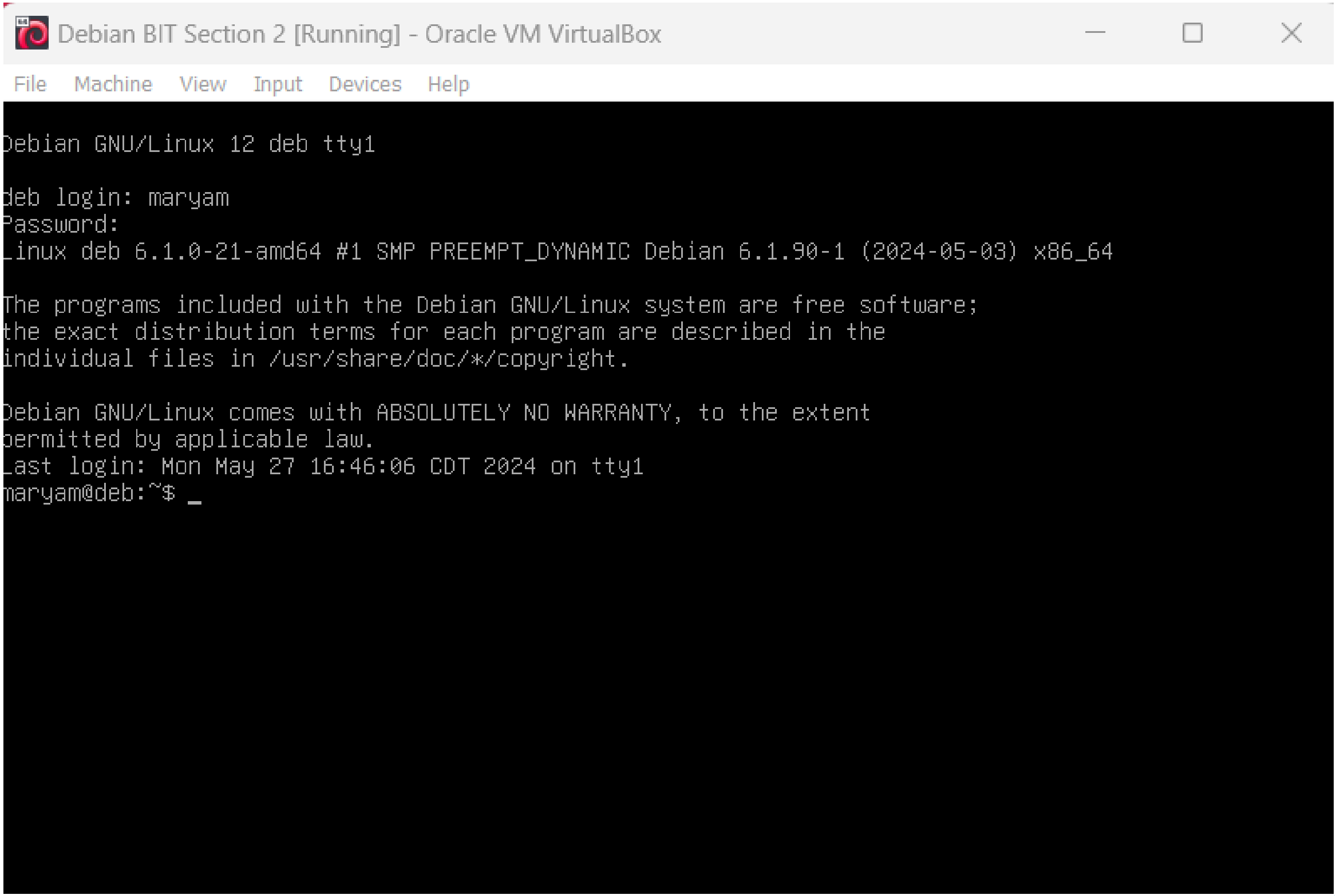
verify your network is **setup** properly

Run Debian



Name: Debian BIT Section 2
Operating System: Debian (64-bit)
Groups: BIT Websec

Login Debian as a Regular User



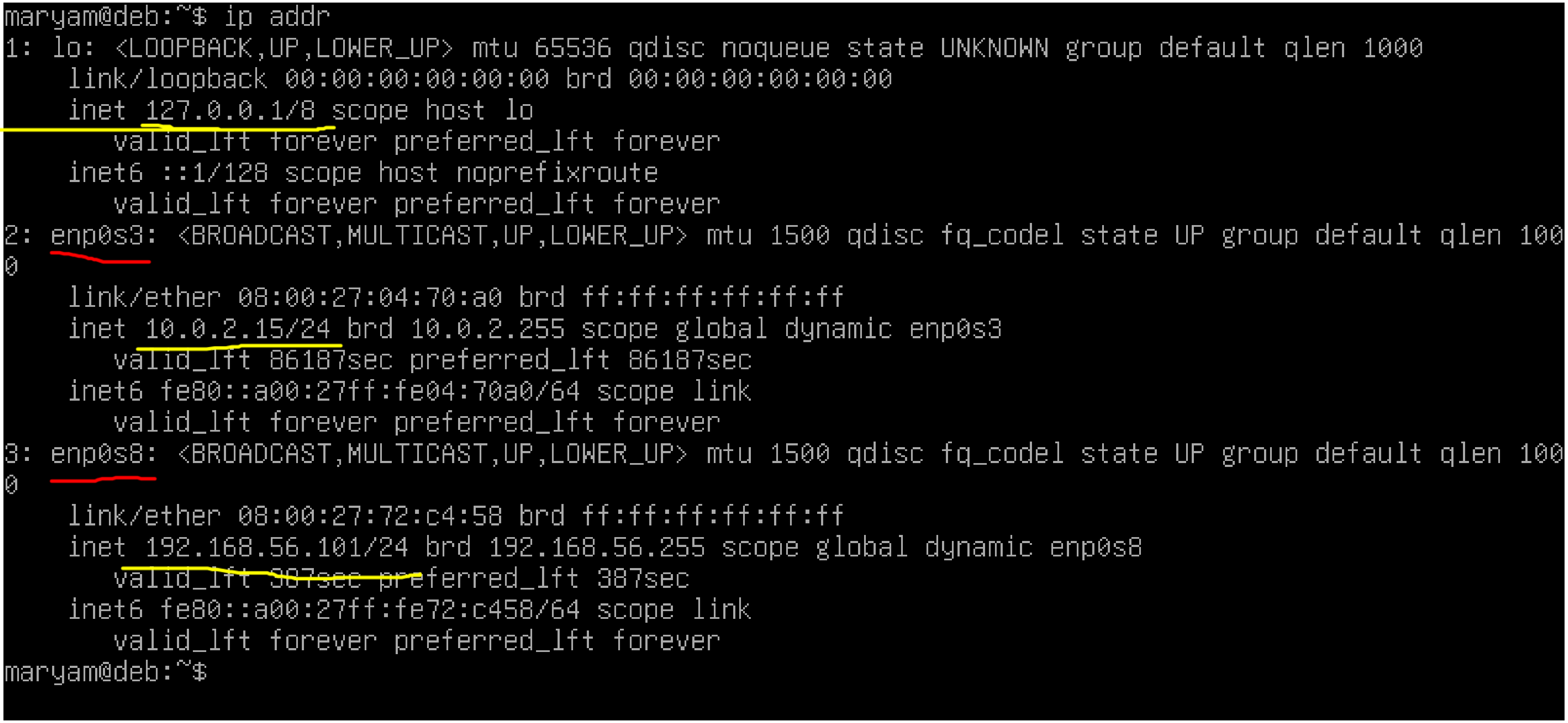
```
Debian GNU/Linux 12 deb tty1

deb login: maryam
Password:
Linux deb 6.1.0-21-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.1.90-1 (2024-05-03) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Mon May 27 16:46:06 CDT 2024 on tty1
maryam@deb:~$ _
```

Run “ip addr”



```
maryam@deb:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 100
0
    link/ether 08:00:27:04:70:a0 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic enp0s3
       valid_lft 86187sec preferred_lft 86187sec
    inet6 fe80::a00:27ff:fe04:70a0/64 scope link
       valid_lft forever preferred_lft forever
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 100
0
    link/ether 08:00:27:72:c4:58 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.101/24 brd 192.168.56.255 scope global dynamic enp0s8
       valid_lft 387sec preferred_lft 387sec
    inet6 fe80::a00:27ff:fe72:c458/64 scope link
       valid_lft forever preferred_lft forever
maryam@deb:~$
```

Creating an Asynchronous Key Connection between Windows WinSCP, PuTTY, and Debian

RRC POLYTECH

public/private key to enable ssh key authentication

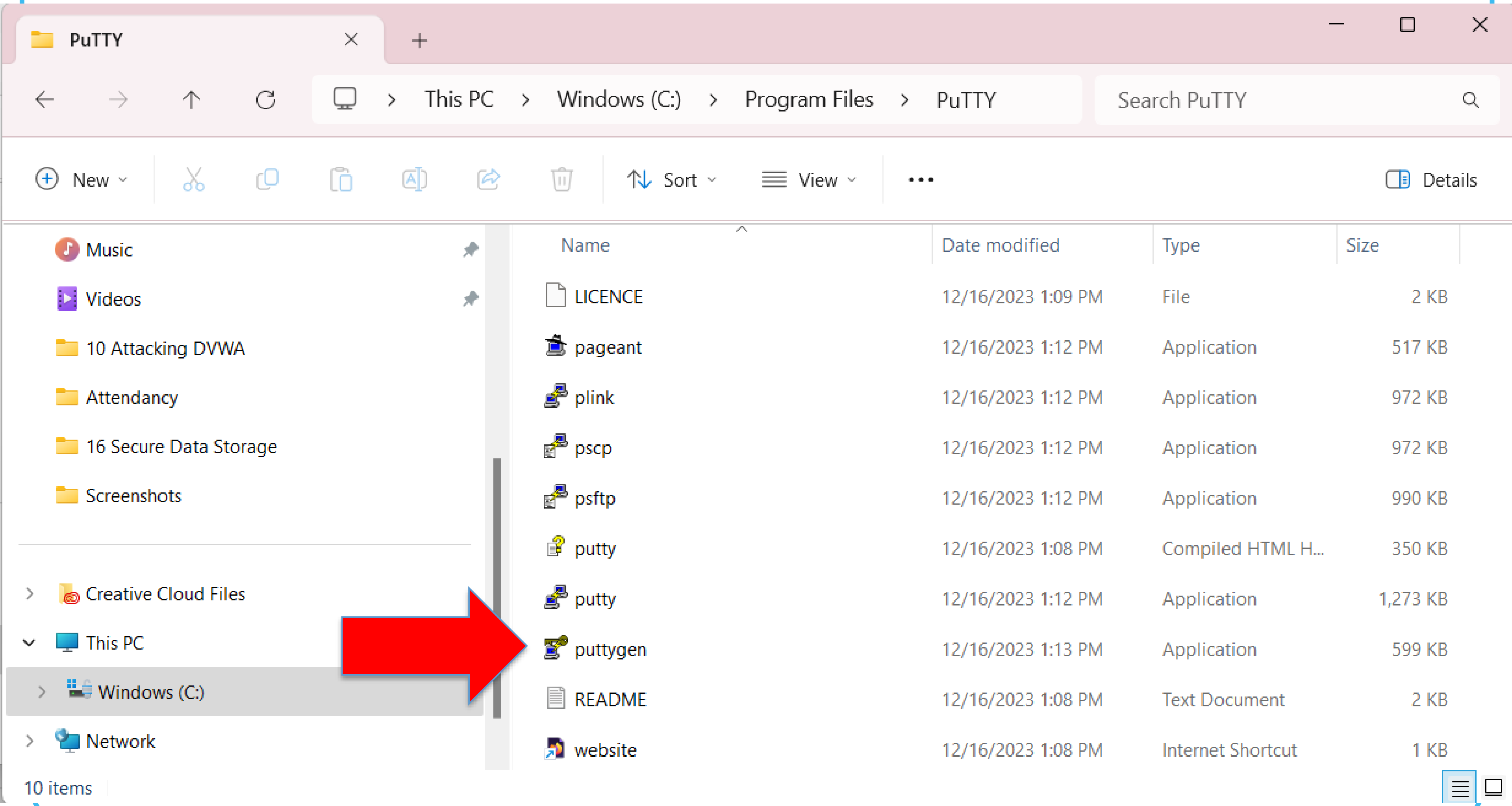
- we have SSH communications between the server and the client
  - the Debian machine acting as a ssh server
  - our host machine acting as a client
- we can look at creating a public/private key combination to enable ssh key authentication.

Install

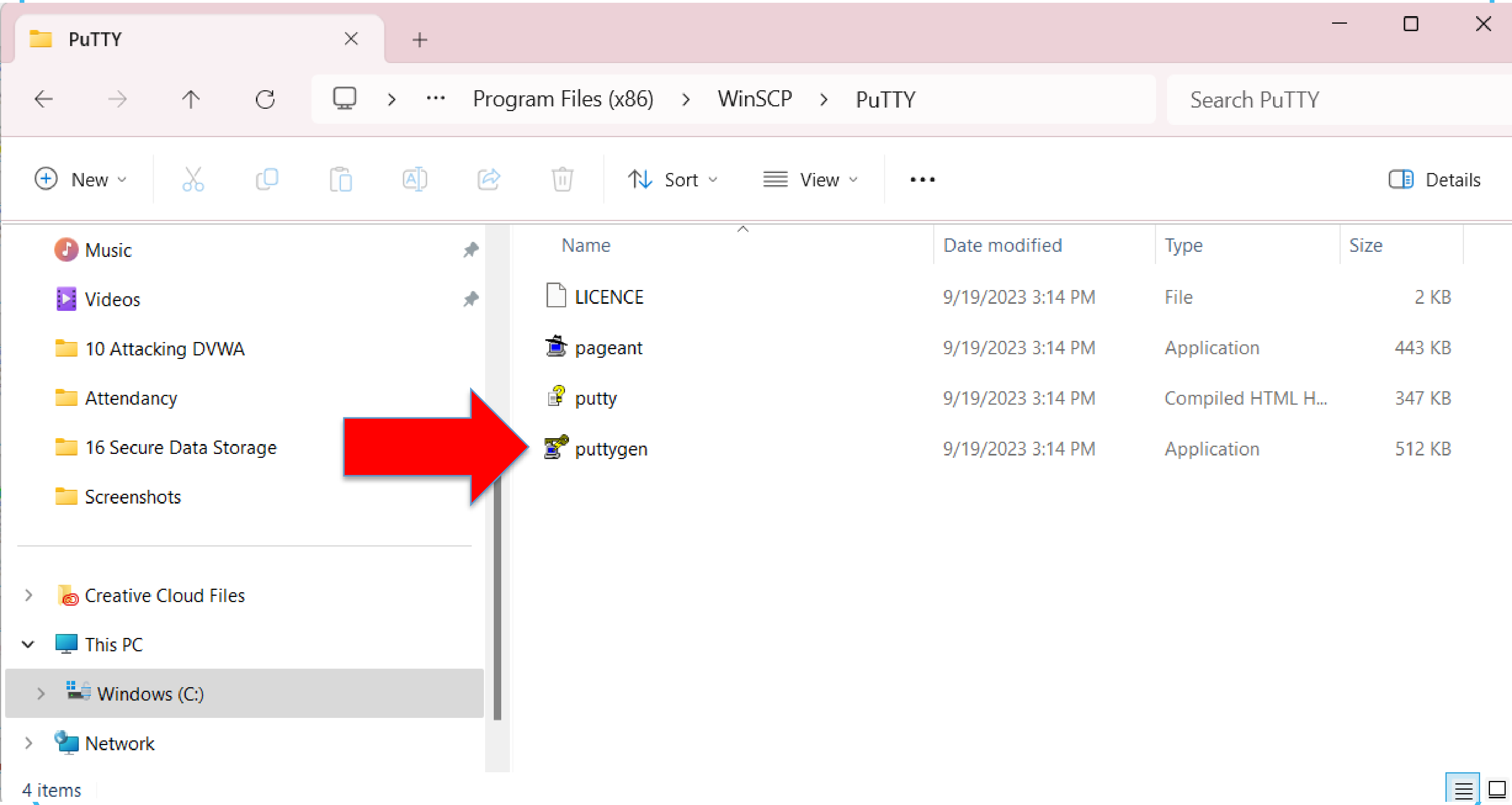
PuTTY Key Generator

Verify Installation

- To verify that PuTTYgen has been installed correctly, you can search for it in the Start menu or simply navigate to the installation directory:
  - C:\Program Files (x86)\WinSCP\PuTTY
  - C:\Program Files\PuTTY
- look for the puttygen.exe file
- PuTTY Key Generator is installed, and you can use it to manage SSH keys



Name	Date modified	Type	Size
LICENCE	12/16/2023 1:09 PM	File	2 KB
pageant	12/16/2023 1:12 PM	Application	517 KB
plink	12/16/2023 1:12 PM	Application	972 KB
pscp	12/16/2023 1:12 PM	Application	972 KB
psftp	12/16/2023 1:12 PM	Application	990 KB
putty	12/16/2023 1:08 PM	Compiled HTML H...	350 KB
putty	12/16/2023 1:12 PM	Application	1,273 KB
puttygen	12/16/2023 1:13 PM	Application	599 KB
README	12/16/2023 1:08 PM	Text Document	2 KB
website	12/16/2023 1:08 PM	Internet Shortcut	1 KB

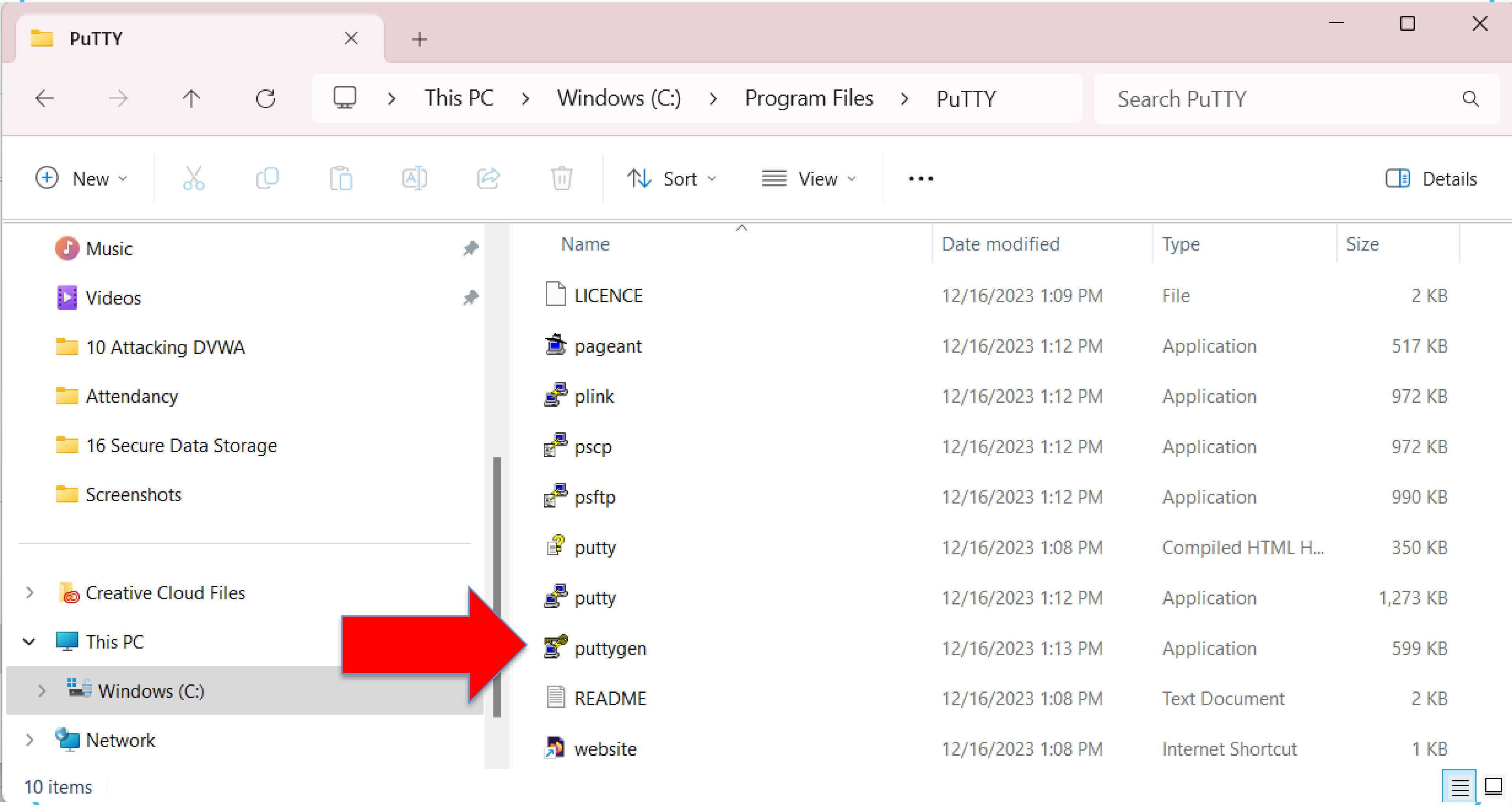


Name	Date modified	Type	Size
LICENCE	9/19/2023 3:14 PM	File	2 KB
pageant	9/19/2023 3:14 PM	Application	443 KB
putty	9/19/2023 3:14 PM	Compiled HTML H...	347 KB
puttygen	9/19/2023 3:14 PM	Application	512 KB

Not sure if you selected PuTTYgen during PuTTY installation

- If you don't find puttygen.exe in the PuTTY installation directory, it's likely that PuTTYgen was not selected for installation during the PuTTY setup process.
- In that case, you may need to reinstall PuTTY and ensure that you select PuTTYgen as one of the components to install.

