**Assignment 1**

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**1. PART I: Confirm UNT Student Email Address (10 Points)**

1.1 What is the student’s UNT email address (…@my.unt.edu)?

**azhansaleem@my.unt.edu**

1.2 Has the student received the Welcome-to-the-Class message via his/her email?

**Yes, I did.**

1.3 If NO to Question 1.2, can the student access the student email (…@my.unt.edu)?

**N/A**

1.4 Is the student a UNT employee?

**No**.

1.5 If YES to Question 1.4, does he/she prefer using the UNT employee email for class communication?

**N/A**

1.6 If YES to Question 1.5, what is the student’s UNT employee email?

**N/A**

**SUBMISSION REQUIREMENT #1: --) Provide a short paragraph to specify which operating system has been selected and to state that the student can use it effectively.**

I have chosen Windows as my preferred operating system, and I can confidently navigate its intricacies with a high level of proficiency. My knowledge encompasses the fundamental components of Windows, including drives, directories, folders, files, ownership status, and administrative privileges. I excel in basic operations, such as creating and managing directories, saving, and retrieving content, downloading, and installing software applications, and using terminals for command lines. Moreover, I am well-equipped to troubleshoot and resolve issues related to both the Windows operating system and the host computing device. My research skills developed through tools like Google search, enable me to find solutions independently, and I am comfortable seeking technical support from relevant vendors and engaging in helpful discussions on technical forums. Overall, my effective use of Windows extends to both routine tasks and problem-solving scenarios, making it my OS of choice for various computing needs.

**PART III: Set Up Deep Learning Virtual Machine (VM) in GCP (20 Points)**

**Brief Report: Setting Up Remote Server on Google Cloud Platform (GCP)**

I successfully set up a remote server on Google Cloud Platform (GCP) by following the prescribed steps. The major milestones in this process included:

Google Cloud Console Login:

* Logged into the Google Cloud Console using my GCP credentials.

Compute Engine Configuration:

* Navigated to the "Compute Engine" section within the console.
* Initiated the creation of a new instance by clicking on "Create."
* Configured the VM by selecting an image containing the necessary deep learning frameworks and adjusting settings such as machine type and disk size.

VM Deployment:

* Launched the instance by clicking "Create" and patiently waited for the deployment process to complete.

**SCREENSHOT:**

A screenshot of a computer

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**Google Cloud SDK Installation on Windows**

For this task, I installed the Google Cloud SDK on my Windows computer to enable interaction with Google Cloud Platform services.

*Here are the Steps:*

1. **Download and Run Installer:**
   * Visited the Google Cloud SDK download page for Windows.
   * Downloaded the installer executable.
   * Double-clicked the installer to run it.
2. **Configuration Choices:**
   * Selected installation location and added SDK components to the system PATH.
3. **Completion:**
   * Waited for the installation to finish.
   * Clicked "Finish" to complete the installation.
4. **Initialization:**
   * Opened the Command Prompt.
   * Ran **gcloud init** to initialize the SDK.
   * Logged in with Google Cloud credentials and configured settings.
5. **Verification:**
   * Checked successful installation with **gcloud --version** in the Command Prompt.

**SCREEN SHOT:**

**A screenshot of a computer program

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**PART IV: Connect Explore Remote VM Using SSH (10 Points)**

**Introduction:**

In this session, I successfully connected to a remote virtual machine (VM) on the Google Cloud Platform (GCP) and performed various tasks related to file system exploration and directory management**.**

**1. SSH Connection (Question 3.1):**

I initiated an SSH connection to the remote VM named "azhan-5560" using the Google Cloud SDK. The command used was:

gcloud beta compute ssh azhan-5560 --project=marine-champion-413421 --zone=us-central1-a

**2. Exploring the File System (Question 3.2):**

Upon establishing the SSH connection, I navigated through the file system of the remote VM. Using basic Linux commands, I changed to the home directory and listed its contents. This helped me understand the existing files and directories on the remote VM.

**3. Creating a Sub-Folder (Question 3.3):**

To organize my files, I created a new sub-folder named "JPTR\_NTBK" under the home directory using the command:

mkdir JPTR\_NTBK

**4. Changing the Current Directory (Question 3.4):**

After creating the "JPTR\_NTBK" folder, I changed my working directory to the newly created folder:

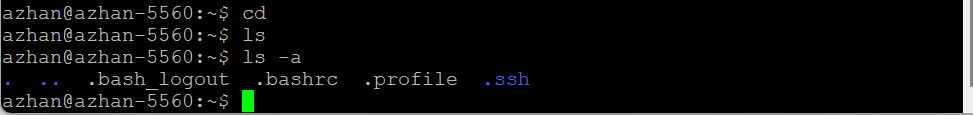
cd JPTR\_NTBK

This enabled me to focus on tasks within the specific directory.

