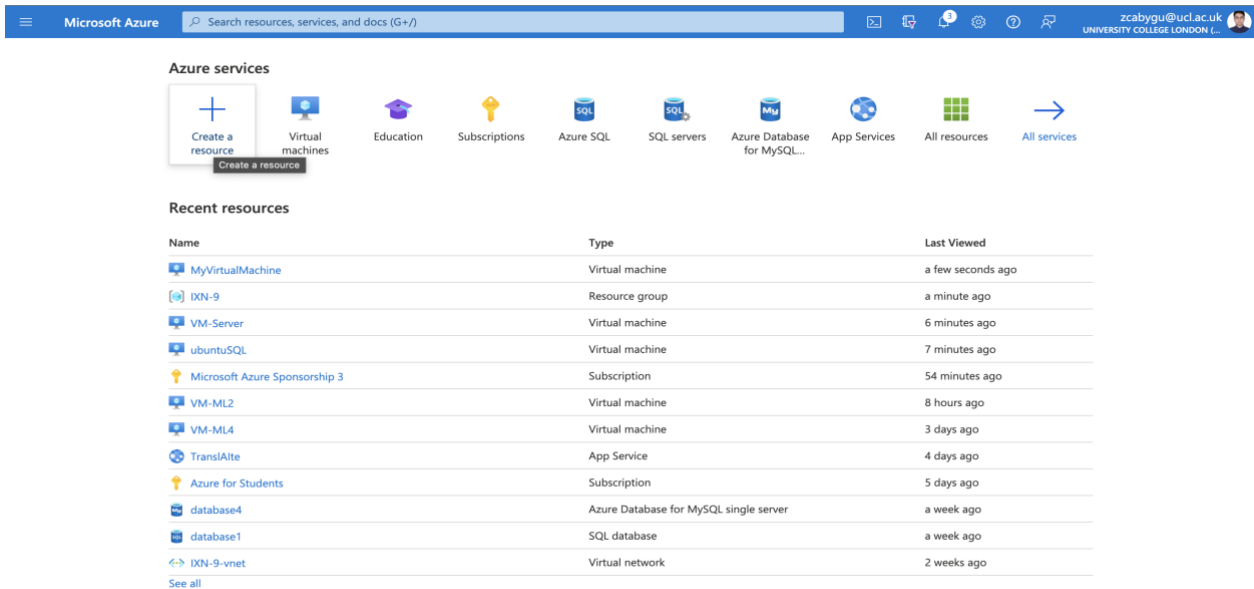


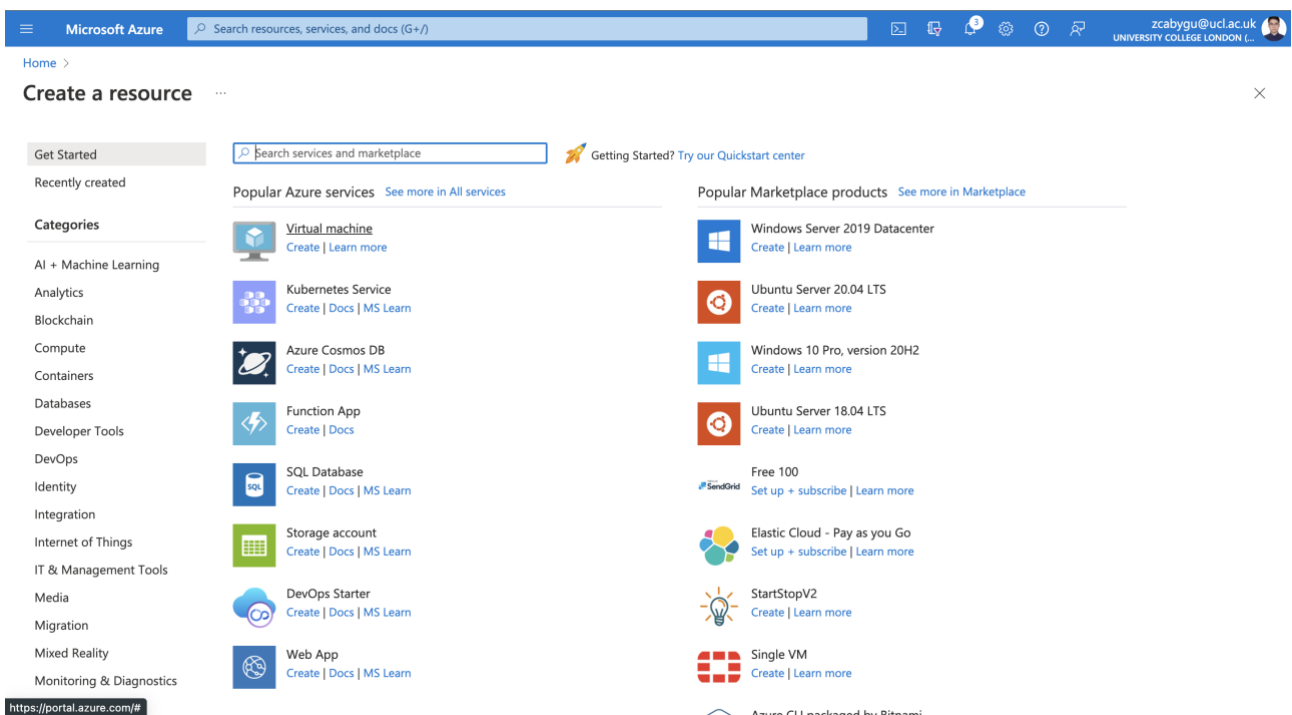
# Deployment Guide of the Transl'AI'te Web Application

