

**Regina Engineering Competiton Programming Documentation**

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## The Problem:

You have been tasked by a shipping company to create a logistical management tool for shipping from one warehouse to another. Their shipping is done via semi, using one or more trailers with a single driver, and they must ensure they are following all Canadian long-haul laws.

This application must allow a logistical manager to see do the following

1. See an overview of all active trucks and drivers and must show the following:
   1. The driver’s name, truck number and trailer number
   2. The destination of the trip
   3. Total time for the trip (rough estimate)
   4. Time remaining on this trip
   5. Start Date and time of the trip
2. Create a new shipment
   1. Not allow a shipment to be scheduled if it would break regulations
   2. Select a start point, start time, and end point
   3. Select the driver, truck, and trailer
   4. Flag when a driver and/or unit is not supposed to be at the warehouse that this trip starts at
3. Get a time estimate of how long a shipment will take
   1. Include all required rest times for the driver
   2. Can be based on an average driving speed provided with the route data
   3. If using external distance/time data, this must be noted in the presentation
4. Set the driver schedule according to 14 days working, 7 days off schedule.
   1. There should always be 1 B-train capable driver on each shift
   2. The shifts should be divided according to the user and may not always be an even amount.

## Regulation Need to Know

Canadian Hours of Service regulations are as follows:

1. A driver can only work 14 hours and drive 13 hours in a day due to Canadian law
2. Must have 8 hours off consecutively after working 14 hours on-duty in a day
3. Cannot work more than 70 hours in 7 consecutive days or 120 hours in 14 consecutive days
4. In addition
   1. Under Cycle 1, no driving may be done after 70 on-duty hours in a 7-day cycle
   2. Under Cycle 2, no driving may be done after accumulating 120 on-duty hours in a 14-day cycle, and drivers cannot drive after accumulating 70 on-duty hours without taking 24 consecutive off-duty hours
   3. All drivers must take at least 24-consecutive hours of off-duty time in any 14-day period

## Time Allotment

* 6 total hours of work
* 1 hour of lunch
* 15 minutes for presentation each team, 5-minute Q &A, 5 minutes of setup

## Requirements of submission

* Programming languages are restricted to the following: Assembly, C, C++, Objective-C, C#, Java, Python, JavaScript, Python, Ruby, Perl, VHDL, Lisp, MatLab, Haskell, SQL, PHP, HTML.
* This is a GUI program that must run on Windows 10 X64
* All libraries needed to run the program must be provided
* If any public library reference is made and requires installation on the host machine, a request must be made to the host prior to its implementation
* The required data will be provided in both XML and JSON format
  + - Note: A different file will be used for judging under the same name and will NOT be the same size as the sample file.
* GUI should make use of the full screen
* **You must build a \*.exe, \*.jar or similar** that can run on **Windows 10 x64,** a **\*.ppt(x)** for the presentation, a **pdf user guide**, and provide **all source code**
* submit all files as a .zip (include all needed .dll or similar files)
* If you are using a web-based solution, a URL is an acceptable alternative. Please note no web server will be provided nor installed on the host machine. For any additional runtime requests for the above apps, please make a request **at a minimum of 1 hour before final submission** to have it available.

## Presentation Requirements

* Present all deliverables, including a demonstration of the solution
* All team members should be present and act in a professional manner
* Questions must be answered in a reasonable amount of time, priority will be giving to questions from judges
* Visual aids should be provided in the form of a power point
* You should explain how the solution works at a high-level

## Additional notes:

1. Additional information beyond the minimum that improves the solution is highly encouraged
2. .NET 6 latest runtime, Visual C++ 2015-2022 and the latest JRE are provided on the host machine
3. Your program must work without changing environment variables or system path.
4. Your code should be well documented and commented
5. Persistent data can be saved in any file format consistent with the competition rules

## Judging

* Judges will be provided the rubric and problem statement prior to the competition
* At the end of all presentations, scores will be announced in reverse order (last place to first place) by the head judge
* Teams will be provided with a copy of their rubric for use in developing their skills

## Scoring

Each team will be scored on the following rubric:

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| --- | --- |
| **Program Design / GUI** | **/50** |
| Does the program make good use of the screen size? | /5 |
| Is the interface user friendly when using mouse and keyboard? | /15 |
| Is the colour scheme visually appealing | /10 |
| Is there sufficient feedback that the app is working as intended, or in an error state? | /10 |
| Does the workflow of the program make sense? | /5 |
| Is the application responsive to user inputs? | /5 |

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| --- | --- |
| **Documentation**  Is there a sufficient user guide provided? | **/5** |

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| **Solution Performance** | **/20** |
| Does the Solution meet the minimum functional requirements? | /5 |
| Does the program monitor hours of service? | /5 |
| Is the program fast enough to be usable? | /5 |
| Flag correct start point for truck and driver? | /5 |

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| --- | --- |
| **Presentation** | **/25** |
| Was the presentation clear and understandable? | /5 |
| Was the code well explained? | /5 |
| Was the team professional? | /5 |
| Was team communication clear? (IE lacking technical jargon, a non-technical person should understand most of the presentation) | /5 |
| Was the presentation easy to follow? | /3 |
| Did the presentation have proper use of images, text and other visual aids? | /2 |

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| **Penalties / Bonuses** |  |
| Bugs | Number reported x -5 max -20  Number unreported x –25 max -50 |
| No GUI | -30 |
| Above and beyond features | +5 \* number of additional features, +10 max |

**TOTAL SCORE**  **/100**