Double Click on the “puttygen”



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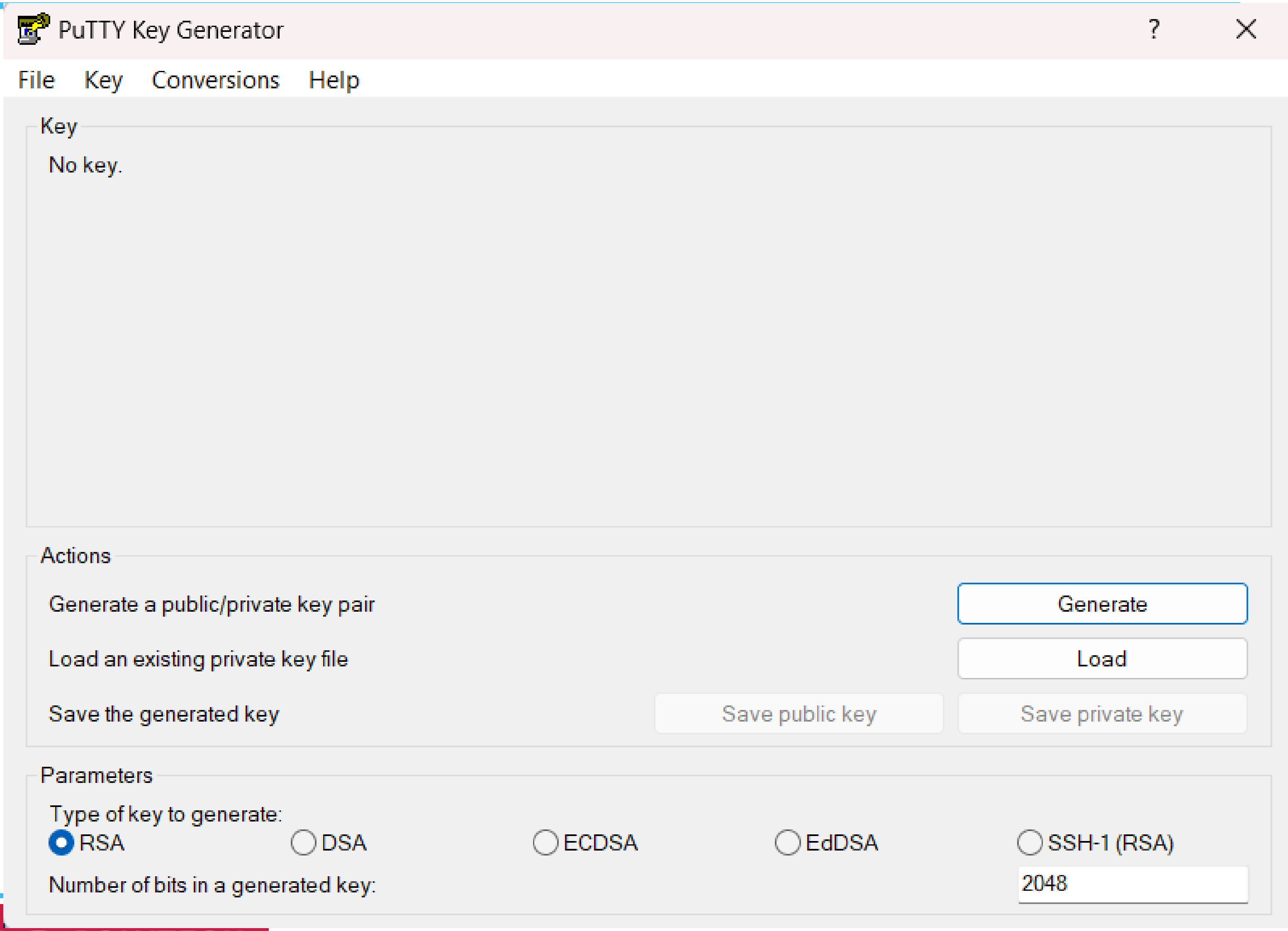
putty	12/16/2023 1:12 PM	Application	1,273 KB
puttygen	12/16/2023 1:13 PM	Application	599 KB
README	12/16/2023 1:08 PM	Text Document	2 KB
website	12/16/2023 1:08 PM	Internet Shortcut	1 KB

The Following Window Is Opened



PuTTY Key Generator

Key

No key.

Actions

Generate a public/private key pair

Load an existing private key file

Save the generated key

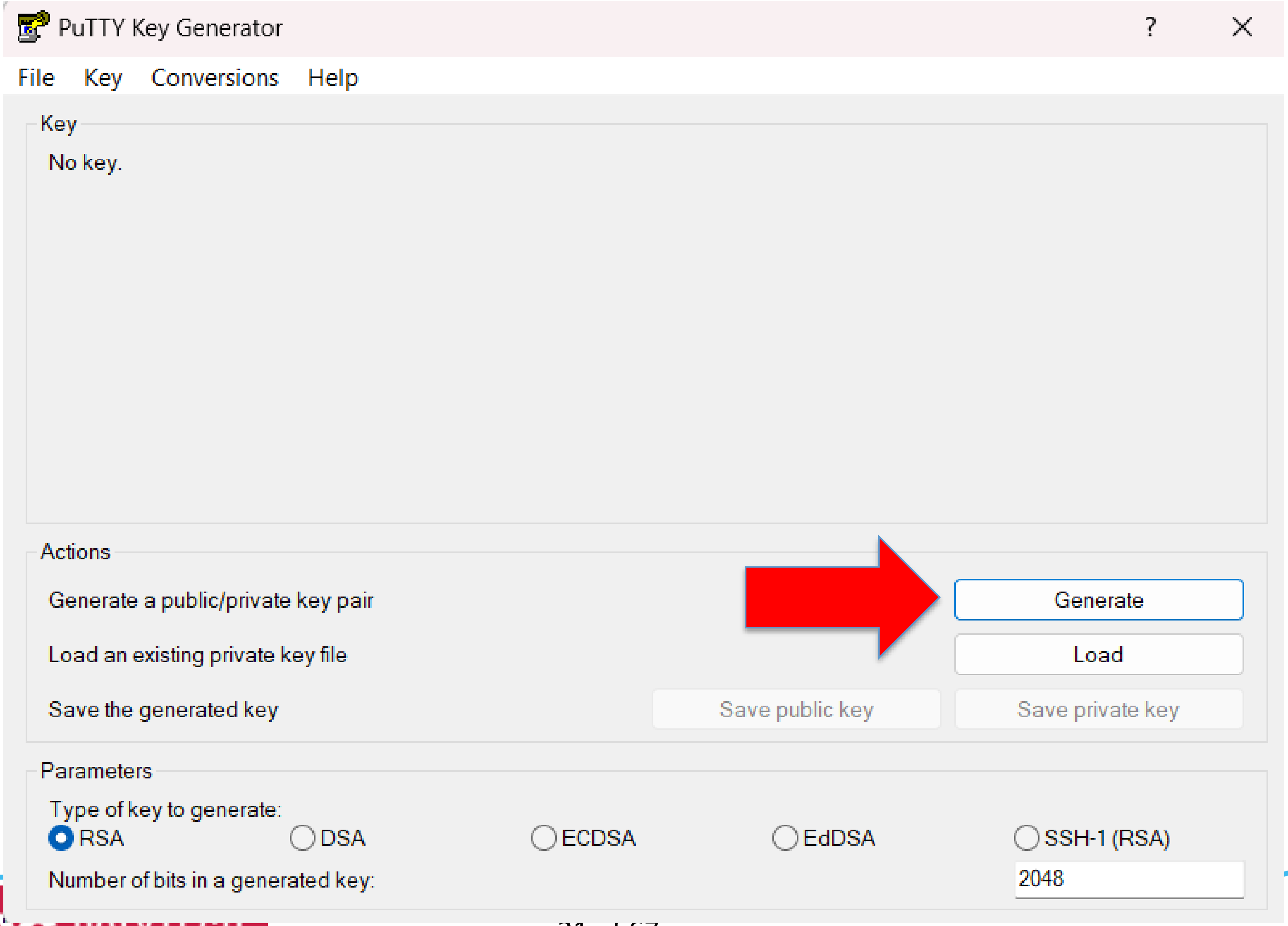
Parameters

Type of key to generate:

● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

Move mouse randomly within the PuTTYgen window to generate entropy



No key.

Generate a public/private key pair

Load an existing private key file

Save the generated key

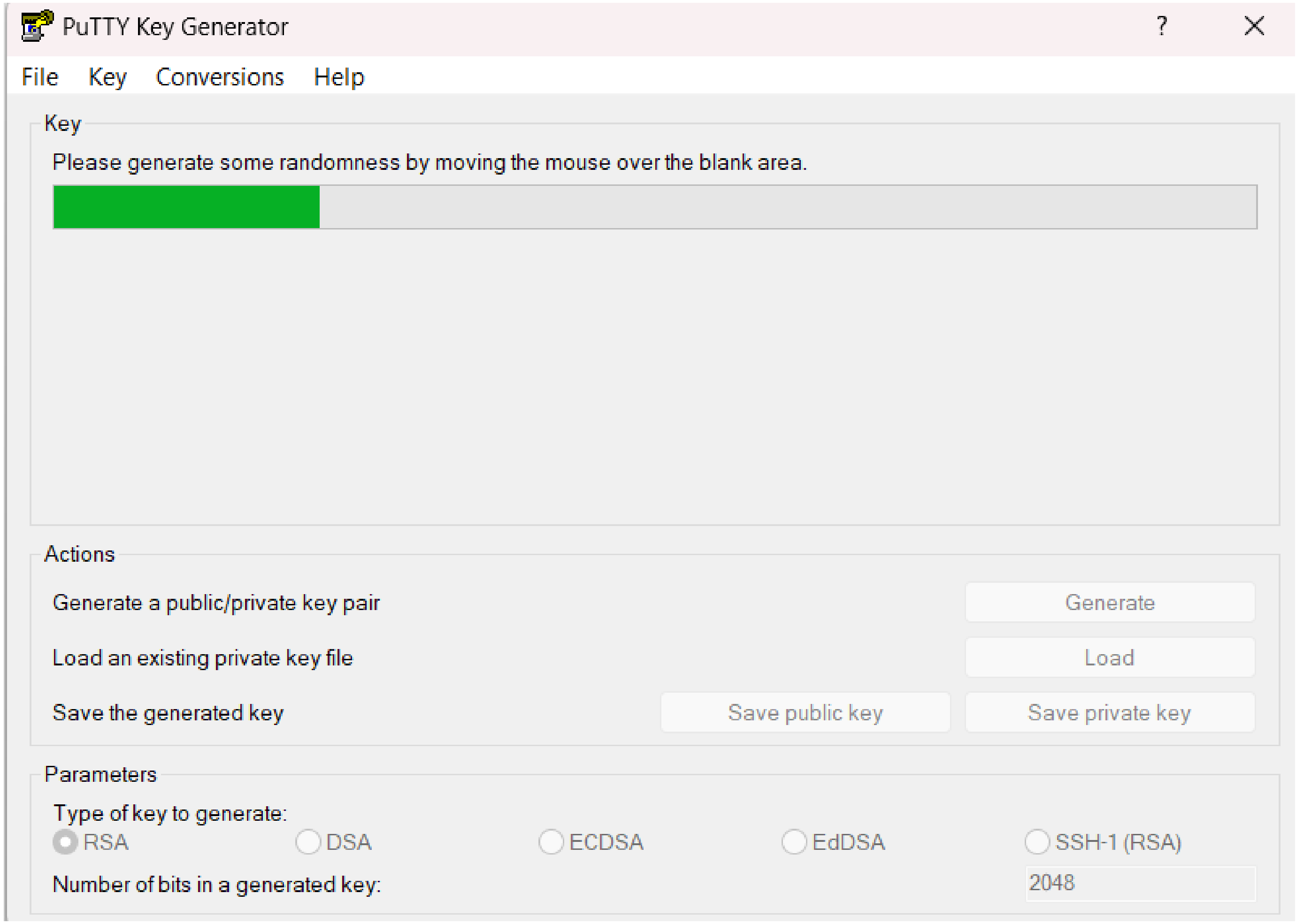
Type of key to generate:
● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

Generate a New SSH Key

- If you need to generate a new SSH key pair, you can do so by selecting the desired key type (such as RSA, DSA, ECDSA, or ED25519) and clicking the "Generate" button.
- Follow the on-screen instructions to move your mouse cursor randomly within the PuTTYgen window to generate entropy, which is used to create a secure key pair.

Generate a New SSH Key



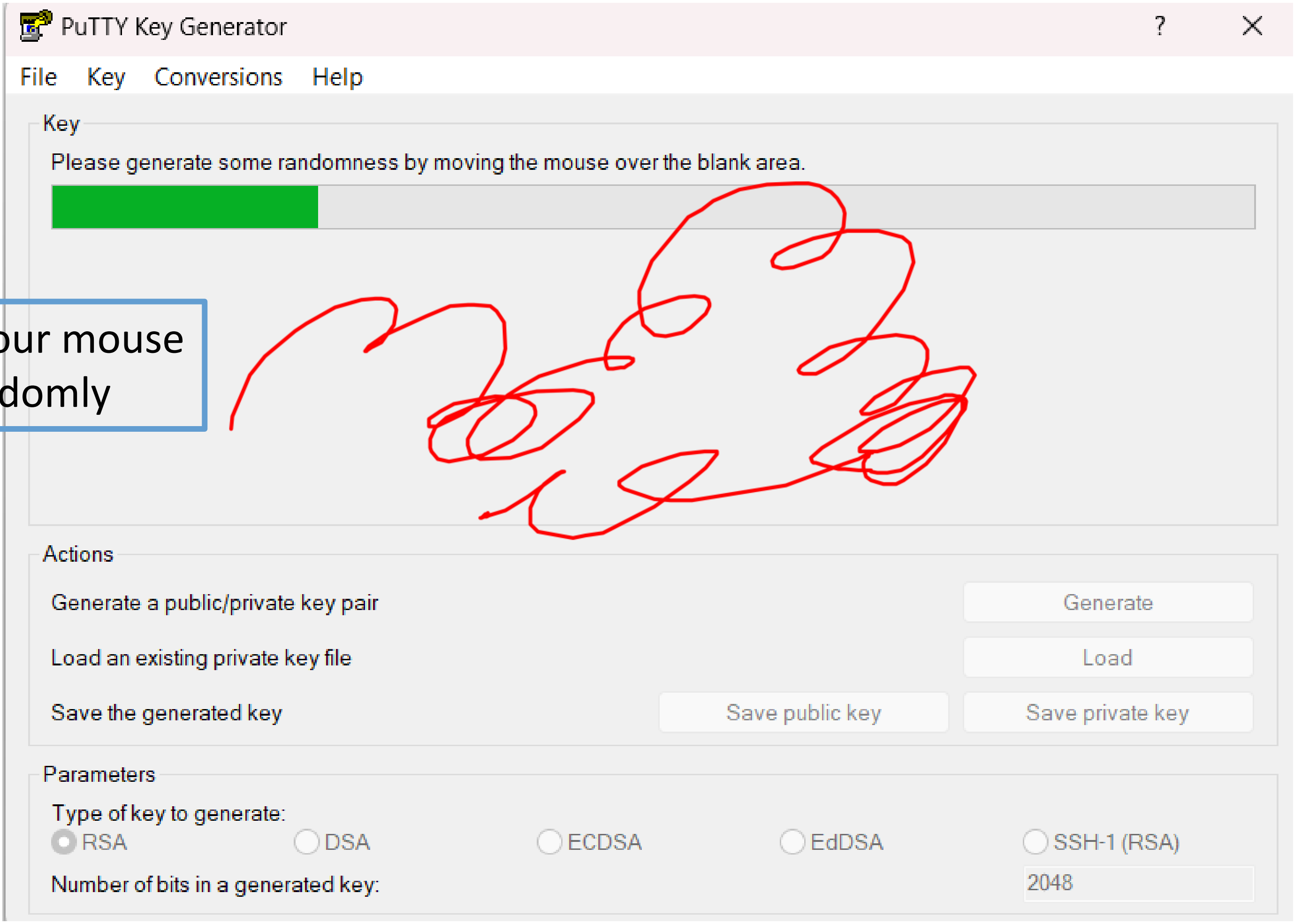
Please generate some randomness by moving the mouse over the blank area.

Type of key to generate:

● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

Generate a New SSH Key



Please generate some randomness by moving the mouse over the blank area.