## Step 1. Create an Azure Virtual Machine



<https://portal.azure.com/#create/hub?subscriptionId=640a5079-21c8-4dc9-9db1-a3b71c76afcd>

### 1. Login to your Microsoft Azure Portal.



<https://portal.azure.com/#>

### 2. Click the 'Create a resource' option under **Azure services**.

3. Type **virtual machines** in the search. Under Services, select Virtual machines.

4. In the Virtual machines page, select Create and then Virtual machine.

The screenshot shows the 'Create a virtual machine' page in the Microsoft Azure portal. The 'Basics' tab is active. Under 'Project details', the 'Subscription' is set to 'Microsoft Azure Sponsorship 3' and the 'Resource group' is 'DXN-9'. Under 'Instance details', the 'Virtual machine name' is 'MyVirtualMachine', the 'Region' is '(Europe) UK South', 'Availability options' is 'No infrastructure redundancy required', 'Security type' is 'Standard', and the 'Image' is 'Ubuntu Server 20.04 LTS - Gen2'. The 'Azure Spot instance' checkbox is unchecked. At the bottom, there is a 'Review + create' button and navigation buttons for '< Previous' and 'Next : Disks >'.

The Create a virtual machine page opens.

5. In the **Basics** tab, under **Project details**, make sure the correct subscription is selected and then choose to **Create new** resource group.

Type *myResourceGroup* for the name.\*.

6. Under **Instance details**, type *myVM* for the **Virtual machine name**, and choose *Ubuntu 18.04 LTS - Gen2* for your **Image**. Leave the other defaults. The default size and pricing is only shown as an example. Size availability and pricing are dependent on your region and subscription.

7. Under **Administrator account**, select **Password**.

8. Enter your desired **Username** and **Password** for the virtual machines. If portal rejects your username and password, retry according to its rules until it is accepted. Remember the username and the password you entered.

9. Under Inbound port rules > Public inbound ports, choose Allow selected ports and then select SSH (22), HTTP (80), and HTTPS (443) from the drop-down.

10. Leave the remaining defaults and then select the **Review + create** button at the bottom of the page.

11. On the **Create a virtual machine** page, you can see the details about the

VM you are about to create. When you are ready, select **Create**.

