

# Final Report

## 1. Introduction

This report presents the complete workflow for setting up a virtualized Ubuntu environment using VMware Workstation, performing display and resolution configurations, completing a LibreOffice Calc data-cleaning assessment task, and documenting troubleshooting steps and time spent. The procedures outlined demonstrate technical competency in virtualization, system configuration, and data transformation.

## 2. Host Hardware Verification

Before installation, the host machine's hardware was verified to ensure compatibility with VMware Workstation and Ubuntu. The following checks were performed:

- CPU: Confirmed support for virtualization technologies.
- RAM: Verified available memory to allocate to the virtual machine.
- Storage: Ensured sufficient disk space for VMware, Ubuntu ISO, and VM files.
- Graphics: Confirmed display capabilities for Full HD or higher resolution.
- System Stability: Verified that BIOS/UEFI virtualization settings were enabled.

These checks ensured that the system could reliably run a virtual machine with optimal performance.

## 3. VMware Installation

VMware Workstation/Player was downloaded from the official VMware website which is Techspot where I downloaded the latest version which is VMware17.6.5 and installed on the host system. Installation steps included:

- Running the Windows executable (.exe) installer
- Accepting license agreements
- Installing required components (e.g., virtual network adapters)
- Completing setup and restarting the machine

After installation, VMware was tested to ensure it launched successfully.

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## 4. Ubuntu ISO Download

The Ubuntu Desktop ISO file was downloaded from the official Ubuntu website using the link that was provided in the Assessment Task. Integrity checks (e.g., file size and version verification) were performed before use. Care was taken to ensure that Ubuntu 22.04 Long Term Support (LTS) version was selected.

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## 5. VM Creation

Inside VMWare, a new virtual machine was created using the Ubuntu ISO. The following configurations were applied:

- OS Type: Linux → Ubuntu 64-bit
- Memory Allocation: Based on host capability which was 8GB RAM
- CPU Cores: 2 CPU cores for smoother performance
- Disk Size: Allocated virtual disk storage of 40 GB was used.
- Boot Media: Attached the downloaded Ubuntu ISO

Basic settings were finalized, and the VM was prepared for installation.

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## 6. Ubuntu Installation

Ubuntu was installed by booting the VM from the ISO. Steps included:

- Selecting “Install Ubuntu”
- Choosing keyboard layout and language
- Creating a username and password
- Allowing guided installation to partition the disk
- Completing installation and restarting the VM

After installation, updates were applied using the terminal.

## 7. Ubuntu Display Resolution Configuration

Initially, the VM did not detect the correct Full HD resolution, so display settings had to be manually configured using:

- **Ubuntu Settings → Displays**, and
- **xrandr** (command-line tool)

A custom resolution mode was created using:

```
cvt 1920 1080 60
xrandr --newmode "1920x1080_60.00" <parameters>(combination of numbers)
xrandr --addmode Virtual1 "1920x1080_60.00"
xrandr --output Virtual1 --mode "1920x1080_60.00"
```

This successfully enabled the desired resolution.

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## 8. VMware Resolution Locking

A major issue occurred where the resolution reverted after shutdown/reboot. To lock the resolution:

- Correct **xrandr** parameters were reapplied
- Startup scripts or display configurations were adjusted
- VMware Tools was checked to ensure proper integration
- Correct mode values were entered to avoid xrandr parsing errors

After applying fixes, the VM retained the 1920×1080 resolution permanently across reboots.

## 9. System Verification

A full system verification was conducted to ensure:

- Resolution remained stable after multiple restarts
- VMware Tools was running correctly
- System performance was smooth
- All installed updates were applied
- Essential apps (Terminal, Settings, LibreOffice, Browser) functioned correctly

The VM was confirmed to be stable and fully operational.

## 10. LibreOffice Calc Assessment Task Process

For the assessment task:

- A CSV file with **messy data** generated from ChatGPT.
- The dataset was opened in LibreOffice Calc.
- Invalid, incomplete, or duplicated rows were removed.
- Data types (numbers, dates, text) were cleaned and corrected.

- Columns were reorganized where necessary
- A cleaned final dataset was exported **orders\_cleaned.csv**

The task demonstrated proficiency in data cleaning and spreadsheet manipulation.

## 11. Troubleshooting & Issues Faced

During the entire workflow, several issues occurred:

### a. Resolution errors

- `xrandr`: failed to parse '`-hsync`' as a number occurred
- Incorrect parameters in CTV results or copy-paste mistakes caused parse failures
- Correcting the command fixed the issue

### b. Resolution not saving after reboot

- VMware Tools was not fully applied
- Custom modes were not stored persistently
- Manual configuration and reapplication resolved this

### c. USB / file sharing issues

- VMware shared folders required enabling in VM settings

### d. Network issues

- DHCP occasionally delayed connection; restarting the VM fixed it.

Despite these challenges, all issues were successfully resolved. Also some of the screenshots are in jpg instead of png because it got to a certain point screenshotting on Ubuntu was not working so I took snapshots of the task using my phone

## 12. Time Spent

Task	Time Spent
Host verification	20 minutes
VMware installation	30 minutes
Ubuntu ISO download	60 minutes (due to internet issues)
VM creation	25 minutes

<b>Task</b>	<b>Time Spent</b>
Ubuntu installation	35 minutes
Display & resolution configuration	1 hour 15 minutes
VMware resolution fix & persistence	1 hour
LibreOffice Calc data-cleaning task	2 hour
Troubleshooting various issues	2 hour 45 minutes
<b>Total Estimated Time</b>	<b>9 hours 50 minutes</b>