Generate a public/private key pair

Load an existing private key file

Save the generated key

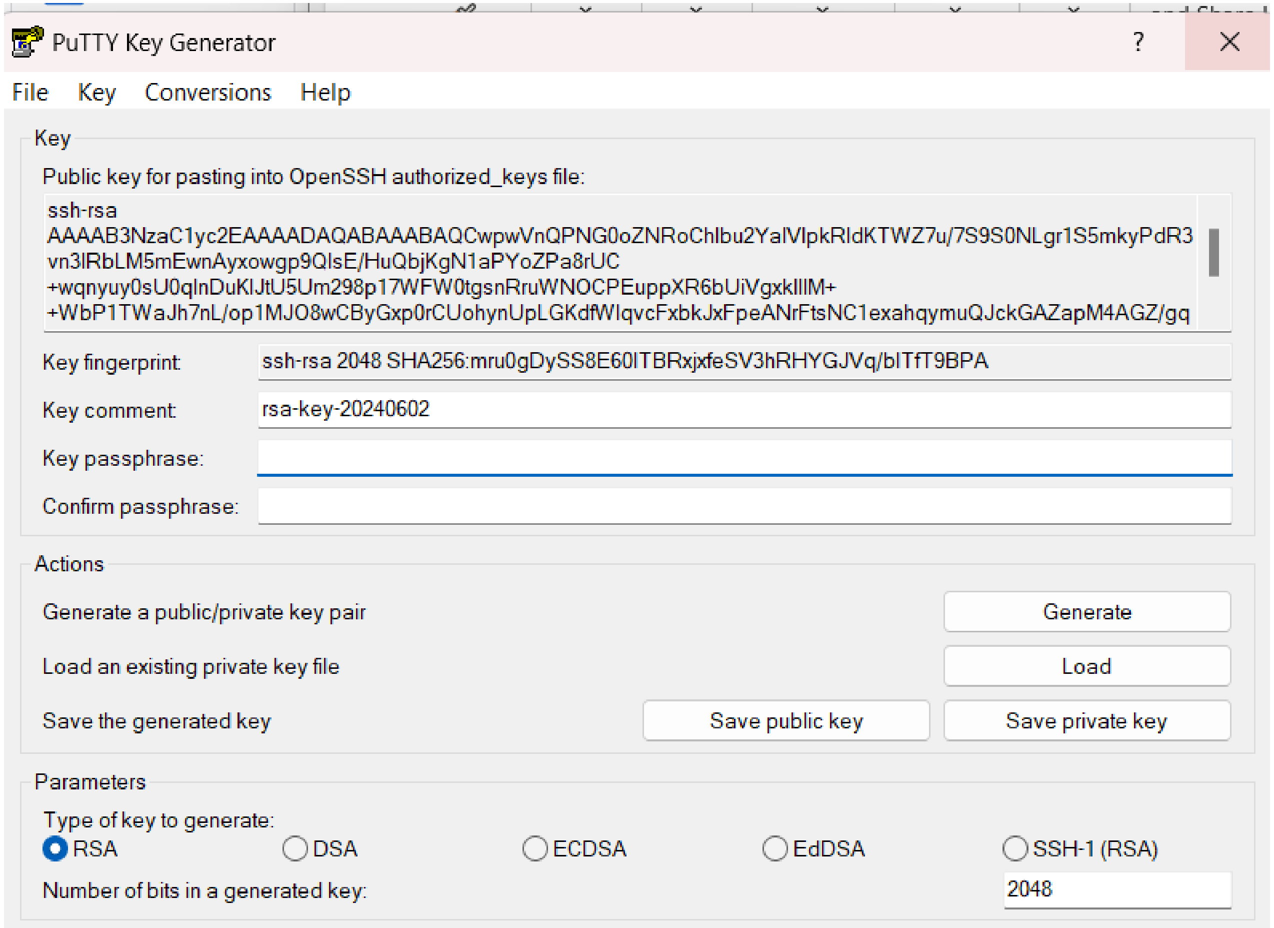
Type of key to generate:

● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

Move your mouse Randomly

Generated SSH Keyes



Key

Public key for pasting into OpenSSH authorized_keys file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCwpwVnQPNG0oZNRoChlbu2YalVlpkRldKTWZ7u/7S9S0NLgr1S5mkyPdR3
vn3lRbLM5mEwnAyxowgp9QlsE/HuQbjKgN1aPYoZPa8rUC
+wqnyuy0sU0qlnDuKlJtU5Um298p17WFW0tgsnRruWNOCPEuppXR6bUiVgxkIllM+
+WbP1TWaJh7nL/op1MJO8wCByGxp0rCUohynUpLGKdfWIqvcFxbkJxFpeANrFtsNC1exahqymuQJckGAZapM4AGZ/gq
```

Key fingerprint: ssh-rsa 2048 SHA256:mru0gDySS8E60ITBRxjxfeSV3hRHYGJVq/bITfT9BPA

Key comment: rsa-key-20240602

Key passphrase:

Confirm passphrase:

Actions

Generate a public/private key pair

Load an existing private key file

Save the generated key

Parameters

Type of key to generate:

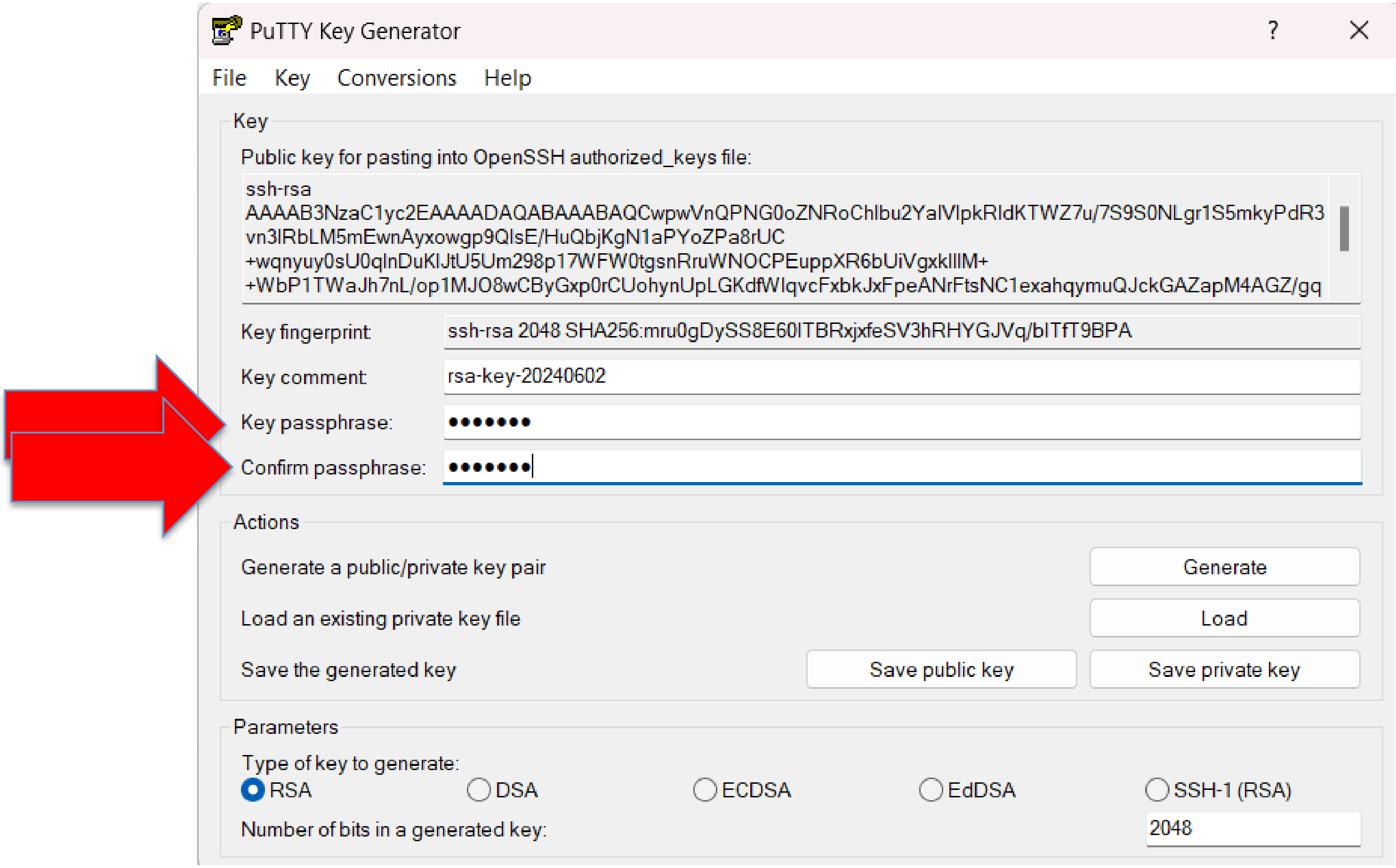
● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

Save the SSH Key Pair

- Once the key pair is generated, you can optionally provide a passphrase to encrypt the private key for added security.

Add Key passphrase



Key

Public key for pasting into OpenSSH authorized_keys file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCwpwVnQPNG0oZNRoChlbu2YalVlpkRldKTWZ7u/7S9S0NLgr1S5mkyPdR3
vn3lRbLM5mEwnAyxowgp9QlsE/HuQbjKgN1aPYoZPa8rUC
+wqnyuy0sU0qlnDuKlJtU5Um298p17WFW0tgsnRruWNOCPEuppXR6bUiVgxklllM+
+WbP1TWaJh7nL/op1MJO8wCByGxp0rCUohynUpLGKdfWlqvcFxbkJxFpeANrFtsNC1exahqymuQJckGAZapM4AGZ/gq
```

Key fingerprint: ssh-rsa 2048 SHA256:mru0gDySS8E60ITBRxjxfeSV3hRHYGJVq/bITfT9BPA

Key comment: rsa-key-20240602

Key passphrase: •••••••

Confirm passphrase: •••••••

Actions

Generate a public/private key pair

Load an existing private key file

Save the generated key

Parameters

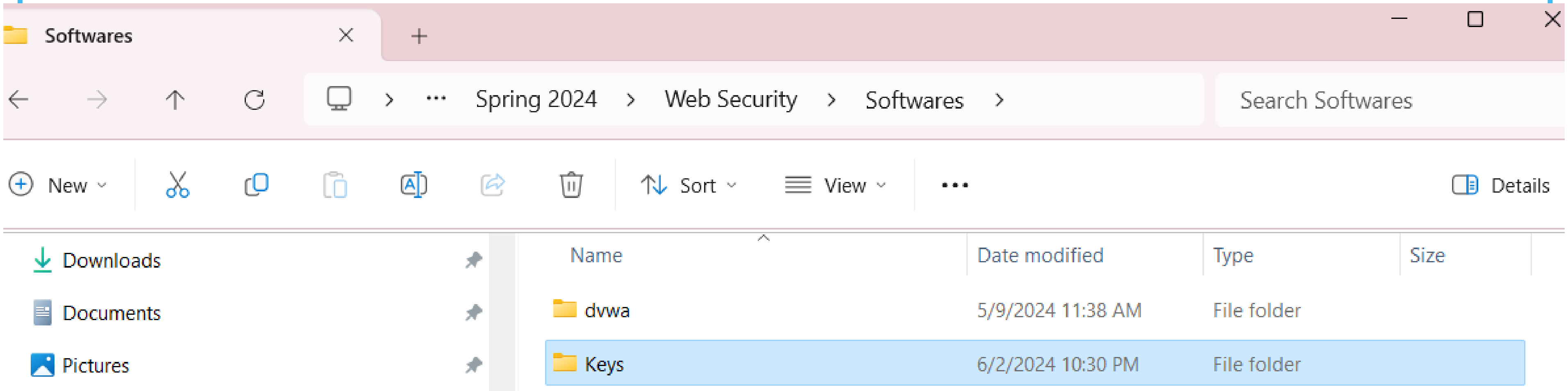
Type of key to generate:
● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

Save the SSH Key Pair

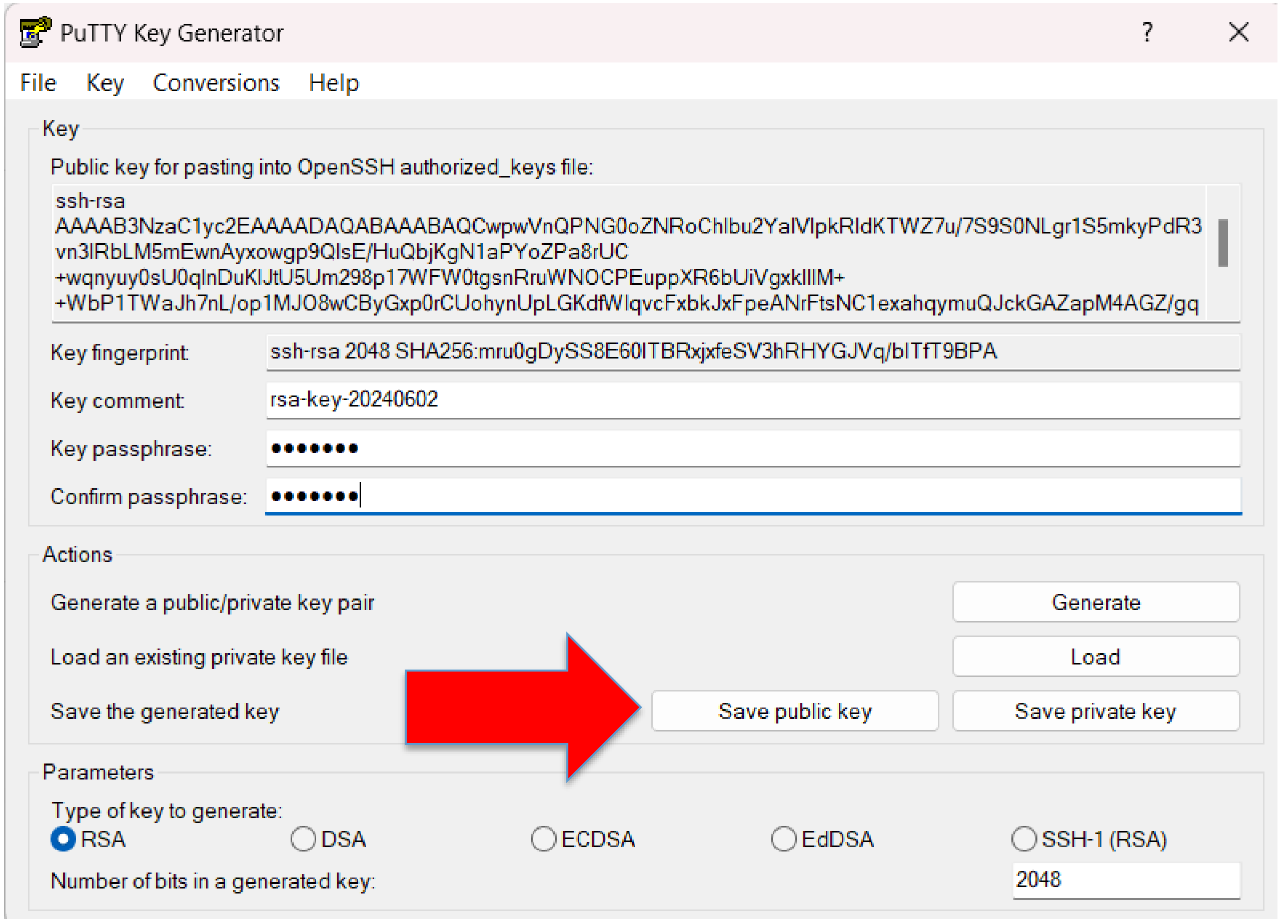
- You can also click the "Save public key" button to save the corresponding public key.
- You can click the "Save private key" button to save the private key to a file on your computer.

Create a Folder in Software to Save Public Key and Private Key



Name	Date modified	Type	Size
dvwa	5/9/2024 11:38 AM	File folder	
Keys	6/2/2024 10:30 PM	File folder	

Save Public Key



Key

Public key for pasting into OpenSSH authorized_keys file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCwpwVnQPNG0oZNRoChlbu2YalVlpkRldKTWZ7u/7S9S0NLgr1S5mkyPdR3
vn3lRbLM5mEwnAyxowgp9QlsE/HuQbjKgN1aPYoZPa8rUC
+wqnyuy0sU0qlnDuKlJtU5Um298p17WFW0tgsnRruWNOCPEuppXR6bUiVgxklllM+
+WbP1TWaJh7nL/op1MJO8wCByGxp0rCUohynUpLGKdfWlqvcFxbkJxFpeANrFtsNC1exahqymuQJckGAZapM4AGZ/gq
```

Key fingerprint: ssh-rsa 2048 SHA256:mru0gDySS8E60ITBRxjxfeSV3hRHYGJVq/bITfT9BPA

Key comment: rsa-key-20240602

Key passphrase: ●●●●●●●

Confirm passphrase: ●●●●●●●

Actions

Generate a public/private key pair

Load an existing private key file

Save the generated key

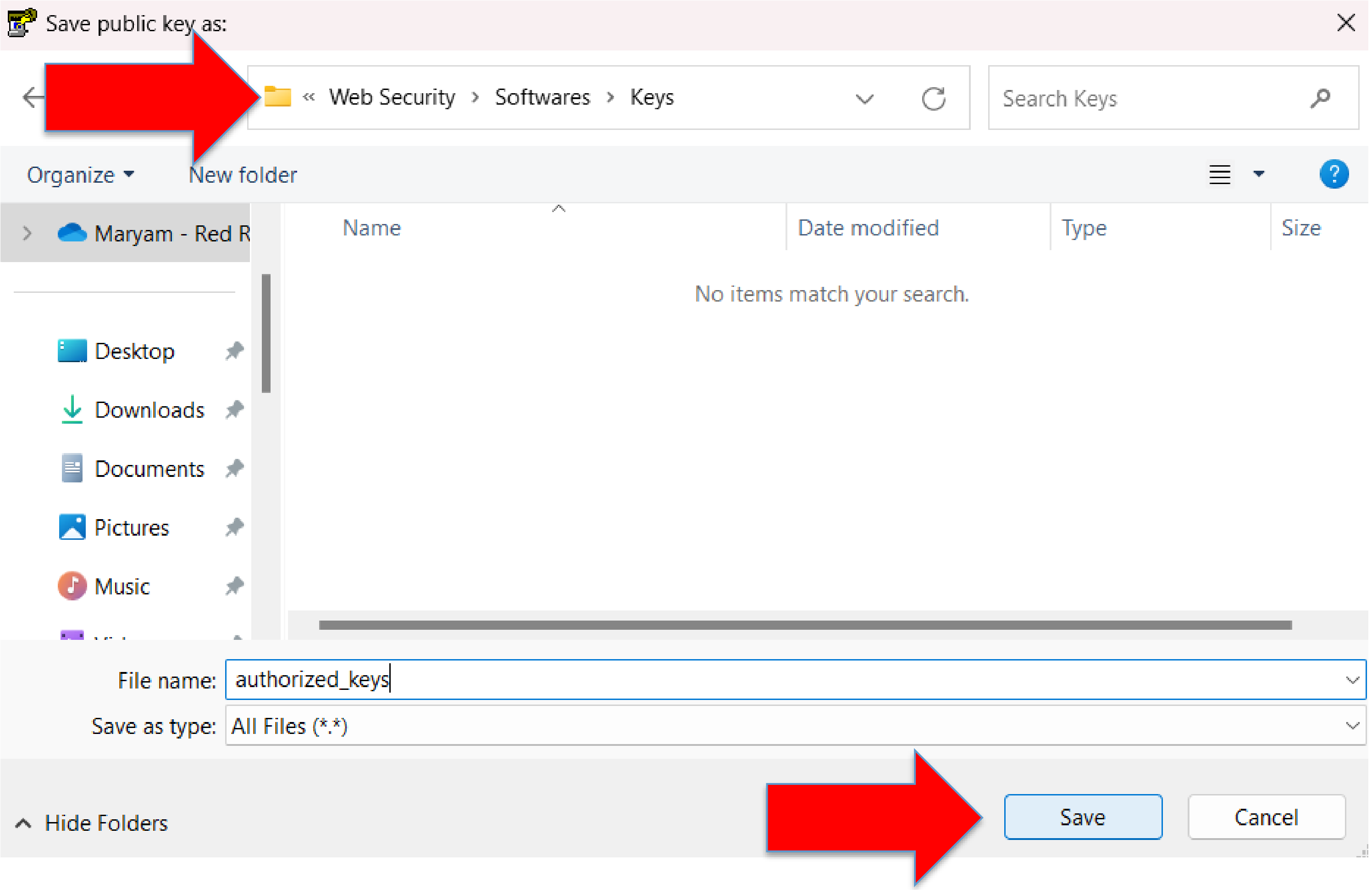
Parameters

Type of key to generate:

● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

Path to Save Public Key: `authorized_keys`



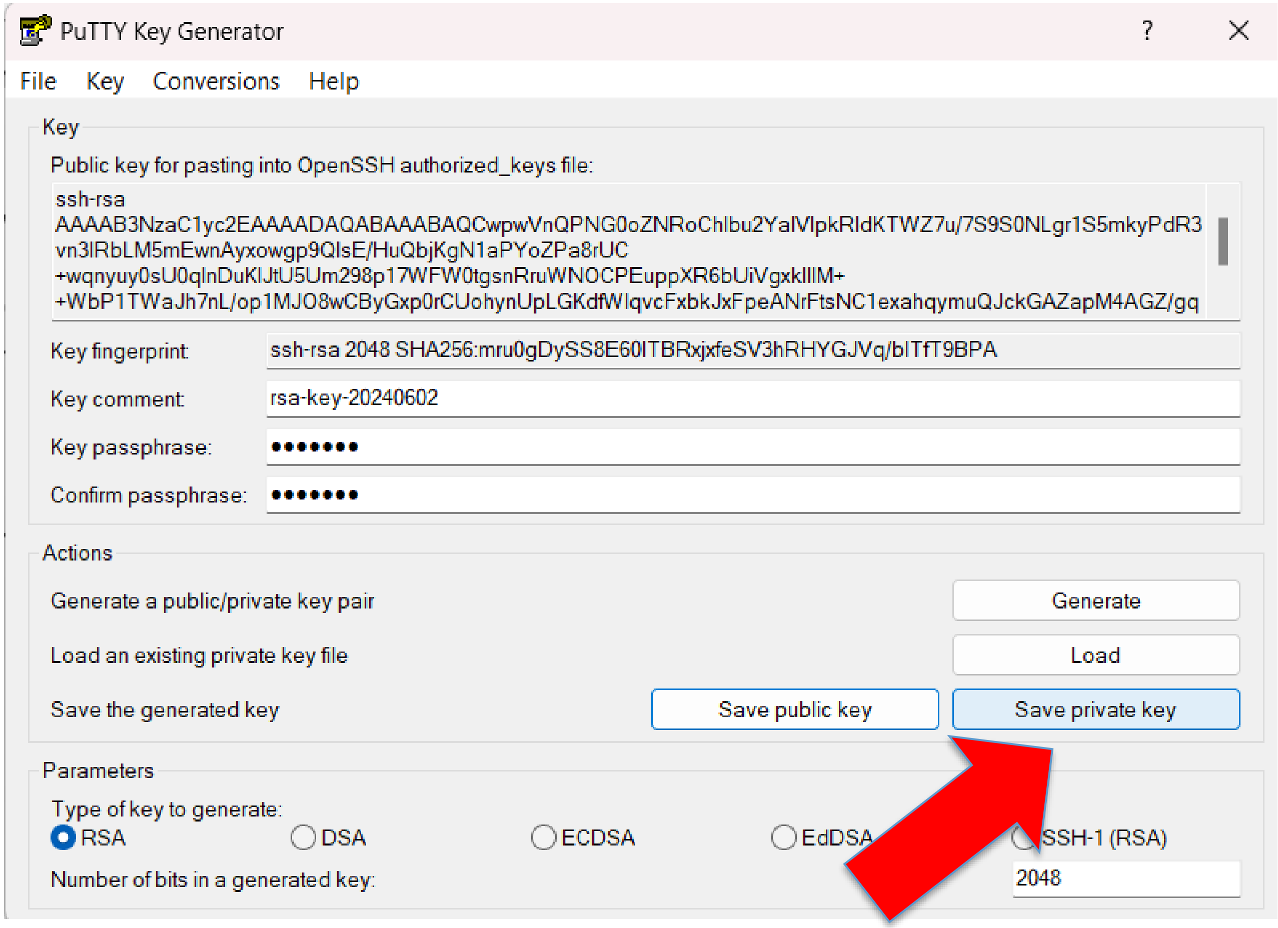
Save public key as:

« Web Security › Softwares › Keys

File name: authorized_keys

Save as type: All Files (*.*)

Save Private Key



Key

Public key for pasting into OpenSSH authorized_keys file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCwpwVnQPNG0oZNRoChlbu2YalVlpkRldKTWZ7u/7S9S0NLgr1S5mkyPdR3
vn3lRbLM5mEwnAyxowgp9QlsE/HuQbjKgN1aPYoZPa8rUC
+wqnyuy0sU0qlnDuKlJtU5Um298p17WFW0tgsnRruWNOCPEuppXR6bUiVgxklllM+
+WbP1TWaJh7nL/op1MJO8wCByGxp0rCUohynUpLGKdfWlqvcFxbkJxFpeANrFtsNC1exahqymuQJckGAZapM4AGZ/gq
```

