**Ubuntu ARM64 VM Setup Guide for Mac**

Step-by-step outline for students to successfully set up and connect to an Ubuntu VM. This creates a **pre-built** Ubuntu server VM that you can use freely to create as many VMs as you desire. Packer build allows some provisioning, as does the Vagrantfile that will be created via a bash shell script (**setup.sh**).

Check the shell script for details of what it's creating in terms of directories and files. Feel free to add any details to any files or create your own files and script logic to finish the Summative Assessment.

After working through the processes below, you will be able to SSH into your VM!

**Prerequisites**

* macOS with Apple Silicon (M1/M2/M3/M4)
* Administrative access to install software

**Setup Process**

**1. Install Required Software**

* Install Parallels Desktop
* Install Vagrant (must be in your PATH)

**2. Run the Setup Script**

* Navigate to the project root directory
* Run the setup script via Terminal: ./setup.sh
* The script will:
  + Install the vagrant-parallels plugin if needed
  + Add the Ubuntu ARM64 box if not already added
  + Start the VM with Parallels

**3. What Happens During Setup**

* The script creates a VM with:
  + Ubuntu 22.04 LTS (ARM64)
  + 2GB RAM and 2 CPU cores
  + Faster VM mode enabled for Parallels

**4. Connecting to the VM (from project root/ubuntu-arm64-project/output)**

* Run the setup.sh script which is what installs the Vagrant-Parallels plugin, adds the Ubuntu ARM64 box, and starts the VM
* After successful setup, use the command: vagrant ssh
* Login credentials:
  + Username: vagrant
  + Password: vagrant
* The VM will display its IP address on boot

**5. VM Management Commands**

* Stop the VM: vagrant halt
* Remove the VM: vagrant destroy

**Troubleshooting Tips**

* If you see errors about Parallels or Vagrant not found, ensure they're installed and in your PATH
* If the box fails to download, check your internet connection
* If the vagrant-parallels plugin installation fails, try vagrant plugin repair

**Understanding What's Happening**

The automation script:

1. Creates a Packer template that sets up your environment
2. Generates a Vagrantfile configured for Ubuntu on Parallels
3. Creates helper scripts to manage your VM
4. Sets up documentation

Vagrant then:

1. Downloads the pre-built Ubuntu ARM64 box
2. Creates a VM based on that box
3. Configures the VM environment
4. Establishes SSH access

This approach gives you a fully functional Ubuntu environment with SSH access with minimal setup time and complexity!