Project Problem Description

**Project Objective:**

The objective of this project is to create an AI and computer vision-based kiosk for airport operations that can assist airline passengers in boarding the plane without the need for human intervention.

When fully operational, the kiosk will have several features, including the ability for passengers to scan their ID card and boarding pass at the kiosk. The kiosk will then extract passenger information from the boarding pass and verify it against the ID card.

Additionally, the kiosk will take a 10-second video of the passenger and use facial recognition technology to match the live person at the kiosk with the ID card provided during the scan. The kiosk will also scan the passenger's carry-on baggage to identify any prohibited items and prevent the passenger from boarding if necessary.

If all scanning and validation processes are successful, the kiosk will greet the passenger with a final message indicating that they can board the plane. However, if there are any issues, the kiosk will suggest that the passenger see an airline representative to complete the boarding process and address any issues that arose during the validation process.

**The simulated kiosk experience can be created as below:**

As part of the project, a passenger manifest will be created containing a list of 5 or more passengers who will be boarding the plane. Fabricated digital IDs and boarding passes will also be created for each passenger listed in the manifest.

To test the face recognition system, the project owner's fabricated ID card will be included in the passenger list, and a 15-30 second video of the project owner will be used as the Kiosk face recognition system.

In addition to the passenger scanning process, the kiosk will also scan passenger carry-on items for lighters. If a lighter is detected, the passenger will be flagged for prohibited items in their carry-on baggage.

All of the data collected during the scanning process will be processed using various Azure computer vision services to simulate the automated airline boarding process.

**Input Data Sources:**

* Flight Manifest List for all passengers (5)
* Passenger ID card (5 including one face photo for the project owner)
* Passenger Boarding Pass (5)
* Passenger 15-30 second video showing their face (Sam)
* Passenger carry-on items photo (Please use the sample images provided in the project)

**The Solution Strategy:**

* To extract face and personal information from the passengers' digital IDs, the project will use **Azure Form Recognition digital ID** service. Additionally, a model will be trained using **Azure Form Recognizer** service to extract passenger information from the boarding passes.
* The passenger information extracted from the boarding pass will be validated against the manifest list. If the person's name exists in the manifest list, their identity will be validated using their personal ID.
* To verify the passenger's identity, the face photo extracted from the digital ID will be compared to the face photo extracted from the passenger video using **Azure Video Indexer service.**
* To identify lighters in passenger carry-on items, a machine learning model will be created using **Azure Custom Vision** services. The model will be trained using various lighter images provided in the project. As a learning exercise, the model can be tested using the sample carry-on images provided in the project.
* Finally, once the boarding pass validation is complete, a final message indicating either successful or unsuccessful validation will be displayed.