**SCREENSHOTS:**

A screenshot of a computer screen

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**PART V: Start and Connect to Jupyter Notebook in Remote VM (30 Points)**

**Report: Guide to Setting Up and Using Jupyter Notebook on Remote Virtual Machine.**

Introduction:

Today, I embarked on setting up and utilizing Jupyter Notebook on a remote virtual machine (VM). This report chronicles the steps I took to achieve this, aiming to harness the computational power of the remote environment for data analysis and coding tasks.

**Step 1: Starting the Jupyter Notebook Server:**

I began by opening an SSH terminal window to connect to the remote VM. After establishing the connection, I navigated to the directory where I wanted the Jupyter Notebook server to operate. With everything set, I executed the command:

$ jupyter notebook --port=8888

This command initiated the server on port 8888, ensuring that it's ready for action with a default token for authentication.

**Step 2: Forwarding Local Port to Remote Port:**

Switching gears, I opened a GCLOUD SDK terminal window to set up port forwarding. Using the provided command, I SSHed into the remote VM:

gcloud compute ssh us3238394@azhan-5560 --project=marine-champion-413421 --zone=us-central1-a -- -L 8000:localhost:8888

This command established a connection and forwarded my local port 8000 to port 8888 on the remote VM, paving the way for seamless interaction.

**Step 3: Connecting to the Jupyter Notebook Server:**

With the infrastructure in place, I fired up my web browser and entered one of the URLs provided:

http://localhost:8888/tree?token=[TOKEN]

http://127.0.0.1:8888/tree?token=[TOKEN]

I grabbed the token from the URL and pasted it into the login prompt on the Jupyter interface, ensuring secure access to the server.

**Conclusion:**

In conclusion, I successfully set up and connected to Jupyter Notebook on the remote VM. This setup promises efficient utilization of computational resources, enabling me to dive into data analysis and coding projects with ease.

**SCREENSHOTS:**

**A computer screen shot of a computer program

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**A computer screen with text and numbers

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**PART VI: History of AI and Big Data (20 Points)**

A Journey Through Time: The History of Artificial Intelligence (AI)

The human fascination with creating intelligent machines dates back centuries, but the field of AI as we know it today truly blossomed in the mid-20th century. Let's dive into its remarkable journey, exploring its early triumphs, periods of stagnation, and the recent resurgence fueled by Deep Learning and Big Data.

The Dawn of AI: The 1940s and 50s

A group of men working on a machine

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* 1943: Warren McCulloch and Walter Pitts lay the groundwork for artificial neural networks with their model of interconnected artificial neurons.
* 1950: Alan Turing publishes his influential paper, "Computing Machinery and Intelligence," proposing the Turing Test as a criterion for machine intelligence.
* 1956: The Dartmouth Summer Research Project on Artificial Intelligence, organized by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon, is considered the official birth of AI as a field.
* Early milestones: Development of the Logic Theorist program, capable of proving mathematical theorems, and the first self-learning checkers program by Arthur Samuel.

The AI Winter: The 1960s and 70s

* **Limited computational power**: Early computers lacked the processing capabilities to handle complex AI algorithms.
* **Overly optimistic expectations**: Initial breakthroughs led to unrealistic expectations, which couldn't be met, resulting in funding cuts and decreased interest.
* **Knowledge-based AI limitations**: The focus on symbolic reasoning and logic proved insufficient for real-world tasks requiring adaptation and learning.

**The Rekindled Flame: The 1980s and 90s**

* **Expert systems gain traction**: Knowledge-based systems designed for specific tasks like medical diagnosis show promise.
* **Machine learning algorithms advance**: Neural networks and decision trees see improvements, leading to applications in pattern recognition and game playing.
* **A landmark victory:** IBM's Deep Blue defeats chess grandmaster Garry Kasparov in 1997, showcasing the potential of AI.

The Deep Learning Revolution: The 2000s and Beyond

A close-up of a plant

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* **Breakthroughs in neural networks**: The development of efficient training algorithms like backpropagation and the availability of Big Data propel Deep Learning.
* **Image recognition leaps forward**: Deep neural networks achieve superhuman performance on image classification tasks.
* **AI goes mainstream**: Applications in natural language processing, robotics, and self-driving cars emerge, transforming various industries.

**The Role of Big Data:**

**A long hallway with rows of shelves

Description automatically generated**

* **Fueling Deep Learning**: The vast amount of data available allows neural networks to learn complex patterns and improve their performance.
* **Challenges and considerations**: Issues like data privacy, bias, and explainability need to be addressed as AI becomes more integrated into society.

**The Future of AI:**

The field of AI is constantly evolving, with new advancements happening at an accelerating pace. The future holds immense potential for AI to improve our lives in various aspects, from healthcare and education to transportation and sustainability. However, it's crucial to ensure responsible development and ethical considerations to guide AI towards a beneficial future for all.