Key fingerprint: ssh-rsa 2048 SHA256:mru0gDySS8E60ITBRxjxfeSV3hRHYGJVq/bITfT9BPA

Key comment: rsa-key-20240602

Key passphrase: ●●●●●●●

Confirm passphrase: ●●●●●●●

Actions

Generate a public/private key pair — Generate

Load an existing private key file — Load

Save the generated key — Save public key — Save private key

Parameters

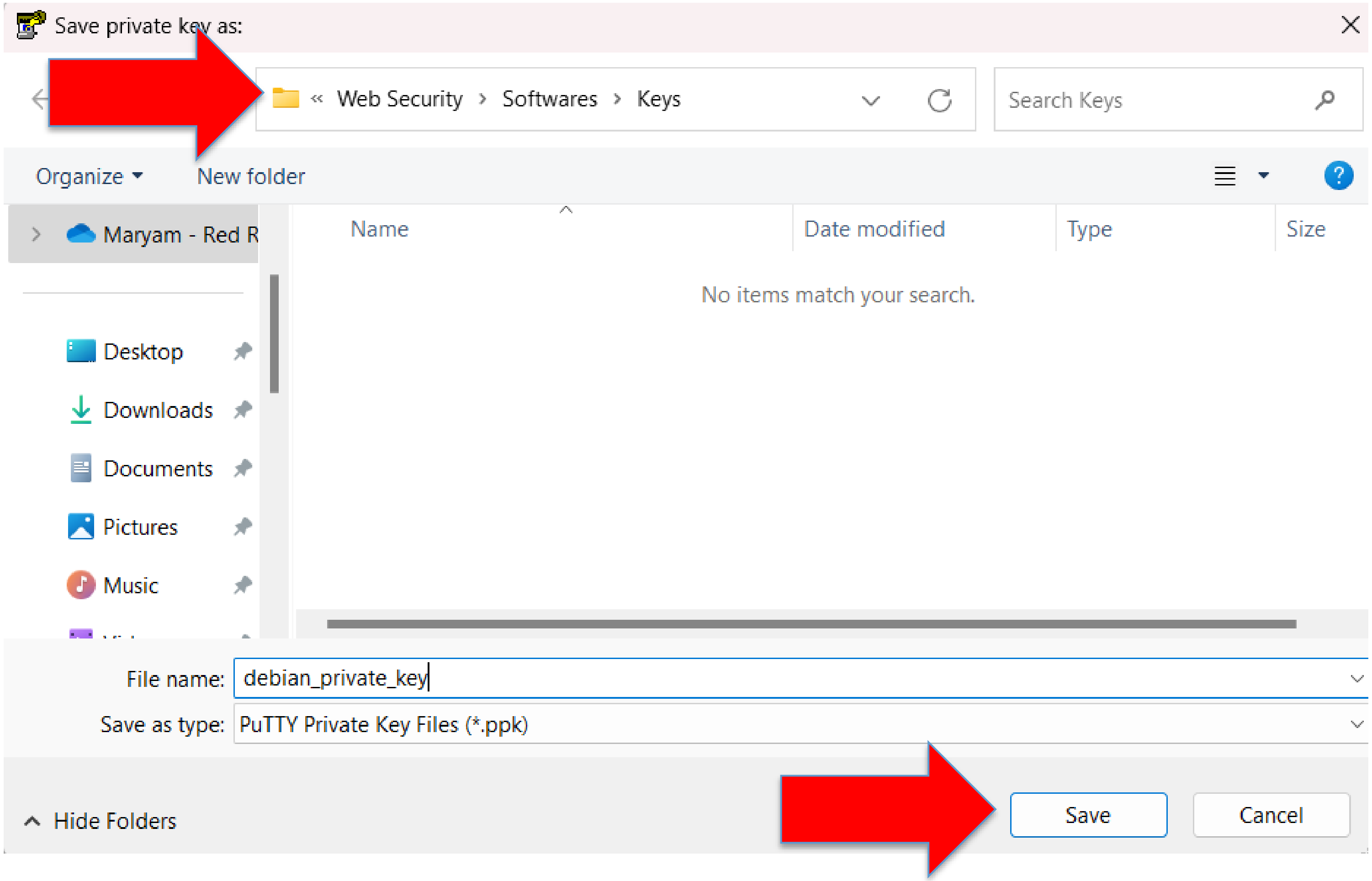
Type of key to generate:

● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

Path to Save Private Key:

debian_private_key



Save private key as:

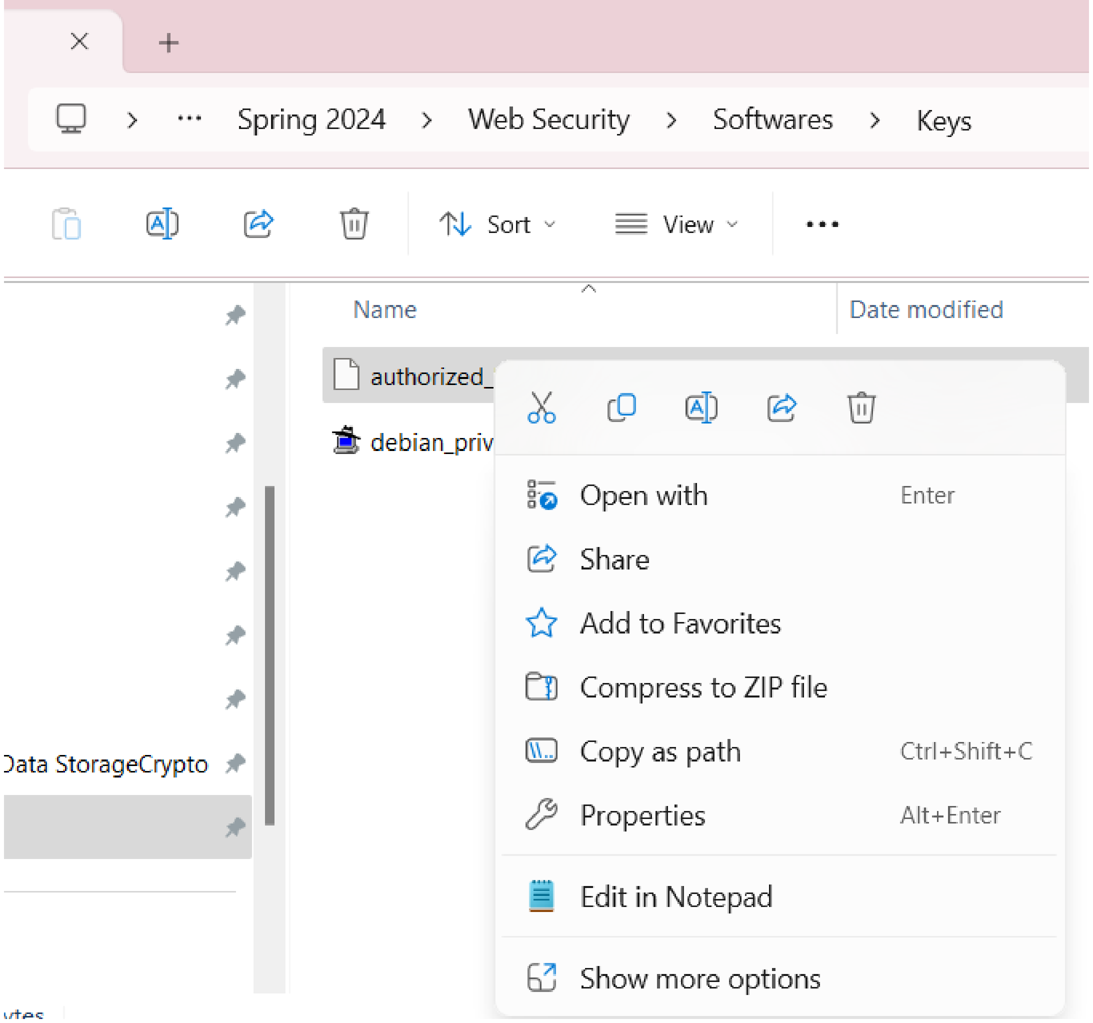
File name: debian_private_key

Save as type: PuTTY Private Key Files (*.ppk)

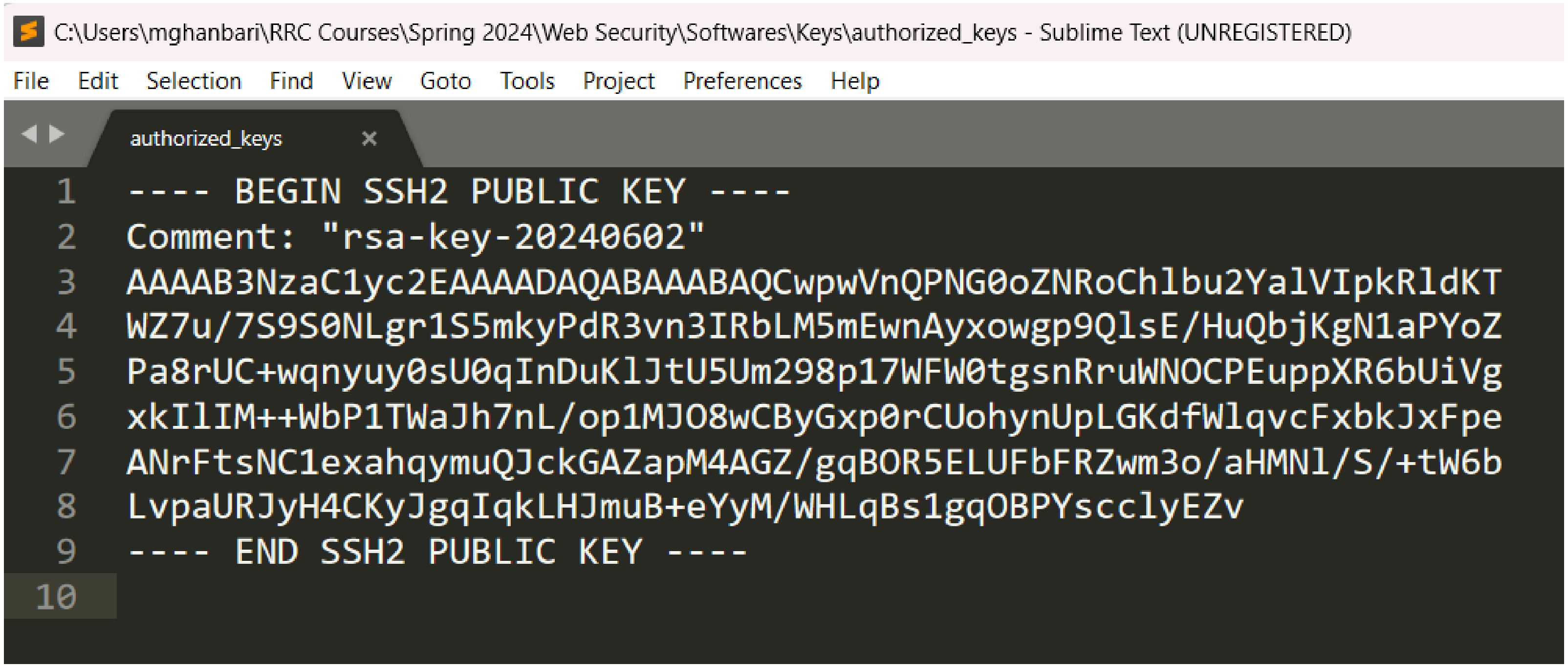
Problem

- Unfortunately, the format of the public key is wrong for Debian. We need to update the content of our “authorized_keys” file with the public key.

Open “authorized_keys” in an Editor



The content of “authorized_keys” File

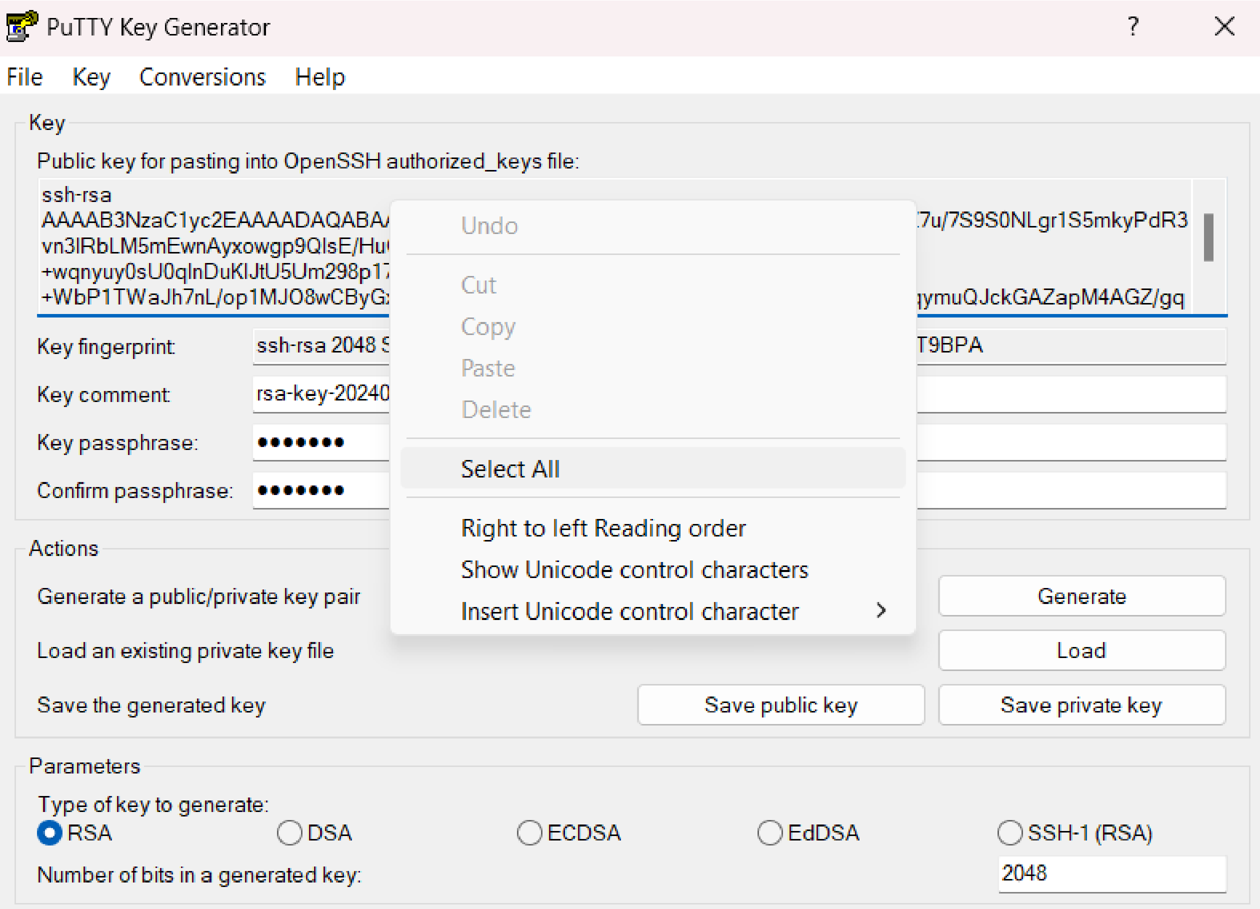

C:\Users\mghanbari\RRC Courses\Spring 2024\Web Security\Softwares\Keys\authorized_keys - Sublime Text (UNREGISTERED)
File
Edit
Selection
Find
View
Goto
Tools
Project
Preferences
Help
authorized_keys ×

```
---- BEGIN SSH2 PUBLIC KEY ----
Comment: "rsa-key-20240602"
AAAAB3NzaC1yc2EAAAADAQABAAABAQCwpwVnQPNG0oZNRoChlbu2YalVIpkRldKT
WZ7u/7S9S0NLgr1S5mkyPdR3vn3IRbLM5mEwnAyxowgp9QlsE/HuQbjKgN1aPYoZ
Pa8rUC+wqnyuy0sU0qInDuKlJtU5Um298p17WFW0tgsnRruWNOCPEuppXR6bUiVg
xkIlIM++WbP1TWaJh7nL/op1MJO8wCByGxp0rCUohynUpLGKdfWlqvcFxbkJxFpe
ANrFtsNC1exahqymuQJckGAZapM4AGZ/gqBOR5ELUFbFRZwm3o/aHMNl/S/+tW6b
LvpaURJyH4CKyJgqIqkLHJmuB+eYyM/WHLqBs1gqOBPYscclyEZv
---- END SSH2 PUBLIC KEY ----

```

Open PuTTY Key Generator

- Hit “select All”



