import hashlib

import random

import time

# Simulated traffic data from sensors

def simulate\_traffic\_data():

intersections = ['A', 'B', 'C', 'D']

traffic\_data = {}

for i in intersections:

traffic\_data[i] = {

'vehicle\_count': random.randint(0, 100),

'avg\_speed\_kmph': round(random.uniform(10, 60), 2)

}

return traffic\_data

# Secure intersection IDs using hash

def secure\_intersection\_id(intersection\_id):

return hashlib.sha256(intersection\_id.encode()).hexdigest()

# Process traffic data

def process\_traffic\_data(data):

for intersection, values in data.items():

congestion\_level = "Low"

if values['vehicle\_count'] > 70 or values['avg\_speed\_kmph'] < 20:

congestion\_level = "High"

elif values['vehicle\_count'] > 40:

congestion\_level = "Medium"

print(f"Intersection: {intersection}")

print(f"Vehicle Count: {values['vehicle\_count']}")

print(f"Avg Speed: {values['avg\_speed\_kmph']} km/h")

print(f"Congestion Level: {congestion\_level}\n")

# CLI Traffic Control Interface

def traffic\_control\_interface():

print("=== Traffic Flow Optimization System ===")

while True:

print("\nOptions:")

print("1. View Simulated Traffic Data")

print("2. Exit")

choice = input("Enter your choice: ")

if choice == '1':

data = simulate\_traffic\_data()

print("\nProcessing Traffic Data...\n")

process\_traffic\_data(data)

elif choice == '2':

print("Exiting system...")

break

else:

print("Invalid choice. Try again.")

if \_\_name\_\_ == "\_\_main\_\_":

traffic\_control\_interface()