12. Wait for the deployment of your virtual machine.

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Home > CreateVm-canonical.0001-com-ubuntu-server-focal-2-20220329212135 | Overview

Deployment

Search (Cmd+/) Delete Cancel Redeploy Refresh

We'd love your feedback! →

### Deployment is in progress

Deployment name: CreateVm-canonical.0001-com-ubuntu-server-f... Start time: 3/29/2022, 9:25:19 PM  
 Subscription: Microsoft Azure Sponsorship 3 Correlation ID: 756cad22-2cf9-4cca-b2ca-e4766b75fed3  
 Resource group: IXN-9

Deployment details (Download)

Resource	Type	Status	Operation details
MyVirtualMachine	Microsoft.Compute/virtualMa...	Created	<a href="#">Operation details</a>
myvirtualmachine19	Microsoft.Network/networkIn...	Created	<a href="#">Operation details</a>
MyVirtualMachine-ip	Microsoft.Network/publicIpA...	OK	<a href="#">Operation details</a>
MyVirtualMachine-nsg	Microsoft.Network/networkSe...	OK	<a href="#">Operation details</a>

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Deployment

Search (Cmd+/) Delete Cancel Redeploy Refresh

We'd love your feedback! →

### Your deployment is complete

Deployment name: CreateVm-canonical.0001-com-ubuntu-server-f... Start time: 3/29/2022, 9:25:19 PM  
 Subscription: Microsoft Azure Sponsorship 3 Correlation ID: 756cad22-2cf9-4cca-b2ca-e4766b75fed3  
 Resource group: IXN-9

Deployment details (Download)

Next steps

- [Setup auto-shutdown](#) Recommended
- [Monitor VM health, performance and network dependencies](#) Recommended
- [Run a script inside the virtual machine](#) Recommended

[Go to resource](#) [Create another VM](#)

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[Set up cost alerts >](#)

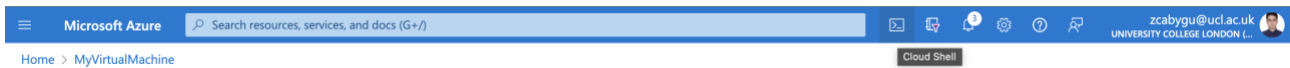
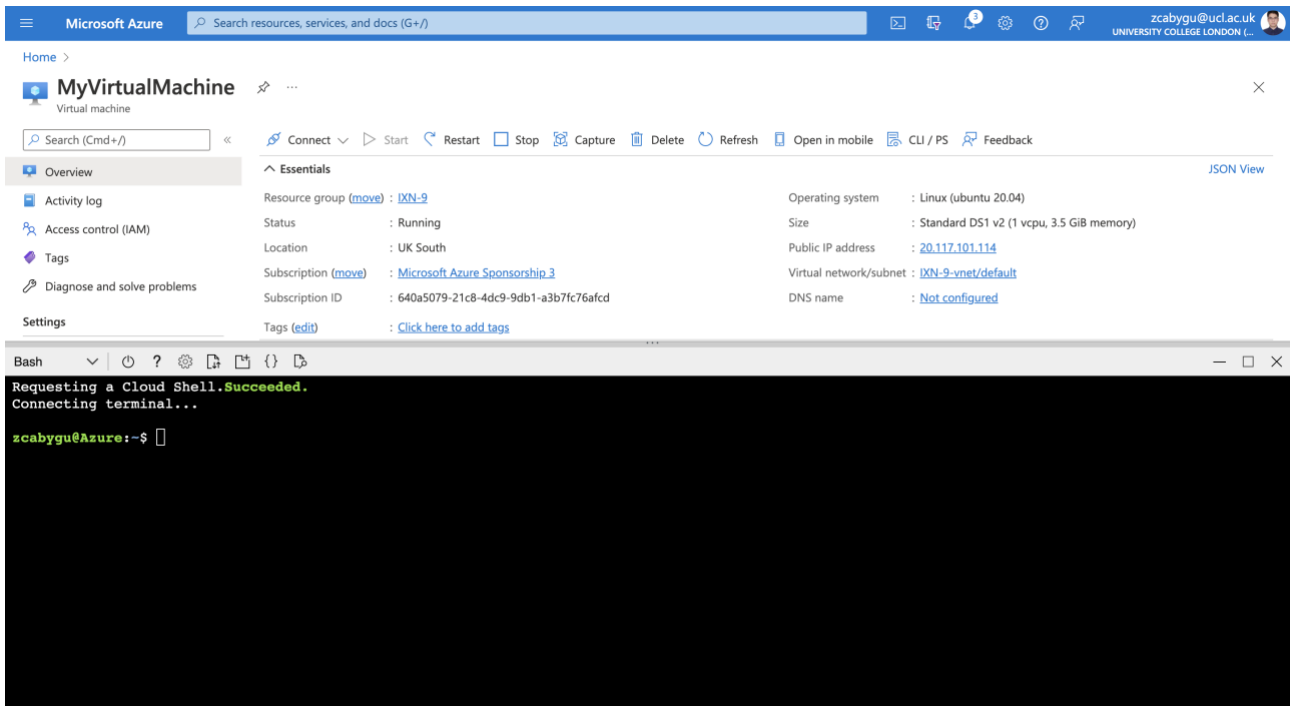
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13. When the deployment is finished, select **Go to resource**.

