CSCI262/CSCI862 System Security

Assignment 3 Report

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# Initial input.

### Data storage

Based on the example Vehicles.txt file, the program will read in the first line which contains the number of vehicle types being monitored and store it as an integer variable.

Then the program will run into a loop which reads in each line in the text file and performs string tokenization using “:” as the delimiter.Then the program stores the whole line as a record as a Vehicle class which contains following member variables: string vehicleName; int parkingFlag; string registration; float volumeWeight; float speedWeight. Besides, the class also has three additional variables: float speed; float beginningTime; bool isParked;

For the file Stats.txt, the program initially read in first line and store it into a strcut with 4 integer variables: int noOfVehicleType; int lengthOfRoad; int speedLimit; int noOfParkingSpaces.

And for the rest, each line, the program uses a loop to read in the data and split them and store the data into a Stats class with following variables: string vehicleType; float numberMean; float numberStdDev; float speedMean; float speedStdDev.

Then we create two vectors to store Stats class and Vehicle class separately.

### Potential inconsistencies

Inconsistency 1: The number given at the first line of count is incorrect.

Solution: We have to read through the file to identify the number of inputs.

Inconsistency 2: Each set of inputs are not terminated by a new line character.

Solution: We have to loop in through each set of objects in order to count the values.

Inconsistency 3: One of the values is missing in the input line.

Solution: Not addressed

Inconsistency 4: An extra space in between the format of the registration number.

Solution: This is addressed by removing the extra space.

Inconsistency 5: The symbol in between each input is not a ':' but something else.

Solution: Not addressed

Inconsistency 6: A null value instead of an input between one ':' and the next ':'

Solution: If the value is a ':', it needs to treated as zero while reading.

Inconsistency 7: There is no value for count at the beginning of the file.

Solution: We have to loop through the file and identify the count. If it's not there, we should be adding the right value.

# Activity engine and the logs.

The activity engine will generate the events, and it will simulate each day, how many vehicles pass the road. The engine will create the registration format, and when they arrive with what speed, when they departure with what speed, whether they park, and the other necessary information such as volume weight and speed weight.

The principle of activity engine is that it uses the random function to generate the number of each type vehicle, and its arrive time between 0 minute to 1440 minute each day, then the speed will be assigned based on the average speed plus or minus a random speed in the range in deviation speed.

Then the activity engine will create one text file for each day.

# Analysis engine.

Analysis engine will calculate the mean speed and standard deviation first, then using them as the base and compare them with the speed of each vehicle, to see if the vehicle exceeds the limitation of speed.

# Alert engine.

The alert engine will inform the administer if it notices that some vehicles exceed the speed or break the rule based on the result generated by analysis engine.