Transport Management System

1) Write down the design for your transport company program in word document using pseudo code. You should list all the functions you think you will need. Then you should write out all the program logic you think you will need. You should also state what information/data each function needs to receive and what type of data it will return.
2) (Future assignment) Refine your design based on what you have learned in the middle of the course.
3) (Future assignment) Write the code to implement your design.
4) (Future assignment) Test your program and make fixes to any bugs.

Program specification / user requirements:

For a passing grade:

- Your program should be function based. That means that nearly all features should take place in user-defined functions.
- Your program should include a main menu for the user and use a master loop to control the program until the user opts to quit.
- Your program should have two types of users - company and customer. Options for each should be visible based on the type of user engaged with the software.
- Input by the user should be validated (i.e. numbers are in the correct range).
- At a minimum, customers should be able to book passage/cargo transport, change, and remove reservations.
- At a minimum, company users should be able to add/remove routes, add/remove vehicles, add/remove destinations.
- You may set a limit on how many vehicles, routes, and destinations may be used in the program. For example, you could define the size of your multidimensional arrays at compile time if desired.
- Meeting minimums that compile and run without runtime or logic errors will ensure a passing grade.

For a grade of "B" or higher:

- Add at least one additional functionality such as managing staffing (any), recreation (cruise), etc.
- Write your program so that your data can be stored in data files prior to closing the program.
- Write your program so that your data can be loaded from data files when it starts.

For a grade of "A" or higher:

- To earn an "A" a team must add additional functionality that implements all of the following:
  - Structs
  - Searching
  - Sorting

Additional hints/tips:

- Students will need to use everything we have learned in the course about variables, flow control, arrays, pointers, and structs to successfully implement this program.
- Start early.
- Set a meeting plan for the team.
- Submit one draft design per team.

Hotel Management System

Program Specification / User Requirements:
Guests should be able to book rooms, change reservations, and view their bookings.
Staff should be able to add/remove rooms, manage bookings, and view room availability.
You may set a limit on how many rooms may be used in the program. For example, you could define the size of your arrays at compile time if desired.

Electrical Circuit Simulator

Designers should be able to:
a. Add/remove components (resistors, capacitors, inductors, voltage sources, etc.) to the circuit.
b. Edit component properties (e.g., resistance value, capacitance, etc.).
c. View the circuit diagram.
Testers should be able to:
a. Simulate the circuit and view the output (voltage across components, current flow, etc.).
b. Analyze circuit performance (voltage drop, power dissipation, etc.).
c. Save simulation results for future reference.
You may set a limit on the number of components or nodes in the circuit.