## Step 2. Connect to your virtual machine



1. Open the Cloud Shell in the top-right corner in your Azure Portal.
2. Connect to your virtual machine via SSH with client.

Type the following command in the Cloud Shell:

**'ssh <username>@<Public IP address>'**

Replace the <username> with the username you entered when you create the virtual machine.

Replace the <Public IP address> with the Public IP address of your azure virtual machine. You can find it in the position as the picture shows below: The

Public IP address of this sample virtual machine is 20.117.101.114, the third

The screenshot shows the Microsoft Azure portal interface. At the top, there's a search bar and navigation icons. The main header displays 'MyVirtualMachine' and 'Virtual machine'. Below this, there's a search bar for commands and a row of action buttons: Connect, Start, Restart, Stop, Capture, Delete, Refresh, Open in mobile, CLI / PS, and Feedback. The 'Overview' tab is selected, showing a sidebar with 'Activity log', 'Access control (IAM)', 'Tags', and 'Diagnose and solve problems'. The main content area is divided into 'Essentials' and 'JSON View'. The 'Essentials' section lists various attributes: Resource group (IXN-9), Status (Running), Location (UK South), Subscription (Microsoft Azure Sponsorship 3), Subscription ID (640a5079-21c8-4dc9-9db1-a3b7fc76afcd), Tags (Click here to add tags), Operating system (Linux (ubuntu 20.04)), Size (Standard DS1 v2 (1 vcpu, 3.5 GiB memory)), Public IP address (20.117.101.114), Virtual network/subnet (IXN-9-vnet/default), and DNS name (Not configured).

row of the second column. Did you find it?

3. After you typed the correct ssh command, it will ask you for the password of your virtual machine. (If you are first connecting to the virtual machine, it will ask you if you really want to connect to it with a (yes/no) option. Type yes to continue)