Key

Public key for pasting into OpenSSH authorized_keys file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABA           7u/7S9S0NLgr1S5mkyPdR3
vn3lRbLM5mEwnAyxowgp9QlsE/Hu
+wqnyuy0sU0qlnDuKlJtU5Um298p17
+WbP1TWaJh7nL/op1MJO8wCByG           ymuQJckGAZapM4AGZ/gq
```

Key fingerprint: ssh-rsa 2048 S … T9BPA

Key comment: rsa-key-20240

Key passphrase: ●●●●●●●

Confirm passphrase: ●●●●●●●

Actions

Generate a public/private key pair

Load an existing private key file

Save the generated key

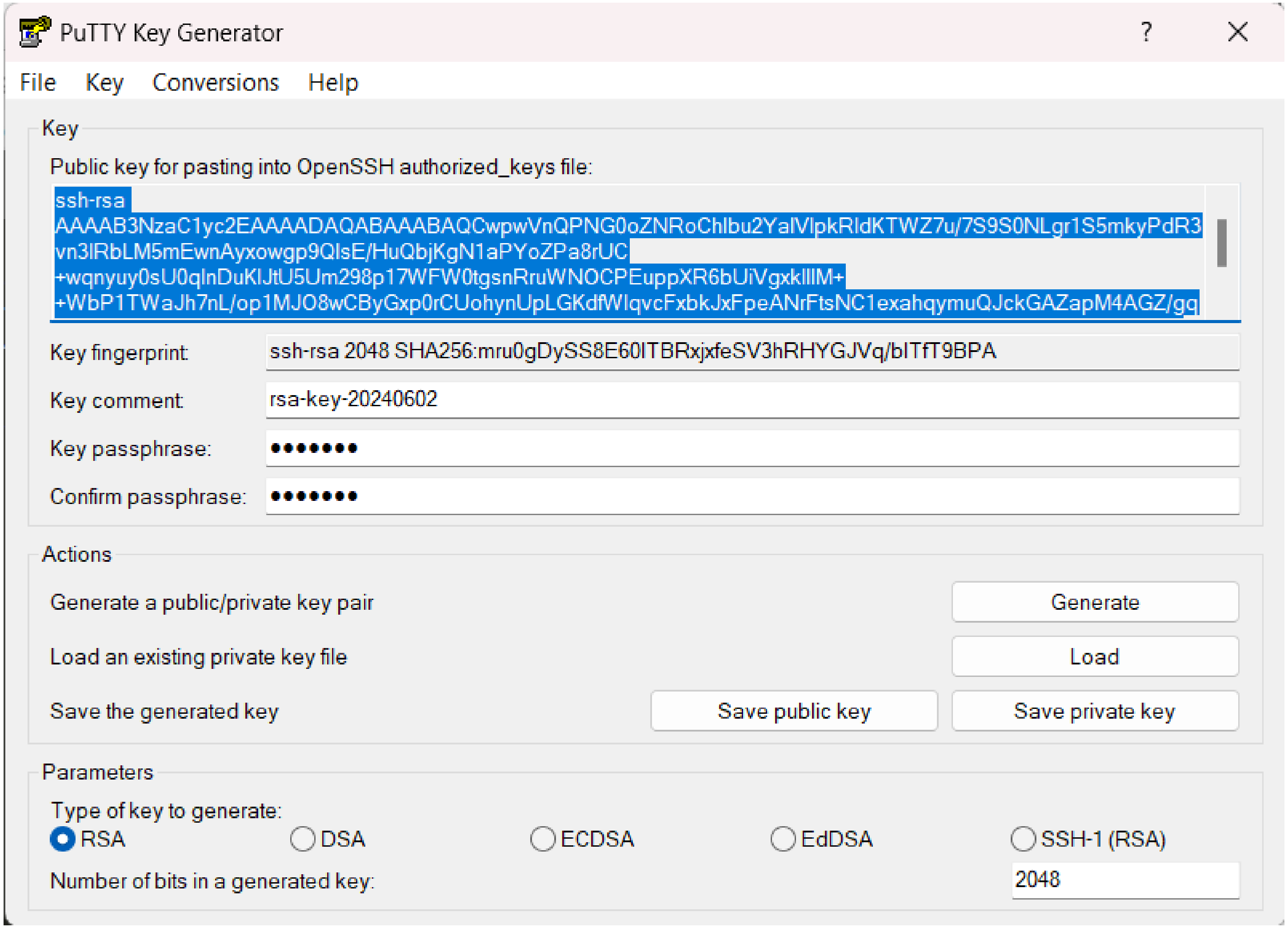
Parameters

Type of key to generate:

● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

In PuTTY Key Generator: select all



Key

Public key for pasting into OpenSSH authorized_keys file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCwpwVnQPNG0oZNRoChlbu2YalVlpkRldKTWZ7u/7S9S0NLgr1S5mkyPdR3
vn3lRbLM5mEwnAyxowgp9QIsE/HuQbjKgN1aPYoZPa8rUC
+wqnyuy0sU0qlnDuKlJtU5Um298p17WFW0tgsnRruWNOCPEuppXR6bUiVgxklllM+
+WbP1TWaJh7nL/op1MJO8wCByGxp0rCUohynUpLGKdfWIqvcFxbkJxFpeANrFtsNC1exahqymuQJckGAZapM4AGZ/gq
```

Key fingerprint: ssh-rsa 2048 SHA256:mru0gDySS8E60ITBRxjxfeSV3hRHYGJVq/bITfT9BPA

Key comment: rsa-key-20240602

Key passphrase: ●●●●●●●

Confirm passphrase: ●●●●●●●

Actions

Generate a public/private key pair

Load an existing private key file

Save the generated key

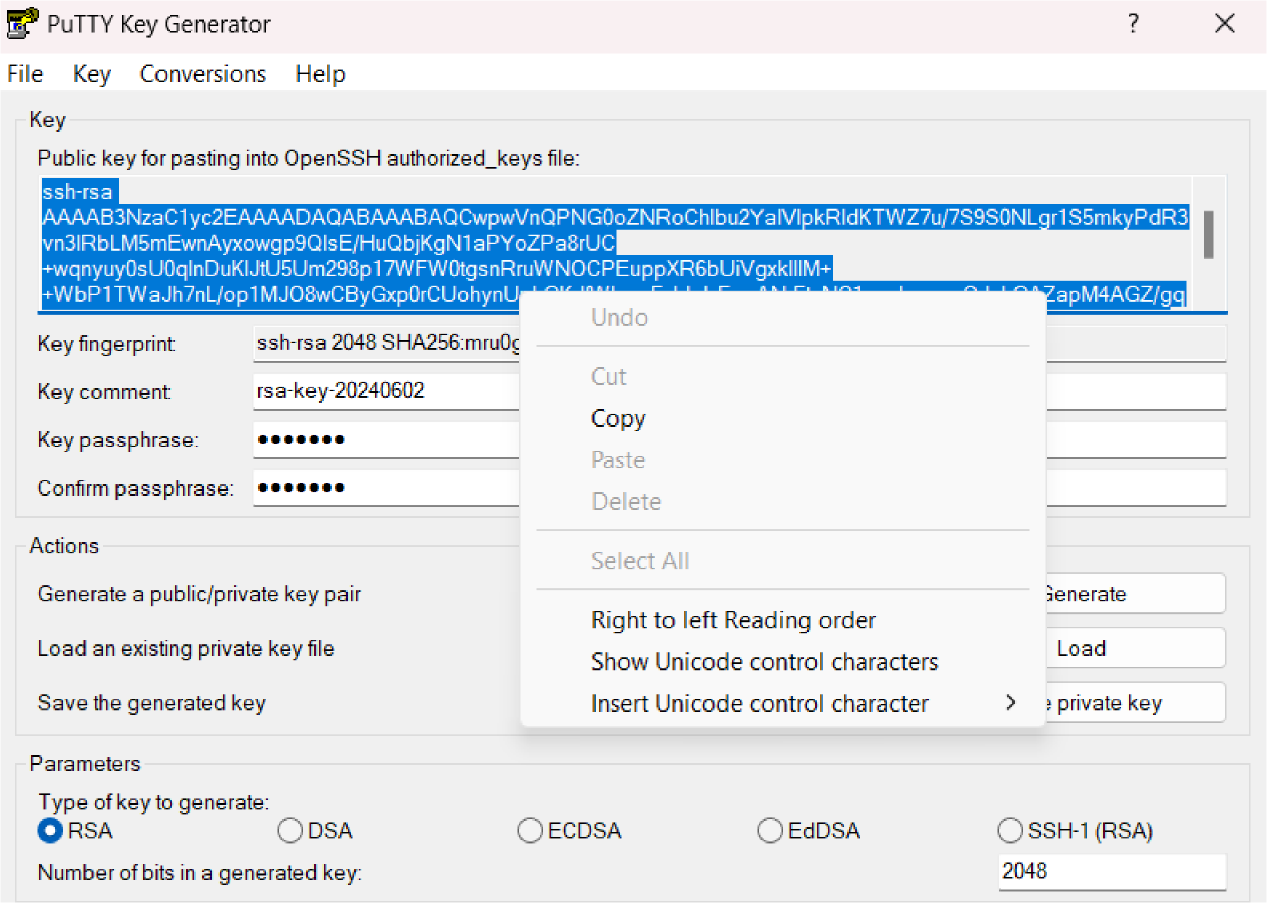
Parameters

Type of key to generate:

● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

Number of bits in a generated key: 2048

In PuTTY Key Generator: copy



Public key for pasting into OpenSSH authorized_keys file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCwpwVnQPNG0oZNRoChlbu2YalVlpkRldKTWZ7u/7S9S0NLgr1S5mkyPdR3
vn3lRbLM5mEwnAyxowgp9QlsE/HuQbjKgN1aPYoZPa8rUC
+wqnyuy0sU0qlnDuKlJtU5Um298p17WFW0tgsnRruWNOCPEuppXR6bUiVgxklllM+
+WbP1TWaJh7nL/op1MJO8wCByGxp0rCUohynU ZapM4AGZ/gq
```

Key fingerprint: ssh-rsa 2048 SHA256:mru0g

Key comment: rsa-key-20240602

Key passphrase: •••••••

Confirm passphrase: •••••••

Undo
Cut
Copy
Paste
Delete
Select All
Right to left Reading order
Show Unicode control characters
Insert Unicode control character ›
Actions

Generate a public/private key pair

Load an existing private key file

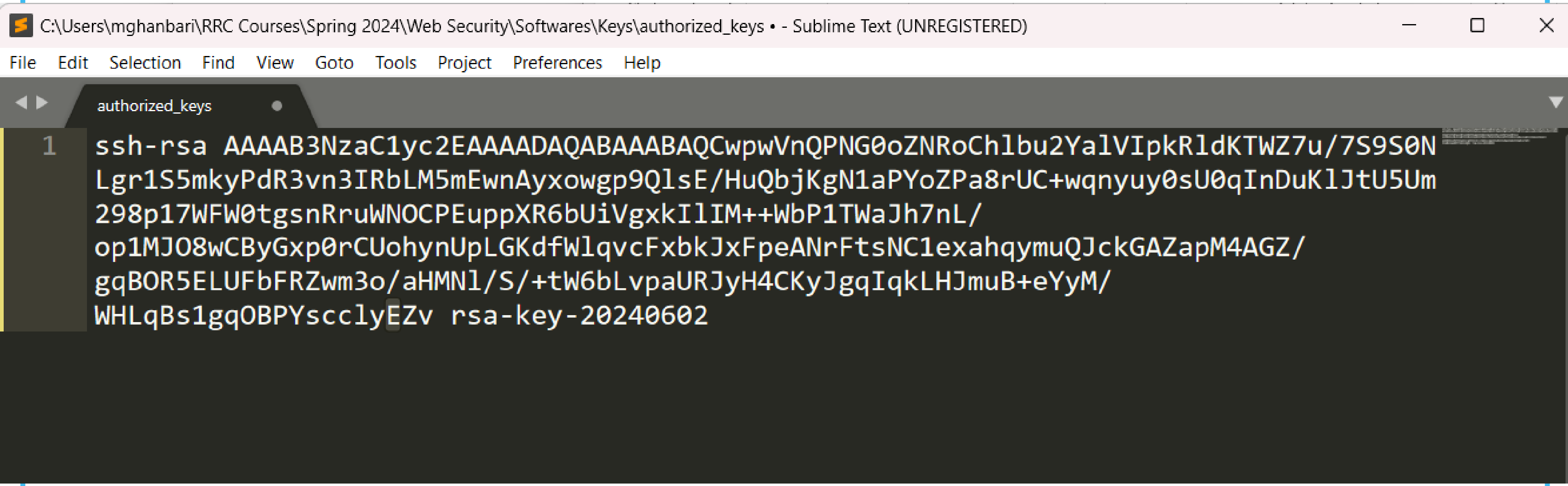
Save the generated key

Type of key to generate:

● RSA ○ DSA ○ ECDSA ○ EdDSA ○ SSH-1 (RSA)

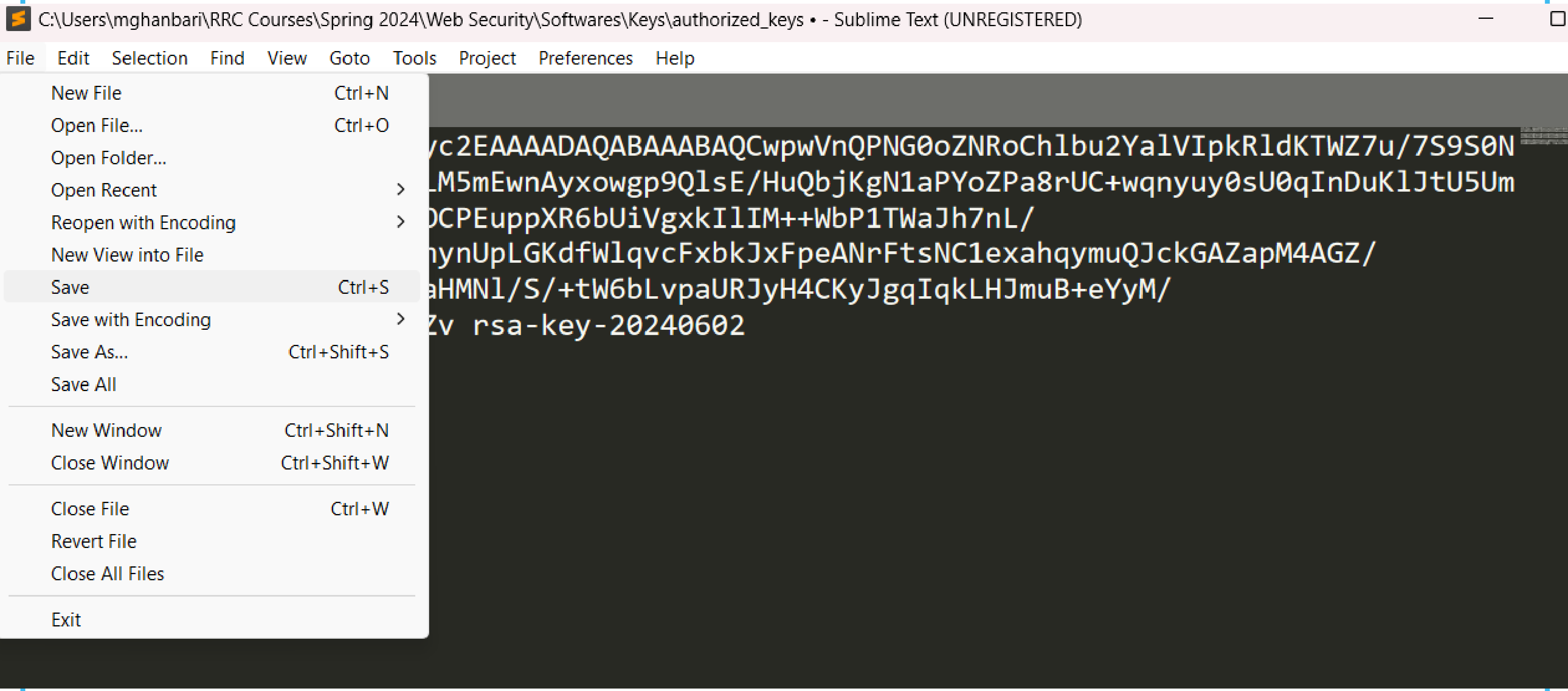
Number of bits in a generated key: 2048

Delete the content of “authorized_keys” File and paste the Public Key from PuTTY Key Generator


C:\Users\mghanbari\RRC Courses\Spring 2024\Web Security\Softwares\Keys\authorized_keys • - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
authorized_keys

```
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQCwpwVnQPNG0oZNRoChlbu2YalVIpkRldKTWZ7u/7S9S0N
Lgr1S5mkyPdR3vn3IRbLM5mEwnAyxowgp9QlsE/HuQbjKgN1aPYoZPa8rUC+wqnyuy0sU0qInDuKlJtU5Um
298p17WFW0tgsnRruWNOCPEuppXR6bUiVgxkIlIM++WbP1TWaJh7nL/
op1MJO8wCByGxp0rCUohynUpLGKdfWlqvcFxbkJxFpeANrFtsNC1exahqymuQJckGAZapM4AGZ/
gqBOR5ELUFbFRZwm3o/aHMNl/S/+tW6bLvpaURJyH4CKyJgqIqkLHJmuB+eYyM/
WHLqBs1gqOBPYscclyEZv rsa-key-20240602
```

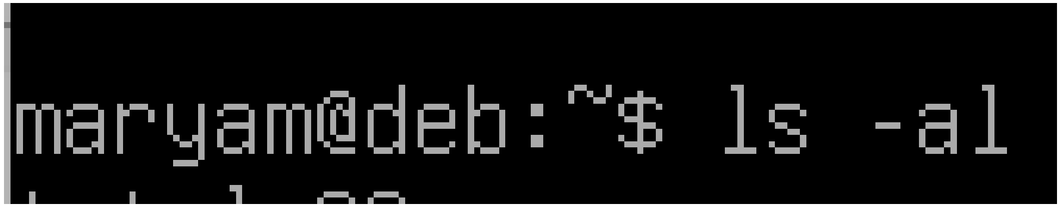
Save the “authorized_keys” File



```
yc2EAAAADAQABAAABAQCwpwVnQPNG0oZNRoChlbu2YalVIpkRldKTWZ7u/7S9S0N
LM5mEwnAyxowgp9QlsE/HuQbjKgN1aPYoZPa8rUC+wqnyuy0sU0qInDuKlJtU5Um
DCPEuppXR6bUiVgxkIlIM++WbP1TWaJh7nL/
hynUpLGKdfWlqvcFxbkJxFpeANrFtsNC1exahqymuQJckGAZapM4AGZ/
aHMNl/S/+tW6bLvpaURJyH4CKyJgqIqkLHJmuB+eYyM/
Zv rsa-key-20240602
```

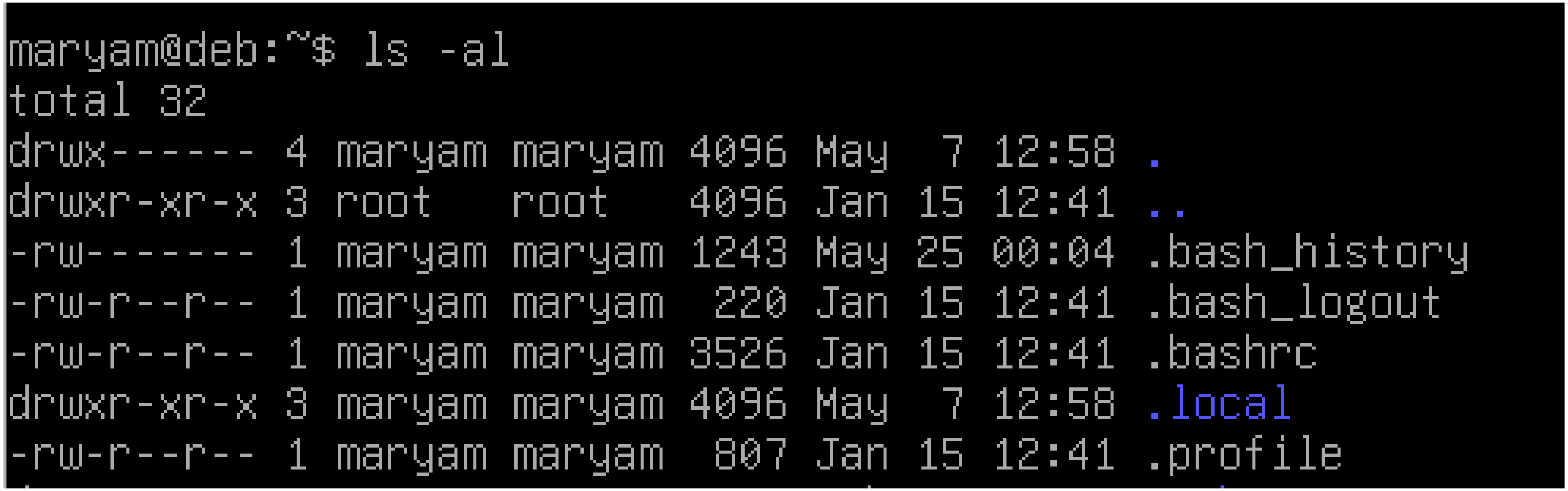
Set up Debian to Use Key Based Authentication

- In Debian write:
  - ls -al



