

DATA 516 - Section 6

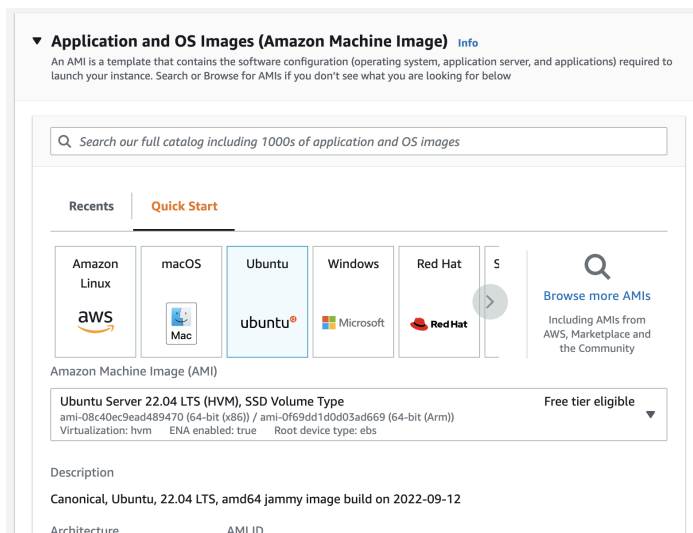
Part 1: Setting up Souffle in AWS Academy

Soufflé is a **logic programming language** inspired by **Datalog**. It overcomes some of the limitations in classical Datalog. For example, programmers are not restricted to finite domains, and the usage of functors (intrinsic, user-defined, etc.) is permitted.

More on Souffle: <https://souffle-lang.github.io/tutorial>

Intrinsic functors: cat, strlen, substr(string,index,length), ord

1. Go to AWS Academy Account > Modules > Learner Lab
2. Click on Start Lab
3. When “AWS” icon becomes Green, click on it to launch AWS Console
4. Select EC2 > Launch Instance
5. Under the Application and OS Images(Amazon Machine Images)> Quick Start> Ubuntu



6. Architecture> 64-bit(x86)
7. Instance type> t2.large
8. Key pair > vockey(type: rsa)

▼ Instance type [Info](#)

Instance type

t2.large
 Family: t2 2 vCPU 8 GiB Memory
 On-Demand Linux pricing: 0.0928 USD per Hour
 On-Demand Windows pricing: 0.1208 USD per Hour

[Compare instance types](#)

▼ Key pair (login) [Info](#)

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

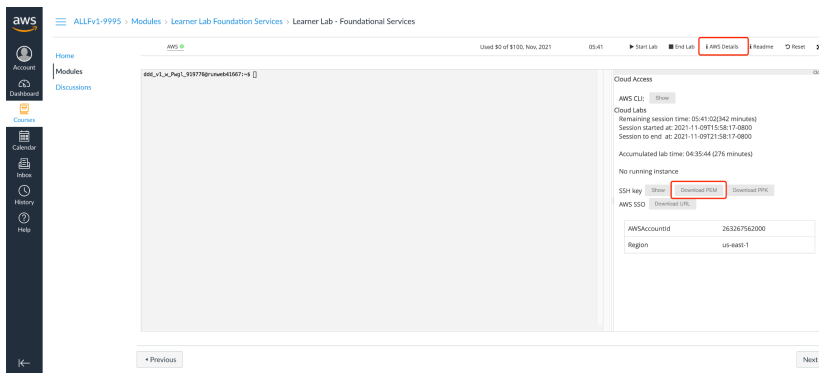
Key pair name - *required*

vockey

[Create new key pair](#)

9. Click on 'Launch Instance'.

10. To connect to your instance, you need to download the key. Go back to AWS Academy canvas page and click on AWS details and click on Download PEM (for Linux and Mac). For Windows users, Click on download PPK instead (read more in Readme)



Accessing EC2 Instance(s)

When launching EC2 instances in the default us-east-1 Region in this environment, choose the option to use the existing key pair named **vockey** at the time of launch. Then:

- Choose the **i AWS Details** link above these instructions.
 - If you are using a Windows desktop or laptop, choose the **Download PPK** button and save the **labuser.ppk** file. You can use this file to connect via SSH to a Linux EC2 instance or Windows EC2 instance, typically using a tool such as PuTTY.
 - If you are using a MacOS desktop or laptop, choose the **Download PEM** button and save the **labuser.pem** file. You can use this file to connect via SSH to a Linux EC2 instance or Windows EC2 instance, typically using a terminal window.

Part 2

1. **(For Mac Users)** In your terminal, run the following command:

```
chmod 400 labuser.pem
```

2. **(For Mac Users)** Connect to your EC2 instance by SSH by running the following command:

```
ssh -i labsuser.pem ubuntu@[Your EC2 instance Public IPv4 DNS]
```

For example, `ssh -i labsuser.pem`

ubuntu@ec2-35-170-202-157.compute-1.amazonaws.com

3. **(For Windows Users)** Open your Instance on EC2 > Click on Connect > Under EC2 Instance Connect, click on Connect.