After you entered the correct password, you can connect to your virtual machine. The head of your command will change to <username>@<name of your virtual machine> as shown below. This is a proof of you successfully

```
zcabygu@Azure:~$ ssh User_1@20.117.101.114
User_1@20.117.101.114's password:
```

```
Bash
zcabygu@Azure:~$ ssh User_1@20.117.101.114
User_1@20.117.101.114's password:
Welcome to Ubuntu 20.04.4 LTS (GNU/Linux 5.13.0-1017-azure x86_64)

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

System information as of Tue Mar 29 20:52:06 UTC 2022

System load:  0.0          Processes:    109
Usage of /:   4.8% of 28.9GB Users logged in:  0
Memory usage: 7%          IPv4 address for eth0: 10.1.0.5
Swap usage:   0%

 * Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

  https://ubuntu.com/blog/microk8s-memory-oi Terminal container button

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

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

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

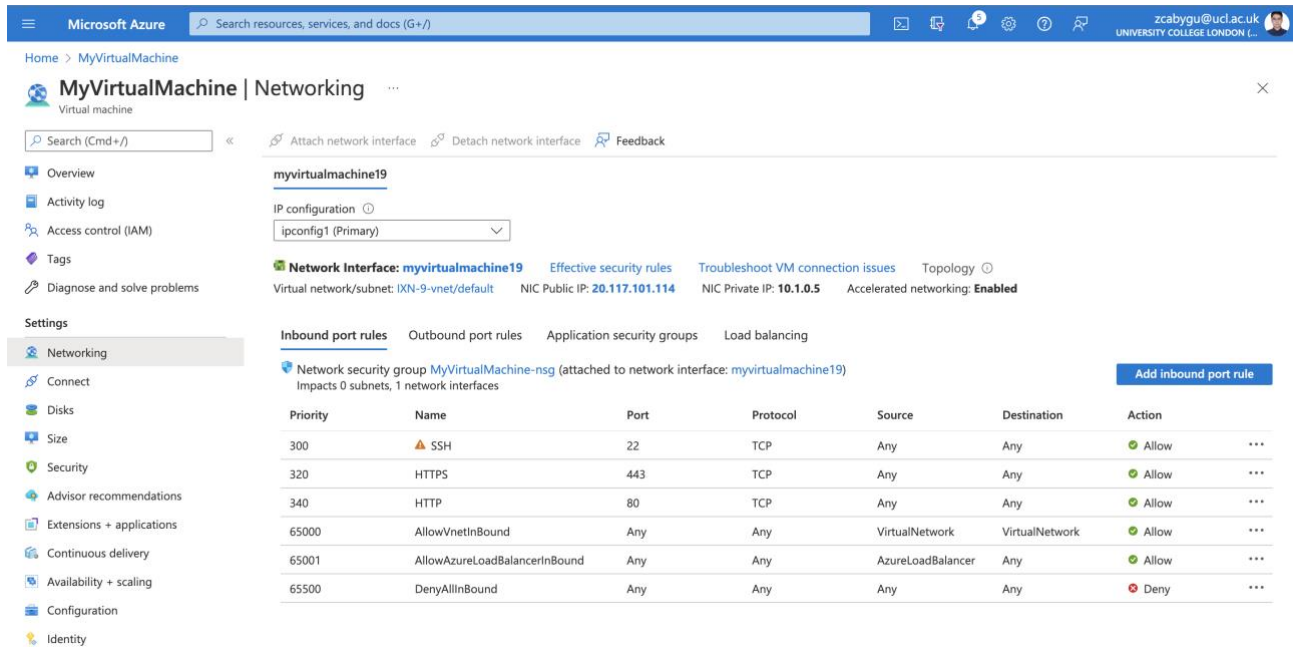
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

User_1@MyVirtualMachine:~$
```

connecting to your virtual machine. Congratulations!

## Step 2.5. Set inbound port networking rule

4. Enter the Networking page of your virtual machine on azure portal by clicking the left catalog.



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Home > MyVirtualMachine

MyVirtualMachine | Networking

Virtual machine

Search (Cmd+/) Attach network interface Detach network interface Feedback

Overview  
Activity log  
Access control (IAM)  
Tags  
Diagnose and solve problems

Settings

Networking  
Connect  
Disks  
Size  
Security  
Advisor recommendations  
Extensions + applications  
Continuous delivery  
Availability + scaling  
Configuration  
Identity

myvirtualmachine19

IP configuration ipconfig1 (Primary)

Network Interface: myvirtualmachine19 Effective security rules Troubleshoot VM connection issues Topology

Virtual network/subnet: IXN-9-vnet/default NIC Public IP: 20.117.101.114 NIC Private IP: 10.1.0.5 Accelerated networking: Enabled

Inbound port rules Outbound port rules Application security groups Load balancing

Network security group MyVirtualMachine-nsg (attached to network interface: myvirtualmachine19)  
Impacts 0 subnets, 1 network interfaces

Priority	Name	Port	Protocol	Source	Destination	Action	
300	SSH	22	TCP	Any	Any	Allow	...
320	HTTPS	443	TCP	Any	Any	Allow	...
340	HTTP	80	TCP	Any	Any	Allow	...
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow	...
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any	Allow	...
65500	DenyAllInBound	Any	Any	Any	Any	Deny	...

Add inbound port rule

5. Click the 'Add inbound port rule' blue button on the left hand side.

6. Set the Destination port ranges to 8080 (usually it is the default) and left other options unchanged. Click **Add** and finished.

The screenshot shows the Microsoft Azure portal interface for configuring a Network Security Group (NSG) for a virtual machine. The main pane displays the 'myvirtualmachine19' network interface configuration, including IP configuration (ipconfig1) and network interface details. The 'Inbound port rules' table is visible, listing rules for SSH, HTTPS, HTTP, and various Vnet/LoadBalancer rules.