```
maryam@deb:~$ ls -al
```

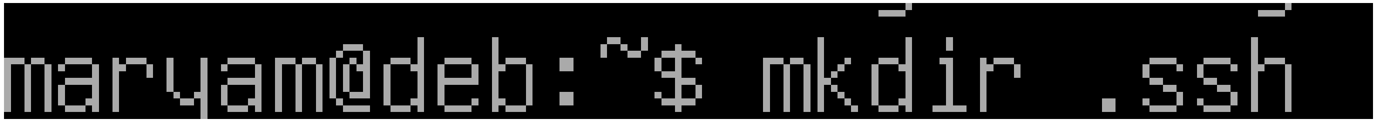
Debian



```
maryam@deb:~$ ls -al
total 32
drwx------ 4 maryam maryam 4096 May  7 12:58 .
drwxr-xr-x 3 root   root   4096 Jan 15 12:41 ..
-rw------- 1 maryam maryam 1243 May 25 00:04 .bash_history
-rw-r--r-- 1 maryam maryam  220 Jan 15 12:41 .bash_logout
-rw-r--r-- 1 maryam maryam 3526 Jan 15 12:41 .bashrc
drwxr-xr-x 3 maryam maryam 4096 May  7 12:58 .local
-rw-r--r-- 1 maryam maryam  807 Jan 15 12:41 .profile
```

In Debian Create a Directory call “.ssh”

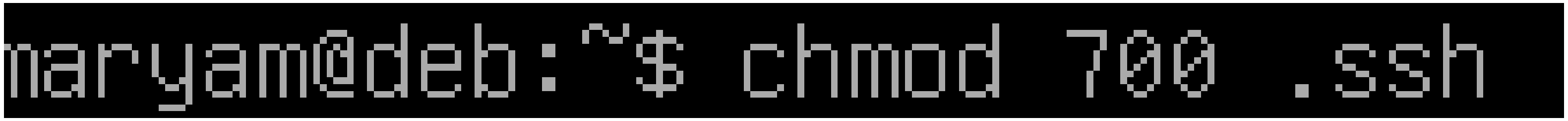
- create a folder called .ssh



```
maryam@deb:~$ mkdir .ssh
```

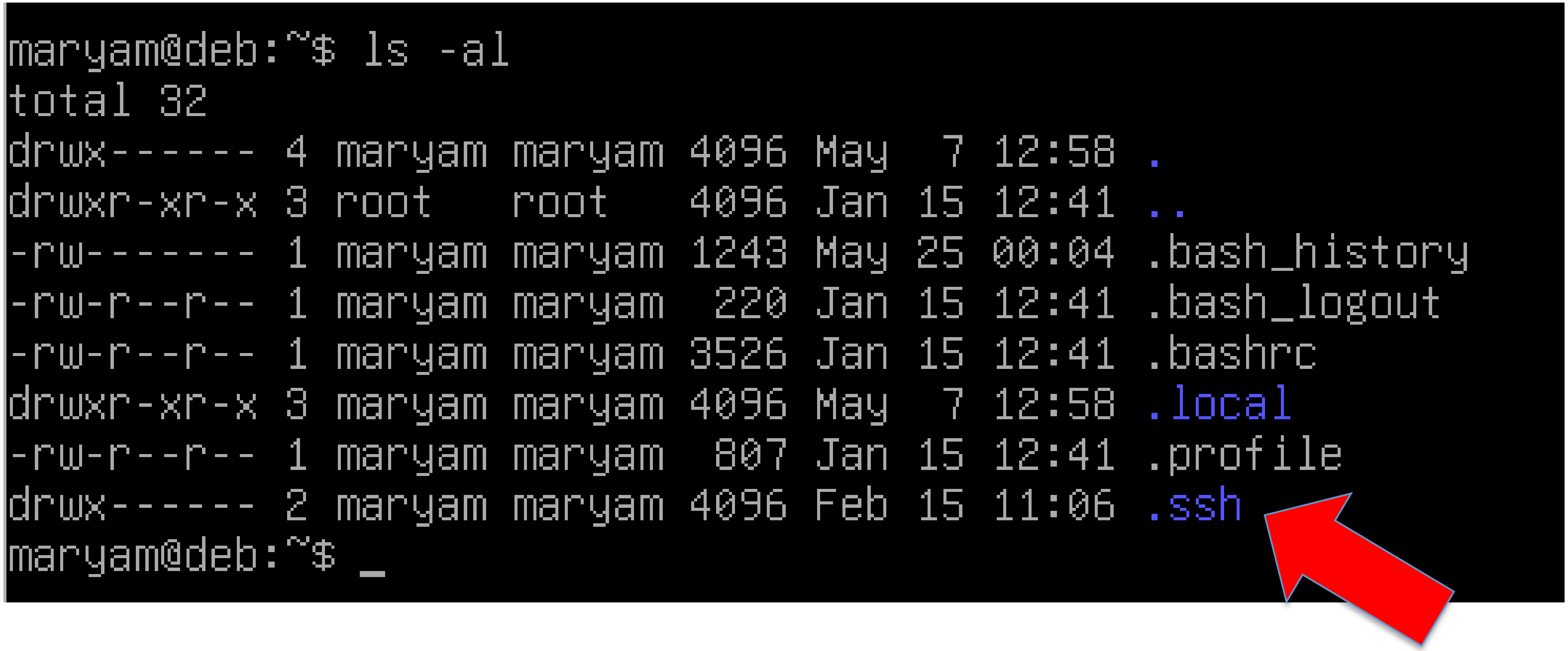
Set the Permission

- Set the proper permissions (read/write/exec for the owner only) to the directory using chmod command



```
maryam@deb:~$ chmod 700 .ssh
```

Deploy Your Public Key to Your Debian Server

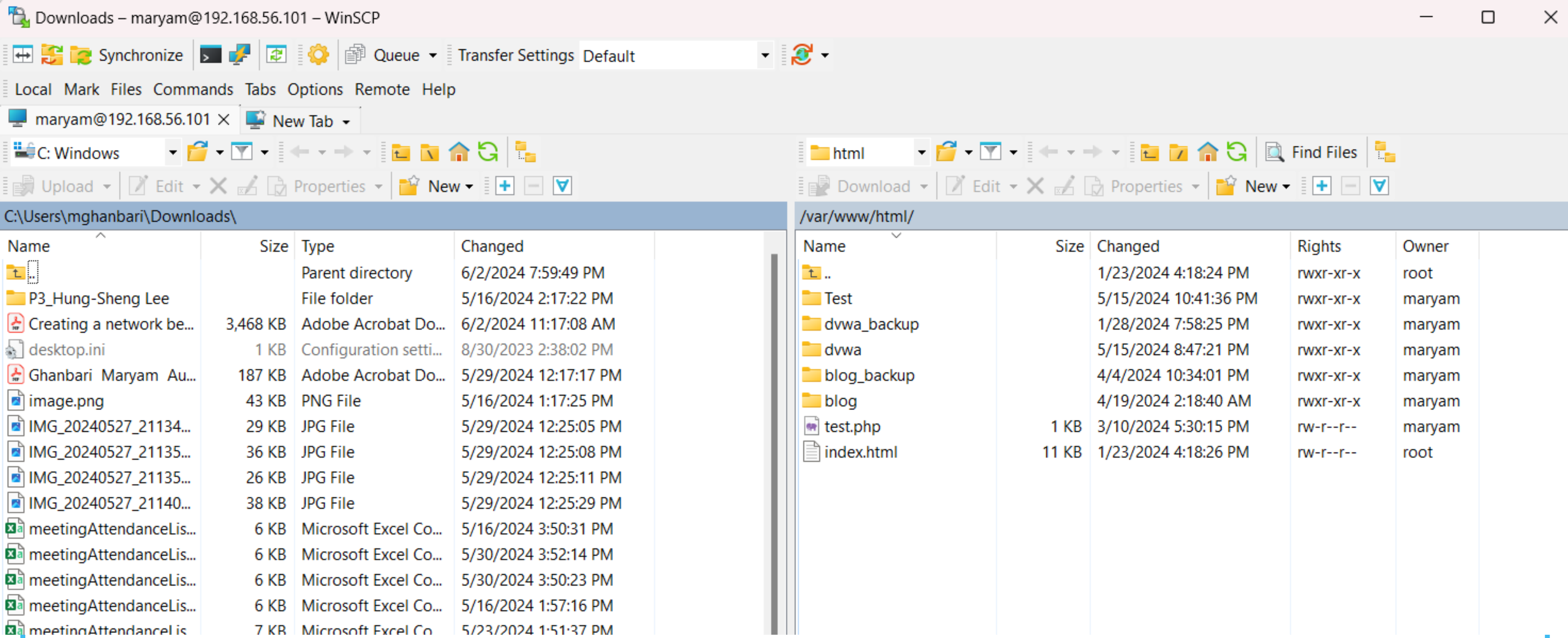


```
maryam@deb:~$ ls -al
total 32
drwx------ 4 maryam maryam 4096 May  7 12:58 .
drwxr-xr-x 3 root   root   4096 Jan 15 12:41 ..
-rw------- 1 maryam maryam 1243 May 25 00:04 .bash_history
-rw-r--r-- 1 maryam maryam  220 Jan 15 12:41 .bash_logout
-rw-r--r-- 1 maryam maryam 3526 Jan 15 12:41 .bashrc
drwxr-xr-x 3 maryam maryam 4096 May  7 12:58 .local
-rw-r--r-- 1 maryam maryam  807 Jan 15 12:41 .profile
drwx------ 2 maryam maryam 4096 Feb 15 11:06 .ssh
maryam@deb:~$ _
```

Open WinSCP

- Upload Your “authorized_keys” File to Your .ssh Folder Using WinSCP

Open WinSCP



Downloads – maryam@192.168.56.101 – WinSCP

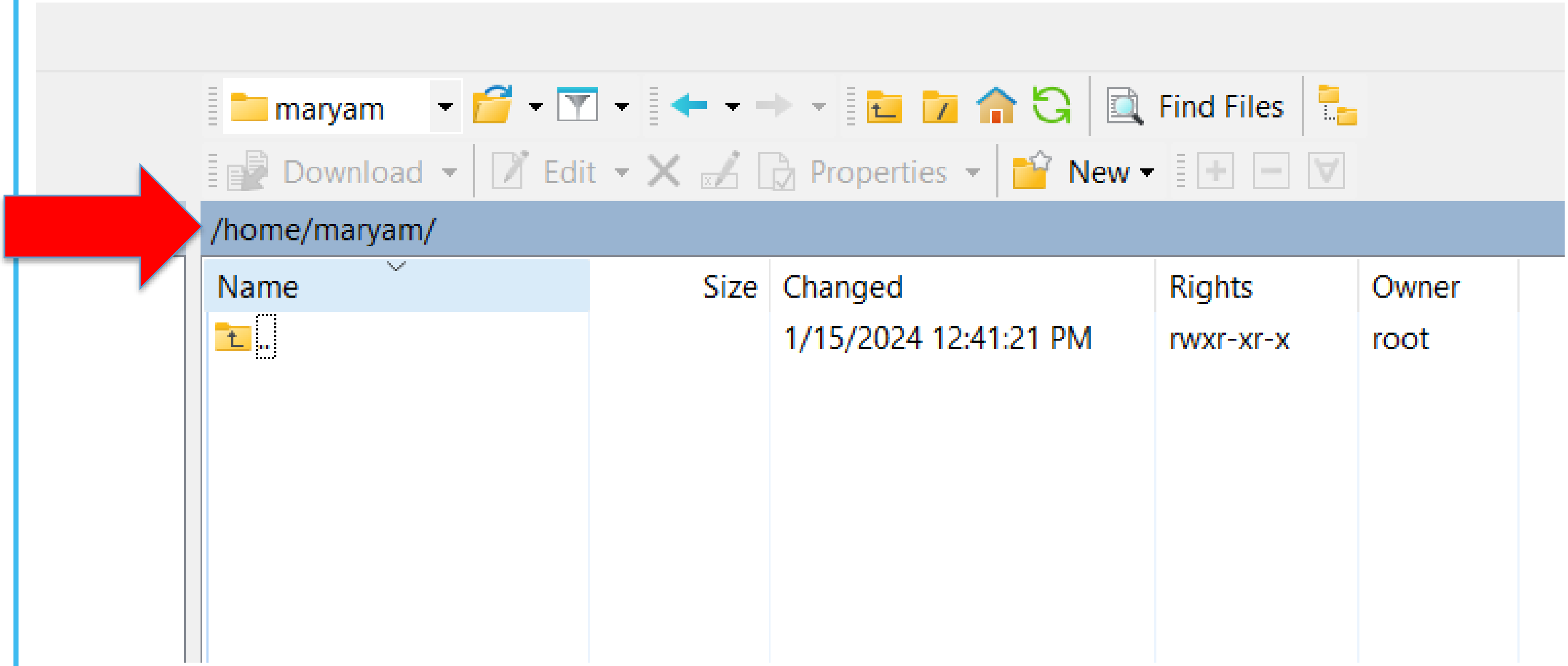
C:\Users\mghanbari\Downloads\

Name	Size	Type	Changed
..		Parent directory	6/2/2024 7:59:49 PM
P3_Hung-Sheng Lee		File folder	5/16/2024 2:17:22 PM
Creating a network be...	3,468 KB	Adobe Acrobat Do...	6/2/2024 11:17:08 AM
desktop.ini	1 KB	Configuration setti...	8/30/2023 2:38:02 PM
Ghanbari_Maryam_Au...	187 KB	Adobe Acrobat Do...	5/29/2024 12:17:17 PM
image.png	43 KB	PNG File	5/16/2024 1:17:25 PM
IMG_20240527_21134...	29 KB	JPG File	5/29/2024 12:25:05 PM
IMG_20240527_21135...	36 KB	JPG File	5/29/2024 12:25:08 PM
IMG_20240527_21135...	26 KB	JPG File	5/29/2024 12:25:11 PM
IMG_20240527_21140...	38 KB	JPG File	5/29/2024 12:25:29 PM
meetingAttendanceLis...	6 KB	Microsoft Excel Co...	5/16/2024 3:50:31 PM
meetingAttendanceLis...	6 KB	Microsoft Excel Co...	5/30/2024 3:52:14 PM
meetingAttendanceLis...	6 KB	Microsoft Excel Co...	5/30/2024 3:50:23 PM
meetingAttendanceLis...	6 KB	Microsoft Excel Co...	5/16/2024 1:57:16 PM
meetingAttendanceLis...	7 KB	Microsoft Excel Co...	5/23/2024 1:51:37 PM

/var/www/html/

Name	Size	Changed	Rights	Owner
..		1/23/2024 4:18:24 PM	rwxr-xr-x	root
Test		5/15/2024 10:41:36 PM	rwxr-xr-x	maryam
dvwa_backup		1/28/2024 7:58:25 PM	rwxr-xr-x	maryam
dvwa		5/15/2024 8:47:21 PM	rwxr-xr-x	maryam
blog_backup		4/4/2024 10:34:01 PM	rwxr-xr-x	maryam
blog		4/19/2024 2:18:40 AM	rwxr-xr-x	maryam
test.php	1 KB	3/10/2024 5:30:15 PM	rw-r--r--	maryam
index.html	11 KB	1/23/2024 4:18:26 PM	rw-r--r--	root

In WinSCP, Go to “home” Directory

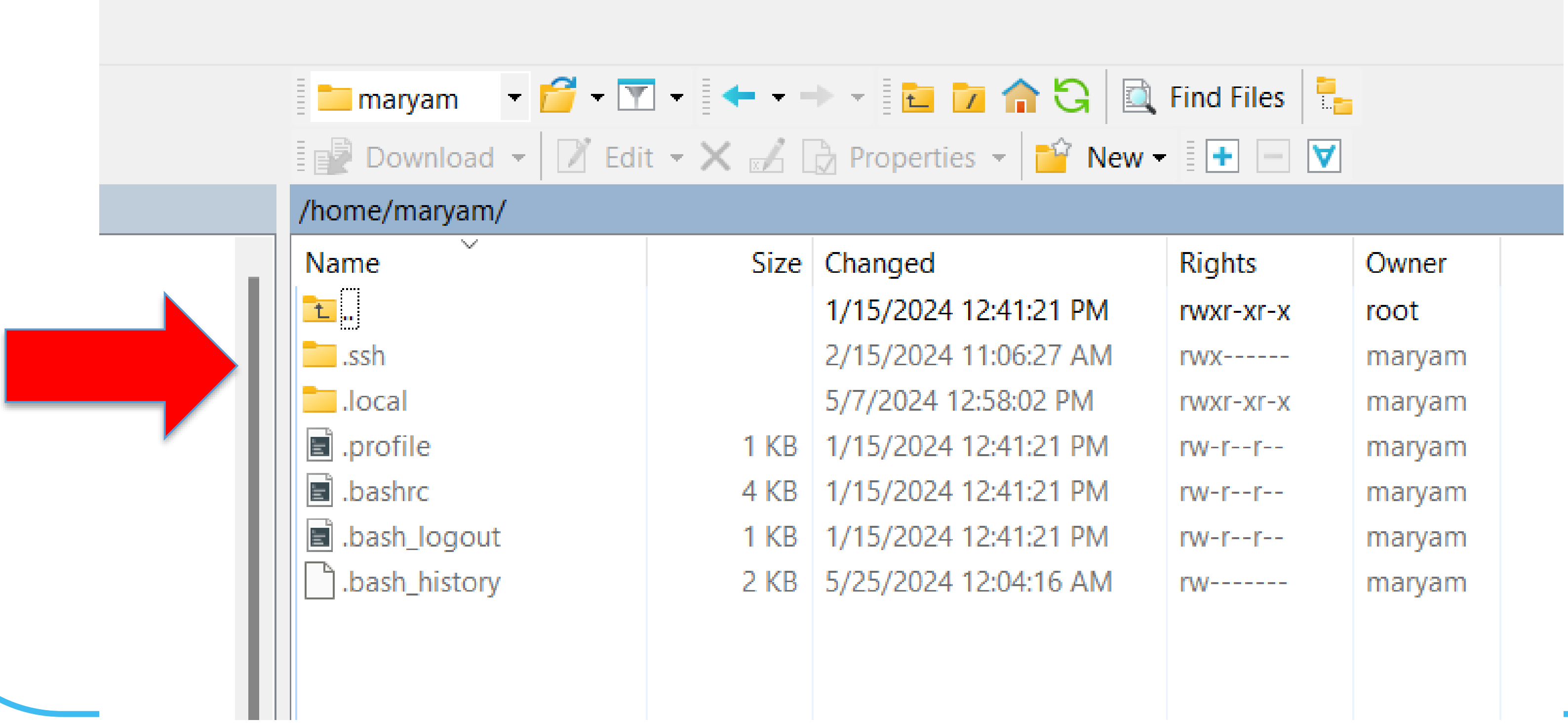


/home/maryam/

Name	Size	Changed	Rights	Owner
..		1/15/2024 12:41:21 PM	rwxr-xr-x	root

In WinSCP, Go to “home” Directory -> Your Username

- Because our directory is called .ssh. It is hidden, so we have to make it visible using
  - Ctrl + Alt +H

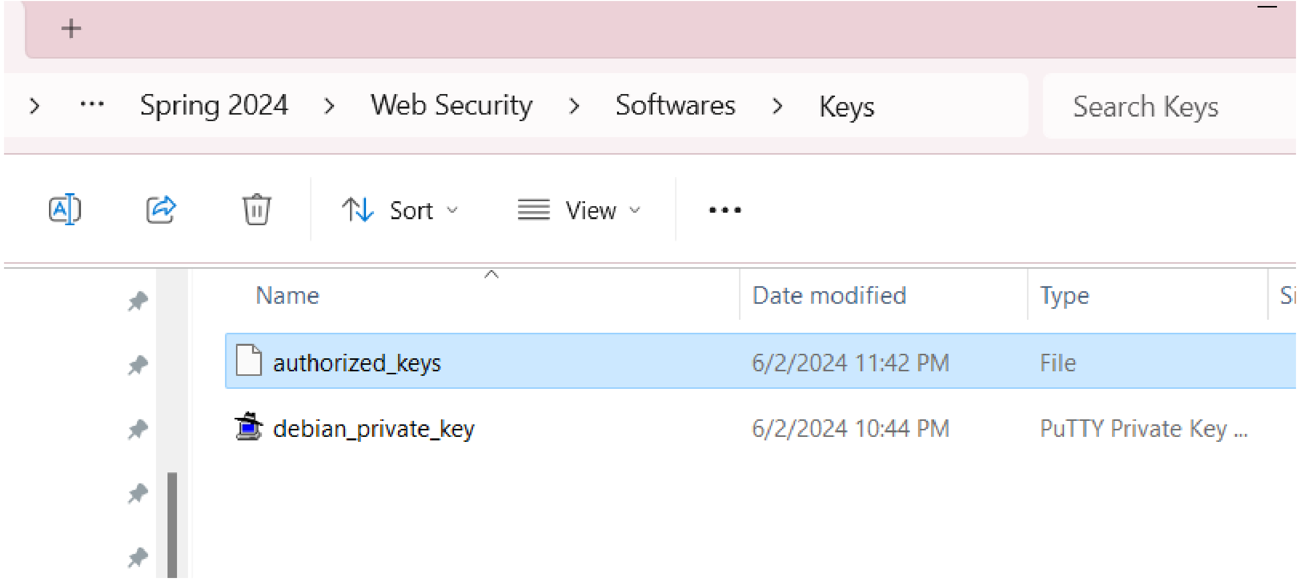


/home/maryam/

Name	Size	Changed	Rights	Owner
..		1/15/2024 12:41:21 PM	rwxr-xr-x	root
.ssh		2/15/2024 11:06:27 AM	rwx------	maryam
.local		5/7/2024 12:58:02 PM	rwxr-xr-x	maryam
.profile	1 KB	1/15/2024 12:41:21 PM	rw-r--r--	maryam
.bashrc	4 KB	1/15/2024 12:41:21 PM	rw-r--r--	maryam
.bash_logout	1 KB	1/15/2024 12:41:21 PM	rw-r--r--	maryam
.bash_history	2 KB	5/25/2024 12:04:16 AM	rw-------	maryam

In WinSCP, Go to “home” Directory -> Your Username -> .SSH

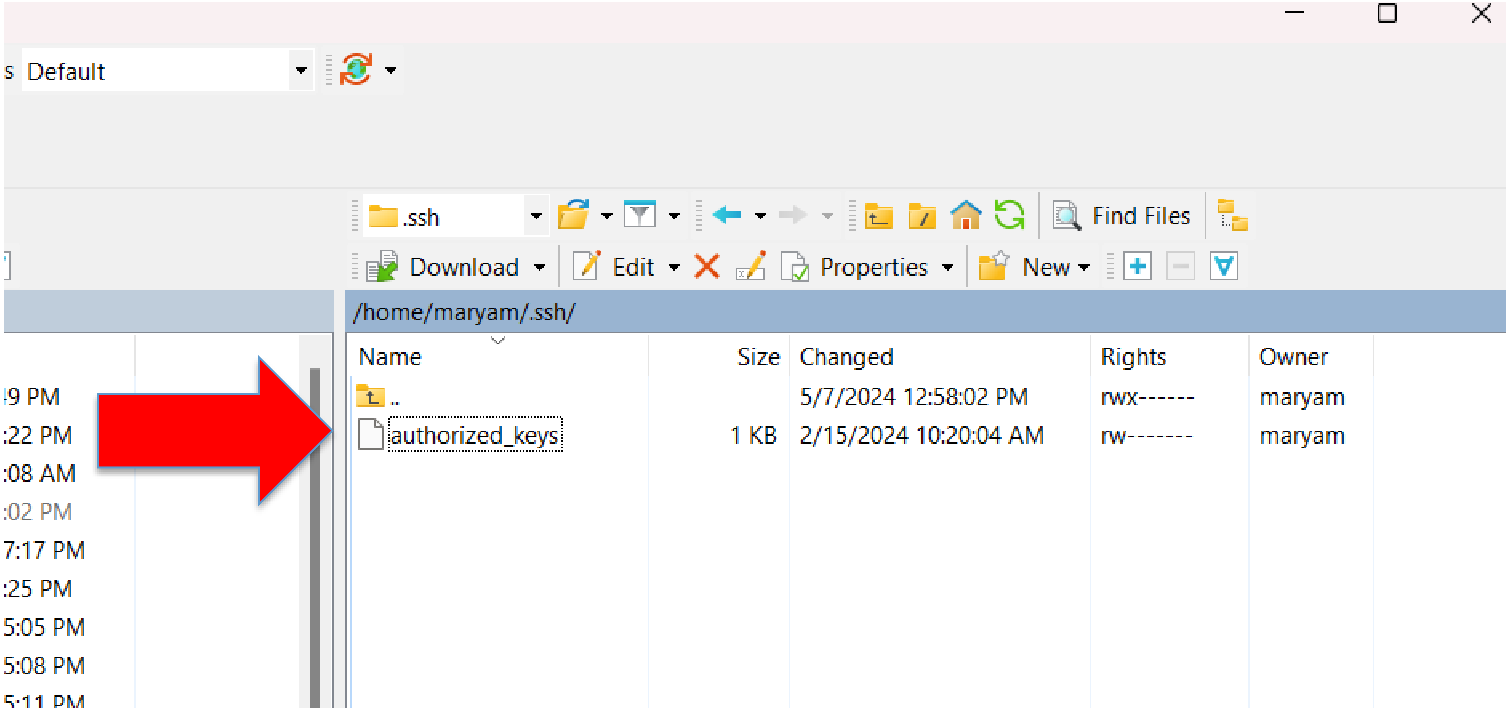
- Copy the “authorized_keys” File



Name	Date modified	Type	Si
authorized_keys	6/2/2024 11:42 PM	File	
debian_private_key	6/2/2024 10:44 PM	PuTTY Private Key ...	

In WinSCP, Go to “home” Directory -> Your Username -> .SSH

- Paste the “authorized_keys” File in the .SSH in



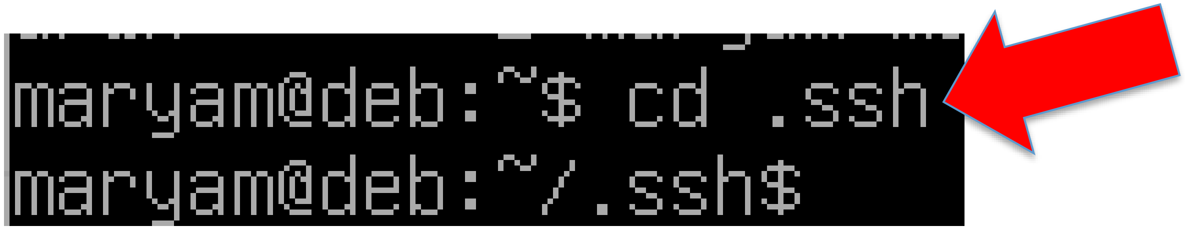
/home/maryam/.ssh/

Name	Size	Changed	Rights	Owner
..		5/7/2024 12:58:02 PM	rwx------	maryam
authorized_keys	1 KB	2/15/2024 10:20:04 AM	rw-------	maryam

RRC POLYTECH

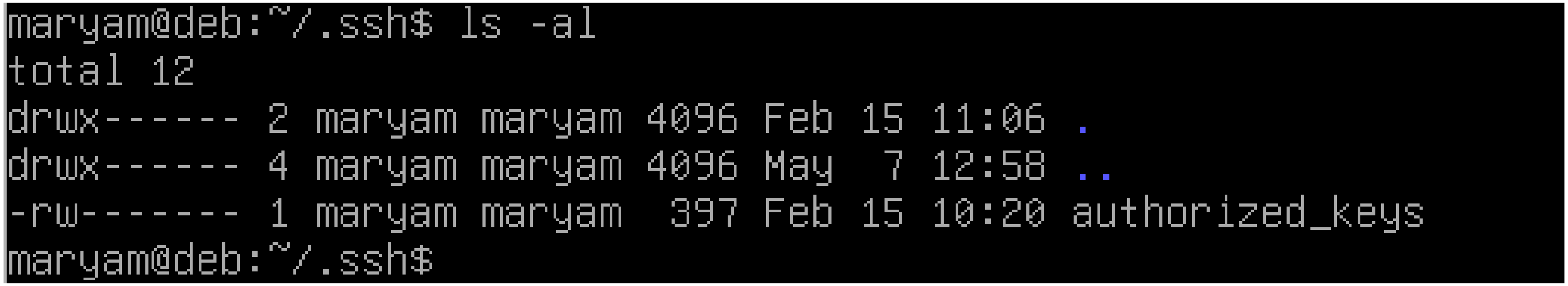
In Debian Change into “.ssh” Directory

- Set the permission again