4. In your Ubuntu SSH, run the following command to download Souffle:

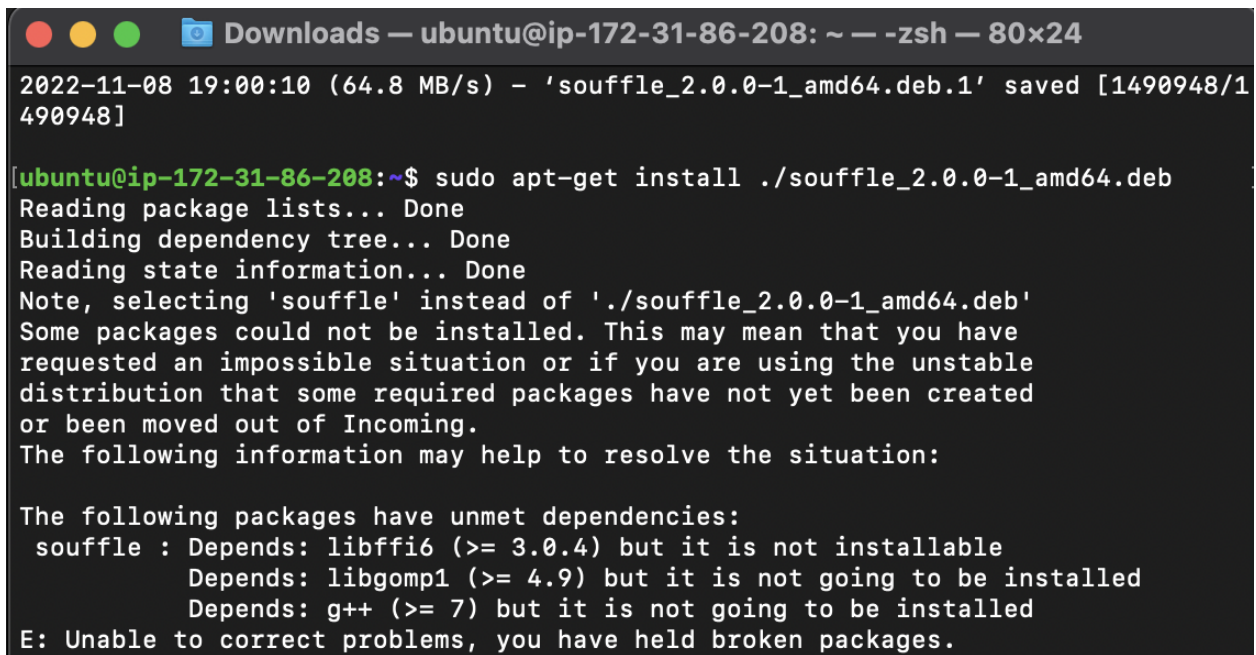
```
wget
https://github.com/souffle-lang/souffle/releases/download/2.0.0/souffle_2.0.0-1_amd64.deb
```

5. Now run:

```
sudo apt-get update
sudo apt-get install ./souffle_2.0.0-1_amd64.deb
```

If you get any errors, you may want to follow steps 5 to 9

6. You might get the following error:



```
Downloads — ubuntu@ip-172-31-86-208: ~ — -zsh — 80x24
2022-11-08 19:00:10 (64.8 MB/s) - 'souffle_2.0.0-1_amd64.deb.1' saved [1490948/1490948]
[ubuntu@ip-172-31-86-208:~$ sudo apt-get install ./souffle_2.0.0-1_amd64.deb
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, selecting 'souffle' instead of './souffle_2.0.0-1_amd64.deb'
Some packages could not be installed. This may mean that you have
requested an impossible situation or if you are using the unstable
distribution that some required packages have not yet been created
or been moved out of Incoming.
The following information may help to resolve the situation:

The following packages have unmet dependencies:
souffle : Depends: libffi6 (>= 3.0.4) but it is not installable
          Depends: libgomp1 (>= 4.9) but it is not going to be installed
          Depends: g++ (>= 7) but it is not going to be installed
E: Unable to correct problems, you have held broken packages.
```

In this particular error, you'll have to install all the dependencies of Souffle before you can install souffle through the .deb file

If you're facing any other errors, please check out the following link or contact the professor or TAs:

<https://askubuntu.com/questions/1109982/e-could-not-get-lock-var-lib-dpkg-lock-frontend-open-11-resource-temporari>

7. Run the following commands to install g++ and libgomp1:

```
sudo apt-get install g++
sudo apt-get install libgomp1
```

8. To install libffi6, you will need to download the .deb file from an online resource by running the following command:

```
wget
http://ftp.de.debian.org/debian/pool/main/libf/libffi/
libffi6_3.2.1-9_amd64.deb
```

9. Run the following command to install libffi6:

```
sudo apt-get install ./libffi6_3.2.1-9_amd64.deb
```

10. Now, install souffle in your SSH:

```
sudo apt-get install ./souffle_2.0.0-1_amd64.deb
```

11. Running vim to create a datalog file:

<https://www.cyberciti.biz/faq/vim-new-file-creation-command-on-linux-unix/>

12. Paste the following into your vim file:

```
.decl edge (n: symbol, m: symbol)
edge ("a","b"). /* facts of edge */
edge ("b","c").
edge ("c", "b").
edge("c","d").
.decl reachable (n: symbol, m: symbol)
.output reachable // output relation reachable
reachable(x, y):- edge(x, y). // base rule
reachable(x, z):- edge(x, y), reachable(y, z). //
inductive rule
```

13. Return to the SSH and run the following command to create the reachable.csv file:

```
souffle example.dl
```

14. To see the csv file run vim reachable.

15. Make sure to Stop your EC2 instance!!!