Priority	Name	Port	Protocol
300	SSH	22	TCP
320	HTTPS	443	TCP
340	HTTP	80	TCP
65000	AllowVnetInBound	Any	Any
65001	AllowAzureLoadBalancerInBound	Any	Any
65500	DenyAllInBound	Any	Any

The 'Add inbound security rule' dialog is open on the right, with the following settings:

- Source: Any
- Source port ranges: \*
- Destination: Any
- Service: Custom
- Destination port ranges: 8080
- Protocol: Any (selected)
- Action: Allow (selected)

### Step 3. Download the web application package

1. Clone the web application package

- Enter command : **'git clone https://github.com/Yufei-Gu-451/IXN-Team-9.git'**

2. Clone the Bert module into the app directory

- Enter command : **'git clone https://github.com/google-research/bert.git IXN-Team-9/app/bert'**

3. Download a pre-trained BioBERT model from

<https://github.com/naver/biobert-pretrained.git> to your computer. The first model is used as a sample **BioBERT-Base v1.1 (+ PubMed 1M)** - based on BERT-base-Cased (same vocabulary).

4. Decompress the downloaded pre-trained BioBERT model file on your computer.



# BioBERT Pre-trained Weights

This repository provides pre-trained weights of BioBERT, a language representation model for biomedical domain, especially designed for biomedical text mining tasks such as biomedical named entity recognition, relation extraction, question answering, etc. Please refer to our paper [BioBERT: a pre-trained biomedical language representation model for biomedical text mining](#) for more details.

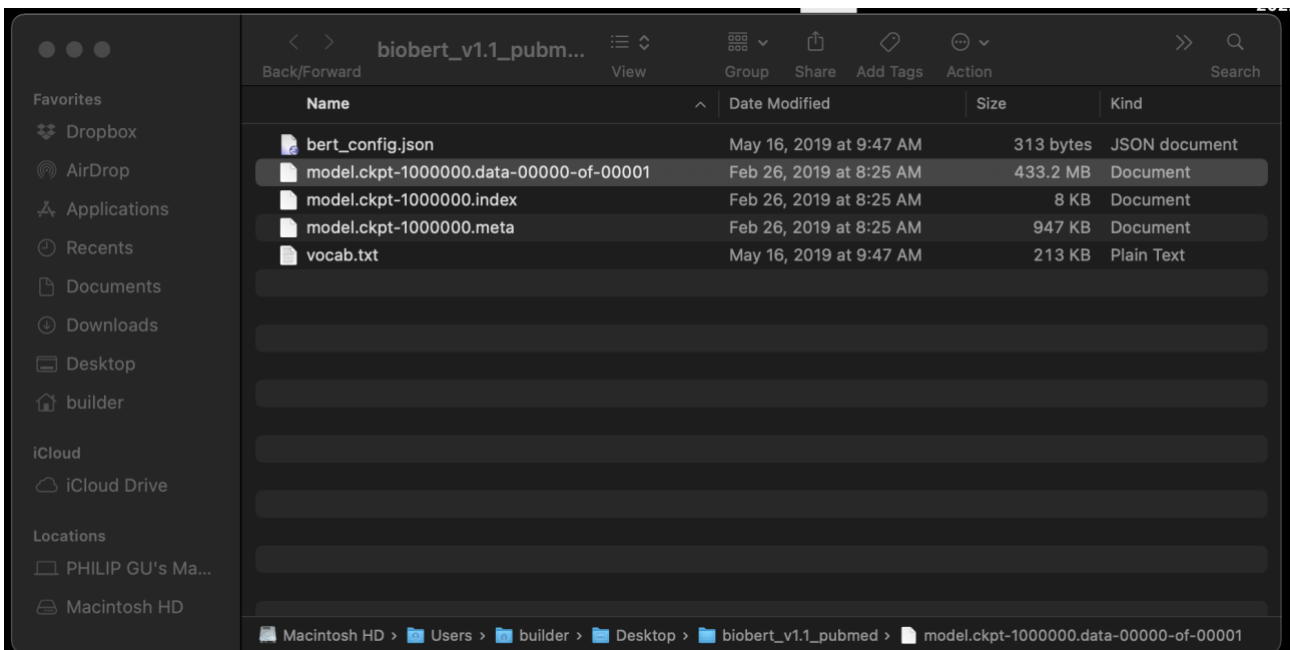
## Downloading pre-trained weights

Go to [releases](#) section of this repository or click links below to download pre-trained weights of BioBERT. We provide three combinations of pre-trained weights: BioBERT (+ PubMed), BioBERT (+ PMC), and BioBERT (+ PubMed + PMC). Pre-training was based on the [original BERT code](#) provided by Google, and training details are described in our paper. Currently available versions of pre-trained weights are as follows:

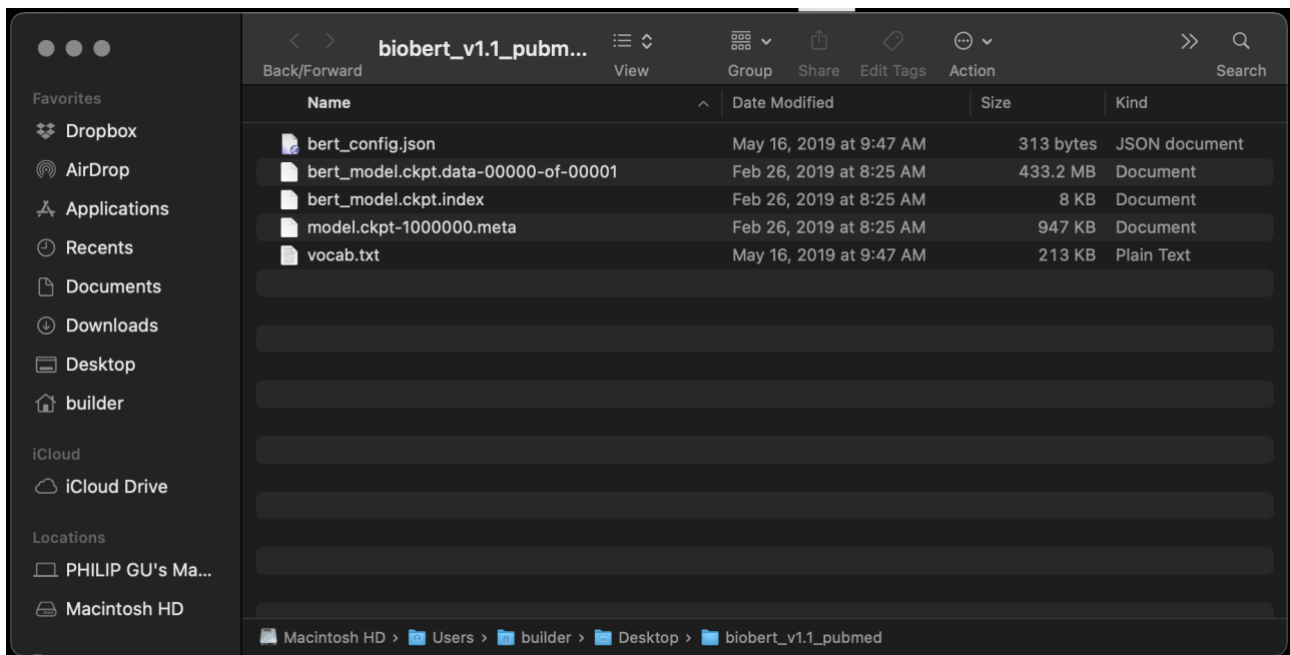
- [BioBERT-Base v1.1 \(+ PubMed 1M\)](#) - based on BERT-base-Cased (same vocabulary)
- [BioBERT-Large v1.1 \(+ PubMed 1M\)](#) - based on BERT-large-Cased (custom 30k vocabulary), [NER/QA Results](#)
- [BioBERT-Base v1.0 \(+ PubMed 200K\)](#) - based on BERT-base-Cased (same vocabulary)
- [BioBERT-Base v1.0 \(+ PMC 270K\)](#) - based on BERT-base-Cased (same vocabulary)
- [BioBERT-Base v1.0 \(+ PubMed 200K + PMC 270K\)](#) - based on BERT-base-Cased (same vocabulary)

Make sure to specify the versions of pre-trained weights used in your works. If you have difficulty choosing which one to use, we recommend using [BioBERT-Base v1.1 \(+ PubMed 1M\)](#) or [BioBERT-Large v1.1 \(+ PubMed 1M\)](#) depending on your GPU resources. Note that for BioBERT-Base, we are using WordPiece vocabulary ( `vocab.txt` ) provided by Google as any new words in biomedical corpus can be represented with subwords (for instance, Leukemia => Leu + ##ke + ##mia). More details are in the closed [issue #1](#).