```
maryam@deb:~$ cd .ssh
maryam@deb:~/.ssh$
```

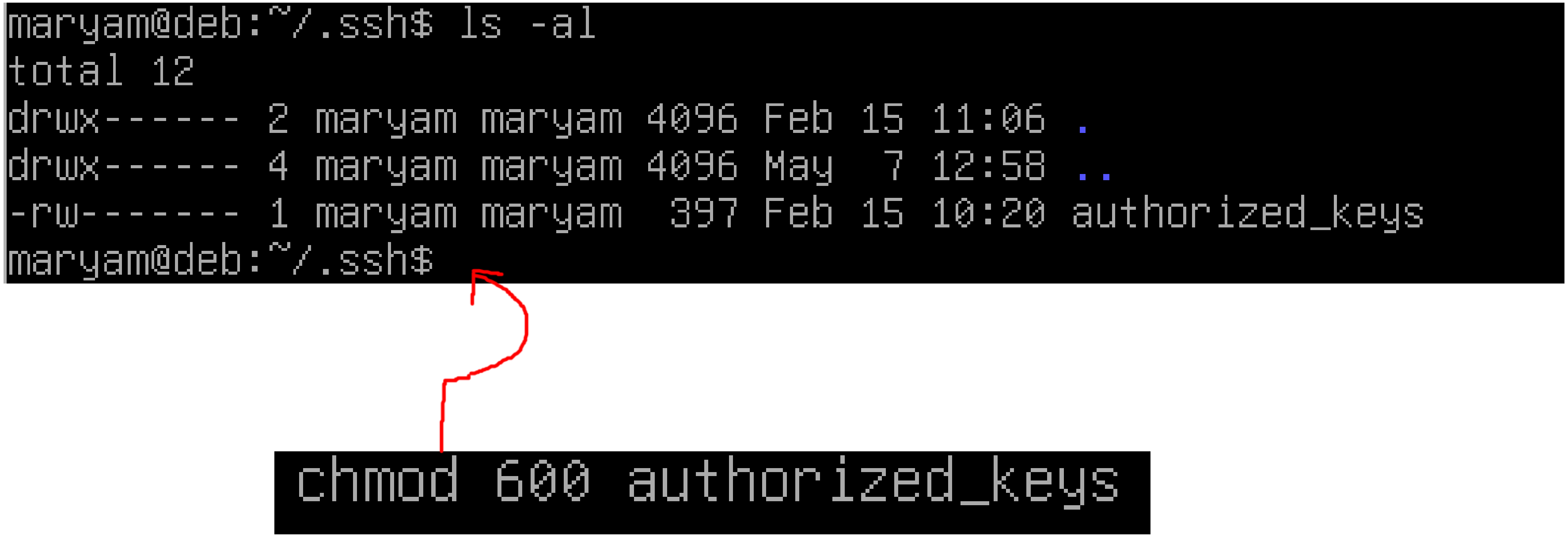
Set the Permission Again To Ensure Extra Security for Our Keys



```
maryam@deb:~/.ssh$ ls -al
total 12
drwx------ 2 maryam maryam 4096 Feb 15 11:06 .
drwx------ 4 maryam maryam 4096 May  7 12:58 ..
-rw------- 1 maryam maryam  397 Feb 15 10:20 authorized_keys
maryam@deb:~/.ssh$
```

Set the Permission Again To Ensure extra security for our Keys

- Secure the file containing your public keys (read/write)

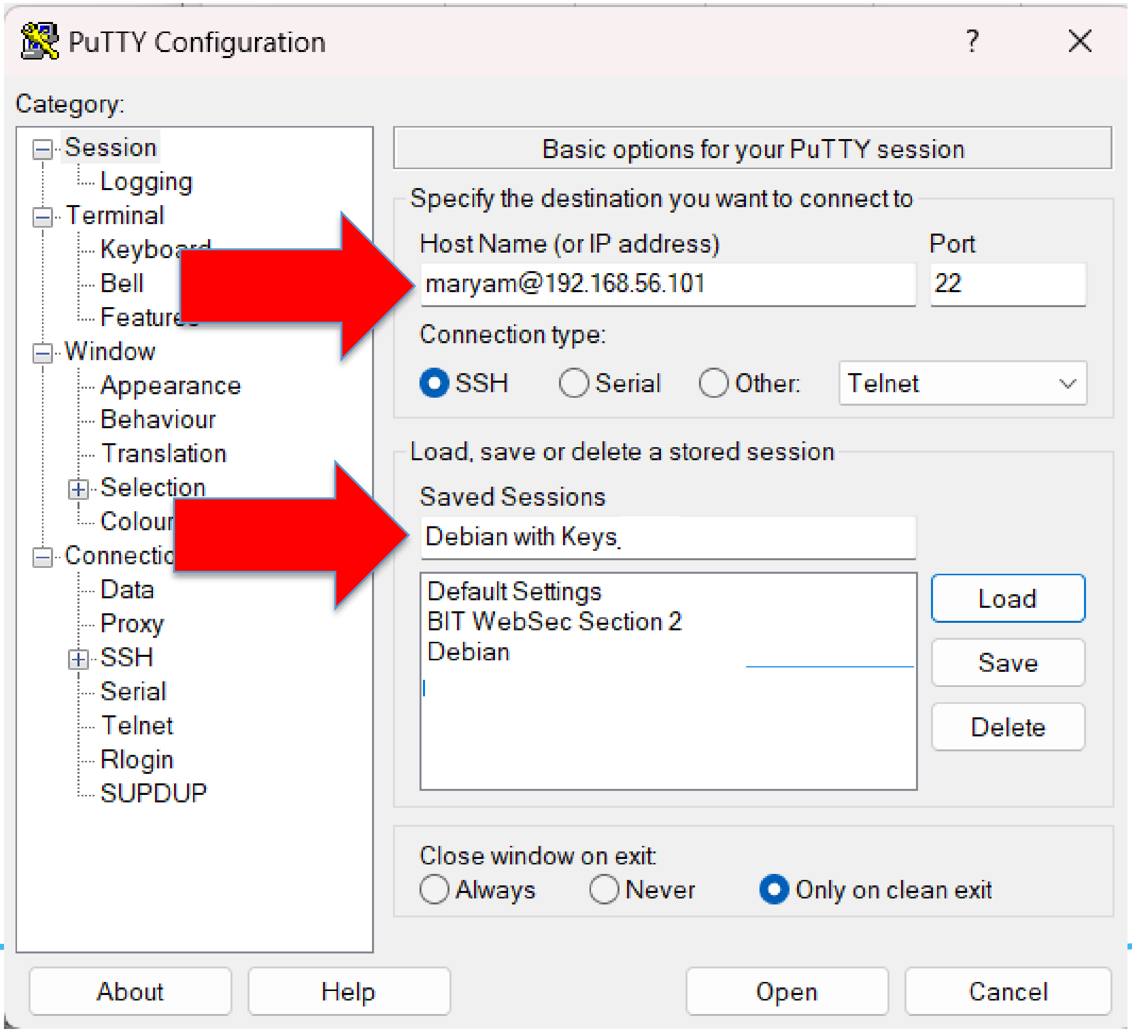


```
maryam@deb:~/.ssh$ ls -al
total 12
drwx------ 2 maryam maryam 4096 Feb 15 11:06 .
drwx------ 4 maryam maryam 4096 May  7 12:58 ..
-rw------- 1 maryam maryam  397 Feb 15 10:20 authorized_keys
maryam@deb:~/.ssh$
```

