CS311 – Assignment 2
Due Date: Sunday, 18 May 2025

Section A: Virtualization Software

Part 1 – Android Virtual Machine

Using **Oracle VirtualBox**, demonstrate the following:

1. **Configure a virtual machine (VM01)** to deploy **Android OS** with Internet access.
   o Choose either 32-bit or 64-bit Android.
   o Allocate appropriate resources (RAM, CPU, video/graphics, network settings).
2. **Explore the Device Care feature** on the virtual Android device, covering:
   o Battery, storage, memory, performance management, and security settings.
3. **Simulate downloading an app** (e.g., *Candy Crush*) and show:
   o Impact on performance (memory and CPU usage).
   o Strategies to optimize overall user experience.

Part 2 – Windows Server 2022

Using **Oracle VirtualBox**, complete the following on a virtual machine labelled **VM02**:

a. Install **Windows Server 2022 (Desktop Experience)** using a host-only or internal network adapter.
b. During setup, select **Custom** and partition a **256 GB disk** into **two 128 GB partitions** (note: setup may create additional reserved partitions).
c. Set the **Administrator password** to `SecureIT!!`.
d. Configure the **domain name** as `Sxxxxxxx.com` (use the group leader's ID).
e. Assign a **Class C network address**, for example:

- IP Address: `192.168.X.X`
- Subnet Mask: `255.255.255.0`
- Default Gateway: `192.168.X.X`
- Preferred DNS: `192.168.X.X`
  f. Extend the disk partition to add an **additional 64 GB**.
  g. Configure **virtual memory** to use **2 GB** for page caching.
  h. Provision the OS to implement a **storage pool with RAID**:
- Choose an appropriate RAID level (e.g., RAID 1 for mirroring or RAID 5 for striping with parity).

- Explain the benefits of your RAID choice for **data redundancy** and **performance**.
    i. **Secure the disk using BitLocker** drive encryption. Save the recovery keys securely.
    j. Demonstrate how to **unlock the encrypted drive** with the recovery key.

Part 3 – Client OS Integration

Using **Oracle VirtualBox**, demonstrate the following:

a. Install a **Client OS (Windows 10/11)** labelled **VM03** and **join it to the Server** created in Part 2.
b. Log in with appropriate credentials.
c. Map the **storage pool** to the client OS so clients can securely save data.
d. **Test the RAID setup** by simulating a disk failure and verifying data integrity and recovery.
e. Evaluate the use of **RAID**, **storage pools**, **BitLocker**, **virtual memory (paging)**, and **disk partitioning**.