This document outlines the necessary hardware and software prerequisites, detailed step-by-step setup instructions for both the server-side Oracle environment and the client-side Python application, and configuration options to prepare and deploy the TechInnovators Equipment Tracking System efficiently.

Setup and Configuration Guide

IFS325 Individual Assignment Documentation

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Hardware and Software Prerequisites

Server Environment

- **Hardware:** A server that meets the minimum specifications required to run Oracle Database 21c effectively, ensuring sufficient CPU, memory, storage, and network capacity.
- **Software Stack:**
  - Oracle Database 21c
  - Oracle Application Express (APEX) version 22.2 or later for administrative web interface
  - Oracle REST Data Services (ORDS) for exposing RESTful APIs to clients

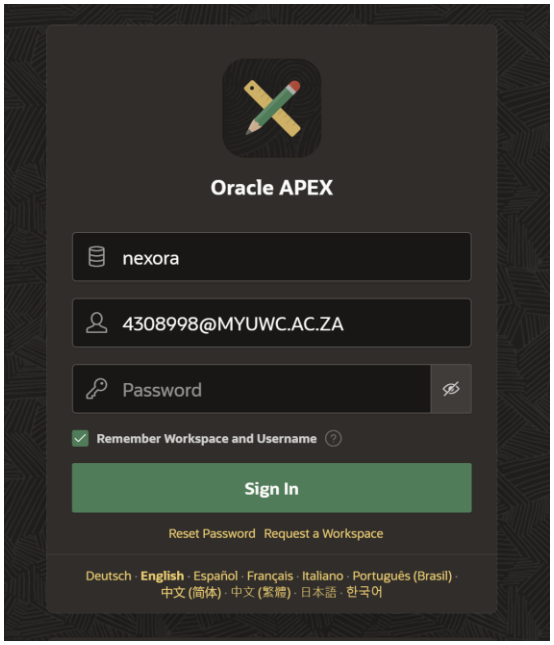
Client Environment

- **Administrative Users:**
  - Access via modern web browsers (e.g., Chrome, Firefox, Edge) with JavaScript enabled for remote management.
- **Employee Users (Python Application):**
  - Workstations running Windows, macOS, or Linux
  - Python 3.9 or later installed
  - Webcam capable of capturing QR codes for secure authentication

Setup Instructions

Server-Side Deployment

1. **Provision Database:**
   - Install and configure Oracle Database 21c on the designated server, ensuring it is operational and accessible.
2. **Install Oracle APEX and ORDS:**
   - Deploy Oracle APEX and configure Oracle REST Data Services (ORDS) inside the database environment following Oracle best practices.
3. **Import APEX Application:**
   - Using APEX Login Credentials, https://oracleapex.com/ords/r/apex/workspace-sign-in/oracle-apex-sign-in?session=111722510497386, insert your credentials, into the target workspace.



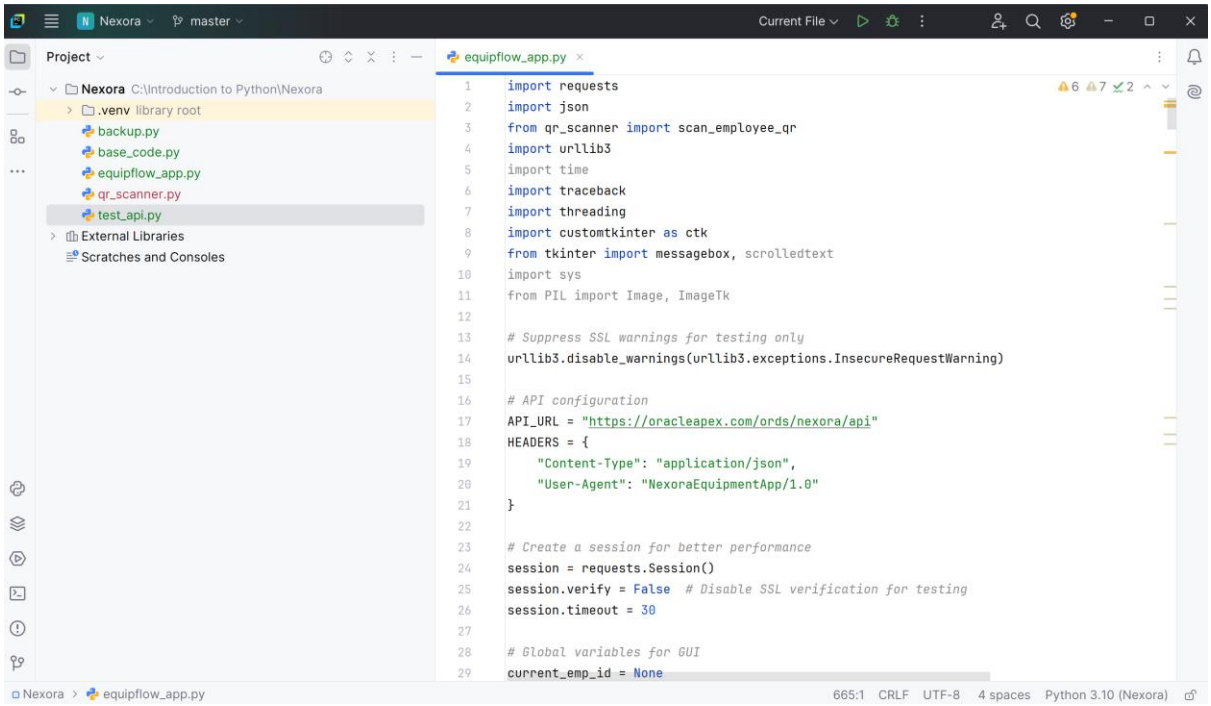
4. **Initialize Schema:**
    - Run the provided SQL scripts to create database tables, sequences, PL/SQL packages, and load initial seed data.
5. **Enable RESTful Services:**
    - Activate the RESTful services on the database tables within ORDS to expose the required APIs for client access.

Client-Side Deployment (Python Application)

1. **Install Python:**
    - Distribute and install Python 3.9 or later on employee workstations.
2. **Install Dependencies:**
    - Using pip, install required libraries by executing:

      text
      pip install requests qrcode[pil] opencv-python pillow customtkinter

3. **Deploy Application:**
    - Distribute the Python client source file (equipflow_app.py) or executable to all user machines.



- Ensure employee QR codes are available for authentication; these are typically provided in an accompanying zip file.

4. **Configure Endpoint:**
   - See the BASE_URL variable in the Python script to point to the Oracle APEX deployed ORDS endpoint (e.g., https://oracleapex.com/ords/nexora/api/).

Configuration Settings and Usage

APEX Application Settings:
Manage authentication schemes, user roles, and other administrative options via "Shared Components" in Oracle APEX.

Inventory Alerts:
The ALERT_THRESHOLD for each equipment category is stored in the EQUIPMENT_CATEGORIES table. Authorized administrators can modify these thresholds via the APEX form or directly in the database.

Client Configuration:
The critical setting for the Python application is the BASE_URL, which must reflect the server's hostname or IP address to establish API connectivity.

Python Application Usage Overview

After setup, employees launch equipflow_app.py and:

- Press **Login via QR code** to open the webcam and authenticate by scanning their employee QR badge.
- Upon successful login, the system welcomes the employee by name and department.
- The interface offers five main functions:
    - Login via QR code
    - View equipment history
    - Return equipment
    - Checkout equipment
    - Exit

For checkouts and returns, an additional form opens in a new tab where the employee selects items from dropdown menus, provides descriptions, marks equipment condition (Good or Damaged), and confirms the action. The system then updates inventory quantities and statuses via Oracle APEX APIs.