5. Change the name of 'model.ckpt\_100001.\*' to 'bert\_model.ckpt.\*', and copy the files to the BERT directory.



The original file you get from download



The files after renamed

6. Sent the pre-trained BioBERT model to the virtual machine you just created.

- Open the terminal on your computer
- Type in command **'scp <Default Download Directory>/biobert\_v1.1\_pubmed/bert\_config.json <VM username>@<VM Public IP address>:IXN-Team-9/app/bert'**
- Type in command **'scp <Default Download Directory>/biobert\_v1.1\_pubmed/bert\_model.ckpt.data-00000-of-00001 <VM username>@<VM Public IP address>:IXN-Team-9/app/bert'**
- Type in command **'scp <Default Download Directory>/biobert\_v1.1\_pubmed/bert\_model.ckpt.index <VM username>@<VM Public IP address>:IXN-Team-9/app/bert'**
- Type in command **'scp <Default Download Directory>/biobert\_v1.1\_pubmed/bert\_model.ckpt.meta <VM username>@<VM Public IP address>:IXN-Team-9/app/bert'**
- Type in command **'scp <Default Download Directory>/biobert\_v1.1\_pubmed/vocab.txt <VM username>@<VM Public IP address>:IXN-Team-9/app/bert'**

Hints to the top five commands:

- (When it asks for password, enter the password of your virtual machine)
- Replace **<Default Download Directory>** to the directory of your BioBERT model package.

- Replace **<VM username>** with the username you set when you create the virtual machine.
- Replace **<VM Public IP address>** with the public IP address of your virtual machine.
- If you have downloaded a different BioBERT model, replace **<biobert\_v1.1\_pubmed>** to the exact file name of the BioBERT model.

#### **Step 4. Set up the python environment and deploy the web app**

1. Download the python3.7 dev package on your virtual machine.

- Enter command : **'sudo apt install software-properties-common'**
- Enter command : **'sudo add-apt-repository ppa:deadsnakes/ppa'** (Press enter as hinted during installation)
- Enter command : **'sudo apt-get install python3.7-dev'**

2. Install pip for python 3.7 package

- Enter command : **'sudo apt install python3.7 python3-pip'** (Press Y as hinted during installation)

3. Install the mysql server and the unixodbc driver

- Enter command : **'sudo apt-get install mysql-client'** (Press Y as hinted during installation)
- Enter command : **'sudo apt install unixodbc-dev'** (Press Y as hinted during installation)
- Enter command : **'sudo apt install libmysqlclient-dev'** (Press Y as hinted during installation)

4. Install all required package for the web application

- Enter command : **'sudo python3.7 -m pip install -r IXN-Team-9/requirements.txt --no-cache-dir'**

5. Download the required NLTK package

- Enter command : **'python3.7 IXN-Team-9/nltkConfig.py'**

6. Run the application

- Enter command : **'python3.7 IXN-Team-9/application.py'**

If everything is successful, you will see the following text, representing the

```
User_1@MyVirtualMachine:~/IXN-Team-9$ python3.7 application.py
* Serving Flask app 'app' (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: on
* Running on all addresses.
  WARNING: This is a development server. Do not use it in a production deployment.
* Running on http://10.1.0.5:8080/ (Press CTRL+C to quit)
* Restarting with stat
* Debugger is active!
* Debugger PIN: 169-088-158
144.82.9.234 - - [29/Mar/2022 22:18:38] "GET / HTTP/1.1" 200 -
144.82.9.234 - - [29/Mar/2022 22:18:39] "GET /static/favicon.ico HTTP/1.1" 200 -
144.82.9.234 - - [29/Mar/2022 22:18:39] "GET /static/favicon.ico HTTP/1.1" 304 -
144.82.9.234 - - [29/Mar/2022 22:18:43] "GET /auth/login HTTP/1.1" 200 -
```

deployment of your web application is now successful!

You can now use the IP address of your virtual machine and the port number **<Public IP address>:8080** to access the web application from any computer!