```
chmod 600 authorized_keys
```

Test the Configuration

- Open Putty and enter information



PuTTY Configuration

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): maryam@192.168.56.101

Port: 22

Connection type: ● SSH ○ Serial ○ Other: Telnet

Load, save or delete a stored session

Saved Sessions: Debian with Keys

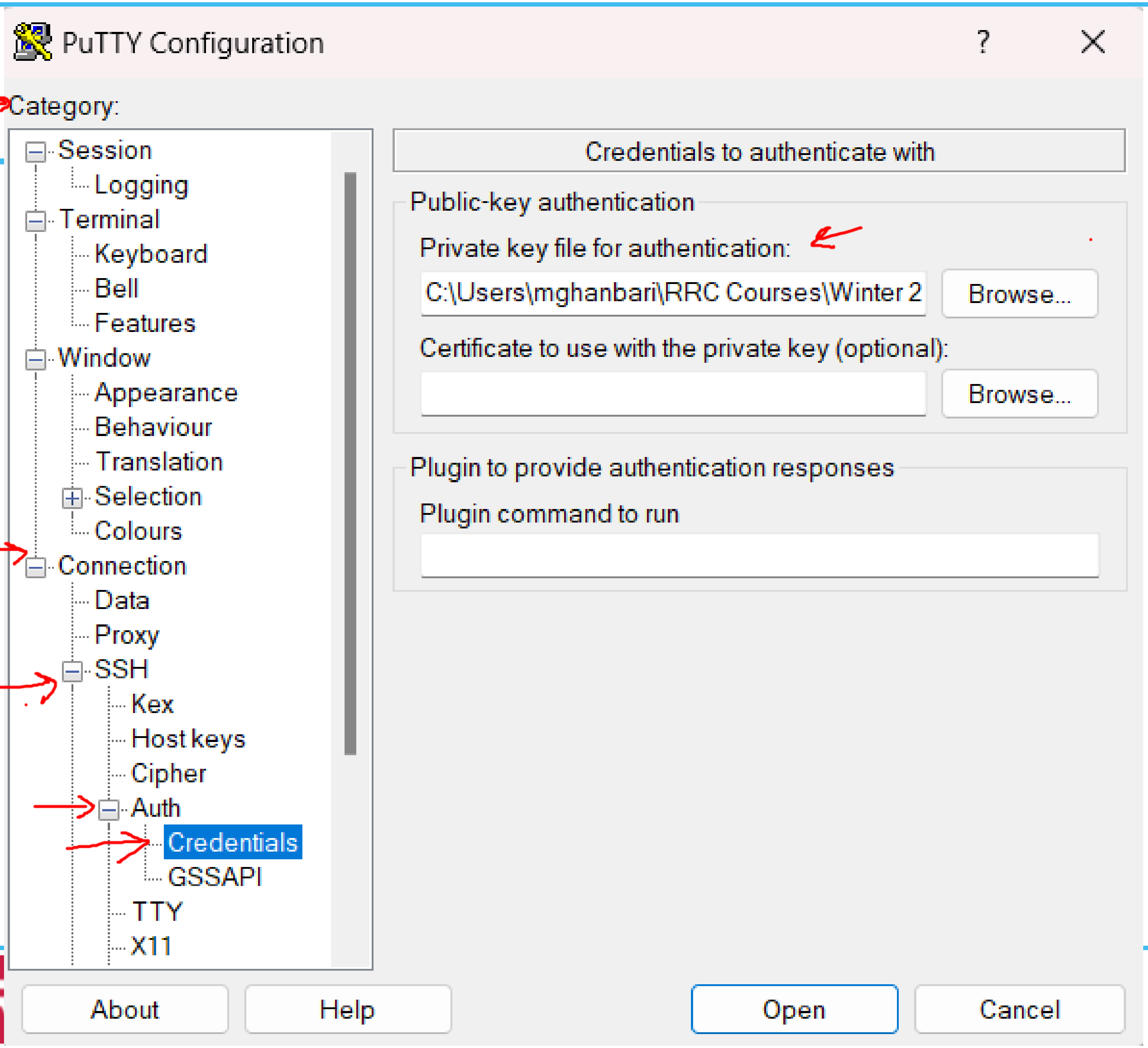
Default Settings
BIT WebSec Section 2
Debian

Close window on exit: ○ Always ○ Never ● Only on clean exit

RRC POLYTECH

Tell PuTTY to Use Private Key

- Category -> Connection -> SSH -> Auth -> Credentials -> Private key file for authentication



PuTTY Configuration

Category:

Credentials to authenticate with

Public-key authentication

Private key file for authentication:

C:\Users\mghanbari\RRC Courses\Winter 2

Browse...

Certificate to use with the private key (optional):

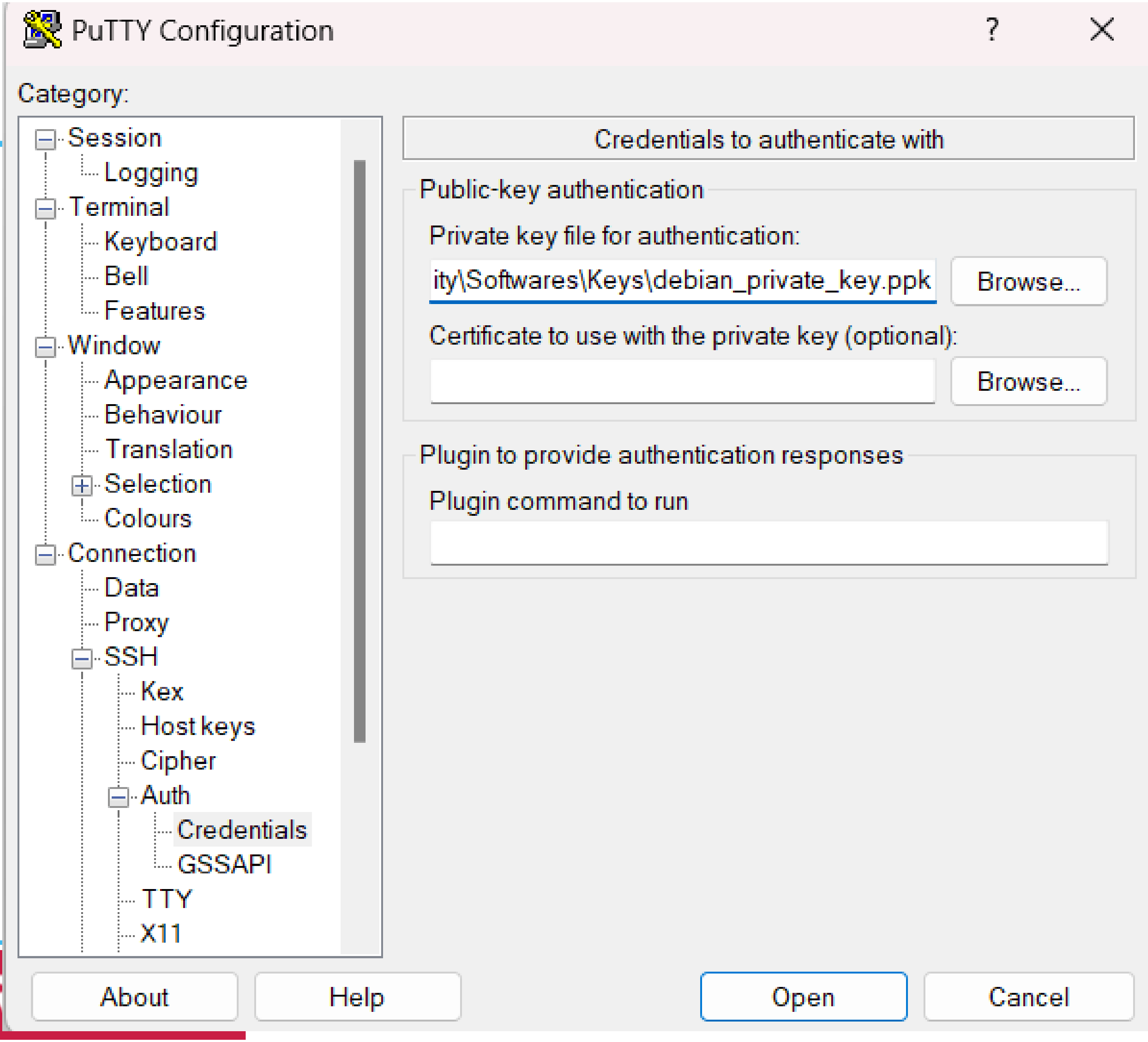
Browse...

Plugin to provide authentication responses

Plugin command to run

Browse

- Browse for the created private key from the Software -> keys folder



PuTTY Configuration

Credentials to authenticate with

Public-key authentication

Private key file for authentication: ity\Softwares\Keys\debian_private_key.ppk

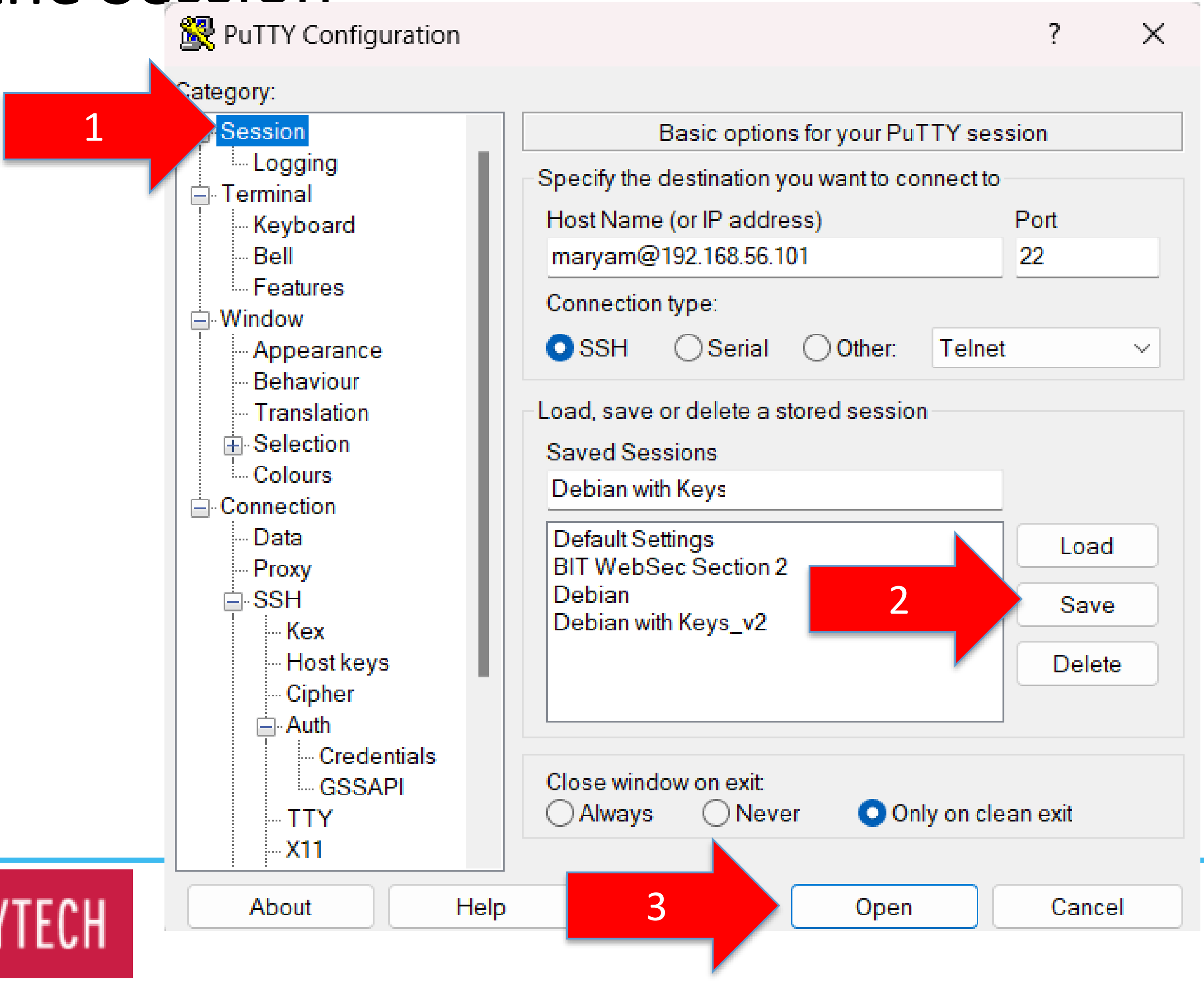
Certificate to use with the private key (optional):

Plugin to provide authentication responses

Plugin command to run

Save the Session

- ➢ Select the Session



PuTTY Configuration

Category:

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): maryam@192.168.56.101

Port: 22

Connection type:

● SSH ○ Serial ○ Other: Telnet

Load, save or delete a stored session

Saved Sessions: Debian with Keys

Default Settings
BIT WebSec Section 2
Debian
Debian with Keys_v2

Close window on exit:

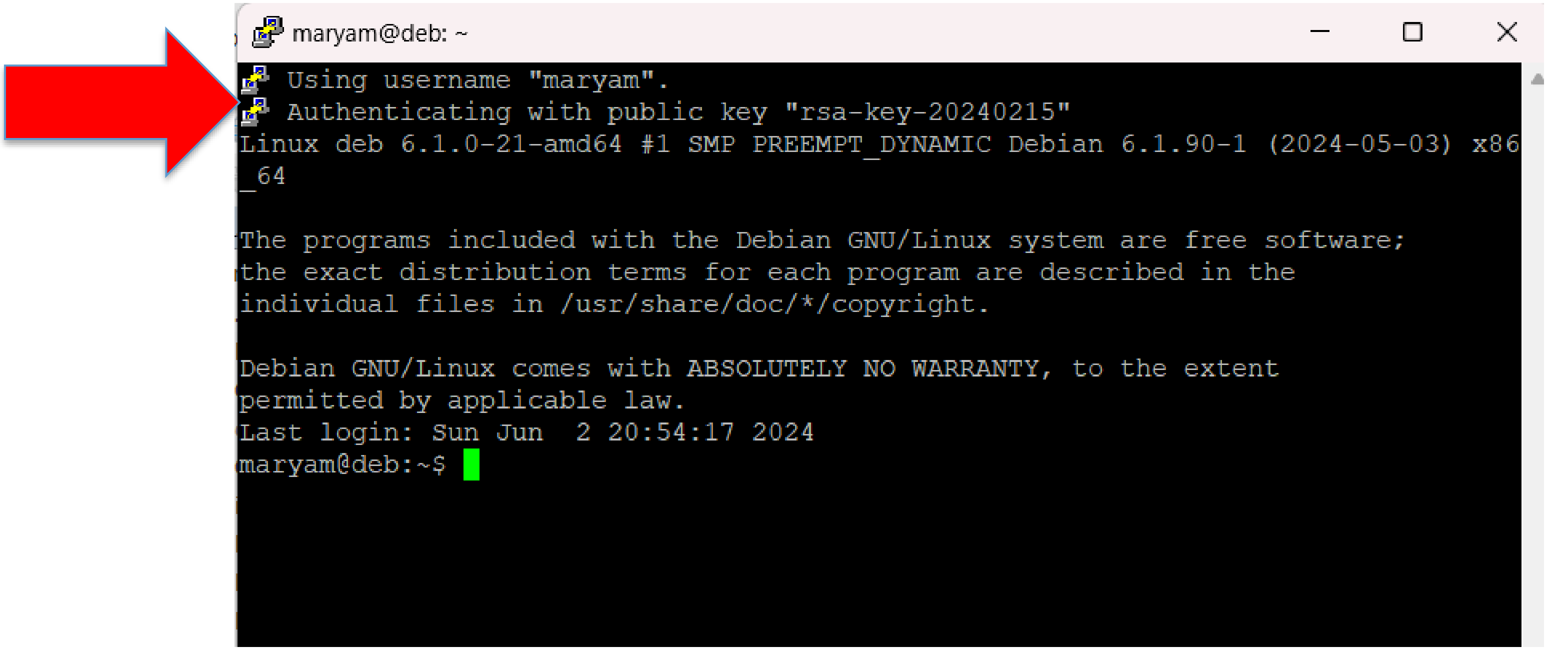
○ Always ○ Never ● Only on clean exit

- ➢ Save
- ➢ Open

RRC POLYTECH

Open the Session to Test it

- Enter Passphrase



```
Using username "maryam".
Authenticating with public key "rsa-key-20240215"
Linux deb 6.1.0-21-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.1.90-1 (2024-05-03) x86
_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sun Jun  2 20:54:17 2024
maryam@deb:~$ 
```

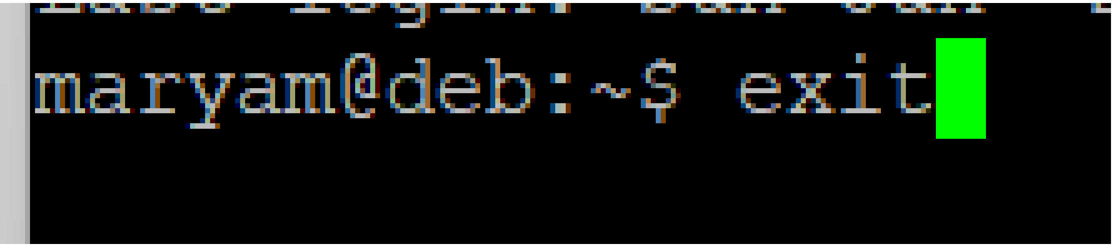
RRC POLYTECH

Open the Session

- We can see that we have successfully made a key based connection

Exit the PuTTY

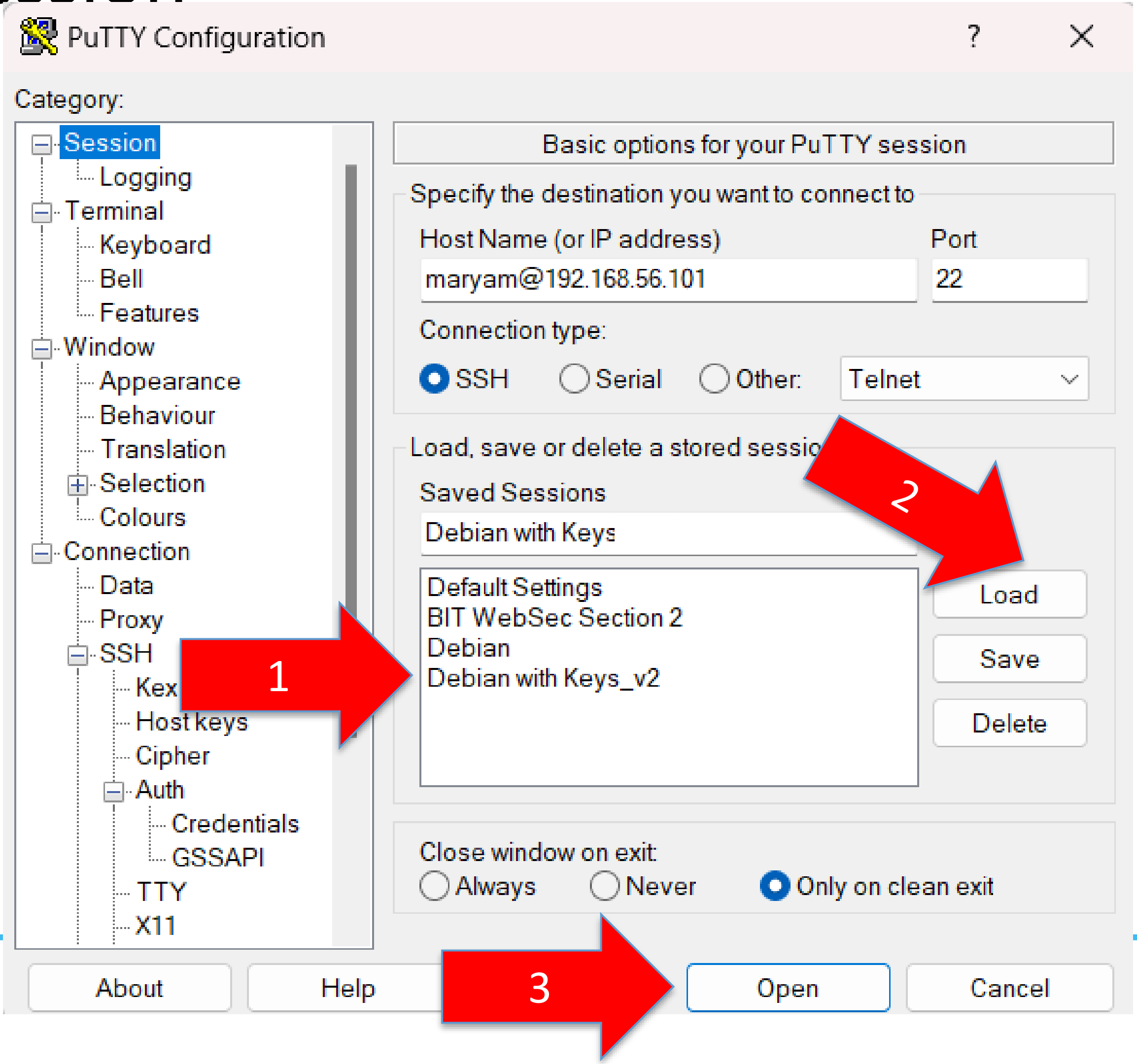
- Exit the PuTTY and



```
maryam@deb:~$ exit
```

Open the Session Again

- Select the Session



PuTTY Configuration

Category:

Session
- Logging
- Terminal
  - Keyboard
  - Bell
  - Features
- Window
  - Appearance
  - Behaviour
  - Translation
  - Selection
  - Colours
- Connection
  - Data
  - Proxy
  - SSH
    - Kex
    - Host keys
    - Cipher
    - Auth
      - Credentials
      - GSSAPI
    - TTY
    - X11

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): maryam@192.168.56.101

Port: 22

Connection type: ● SSH ○ Serial ○ Other: Telnet

Load, save or delete a stored session

Saved Sessions: Debian with Keys

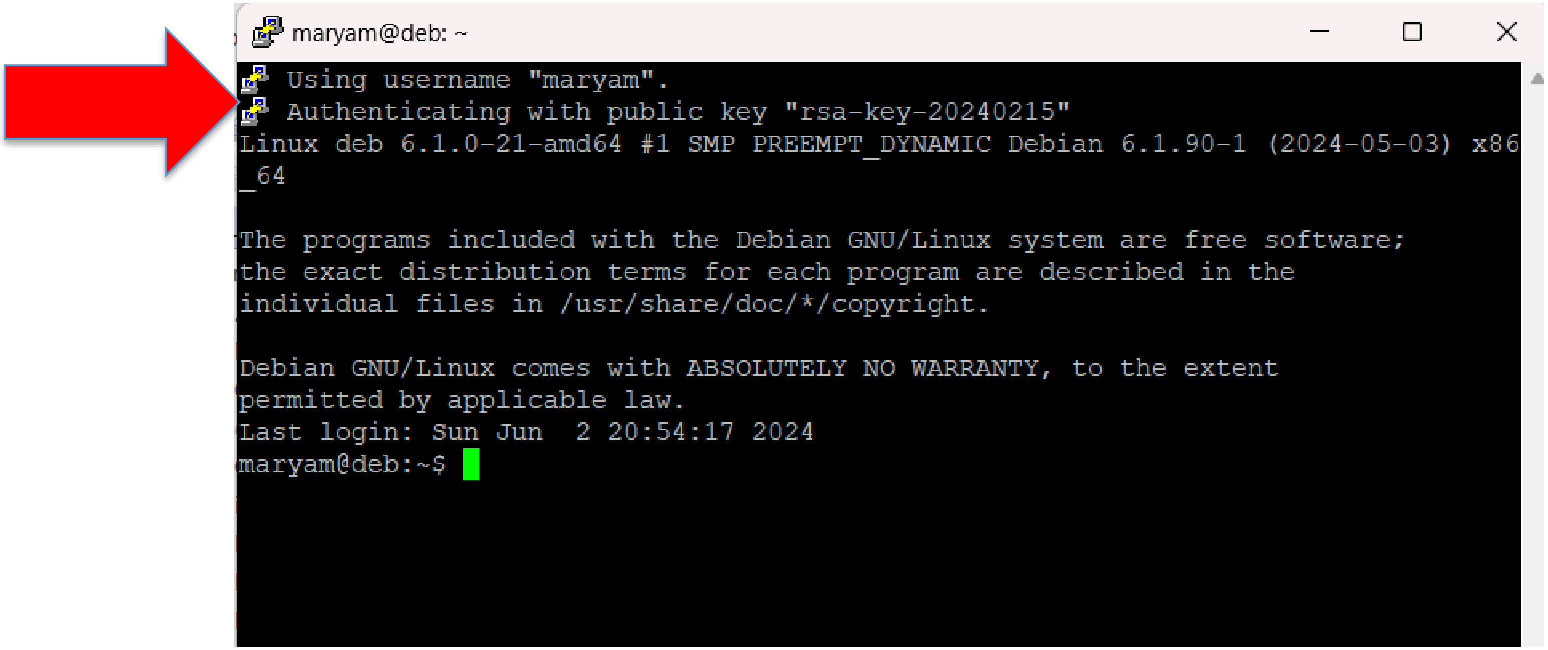
Default Settings
BIT WebSec Section 2
Debian
Debian with Keys_v2

Close window on exit: ○ Always ○ Never ● Only on clean exit

RRC POLYTECH

Open the Session to Test it

- Enter Passphrase



```
  Using username "maryam".
  Authenticating with public key "rsa-key-20240215"
Linux deb 6.1.0-21-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.1.90-1 (2024-05-03) x86
_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sun Jun  2 20:54:17 2024
maryam@deb:~$
```

End

- Exit PuTTY
- Close WinSCP
- Close PUTTYGen
- Shout down Debian
- Quit VMWare