

# ***CST2550 Software Engineering and Development Coursework 2 Report***

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In this report I would like to describe the entire process behind my execution of the second piece of Coursework for Software Engineering and Development module.

We were tasked with the creation of a working car park system with appropriate calculations regarding time spent in the parking lot. My project consists of “main.cpp” file which includes the whole main menu, “Vehicle.h” header file which describes the struct I use to create instances of cars entering the parking lot, as well as “Vehicle.cpp” file which contains my methods used for calculating the charge for parking.

In my project I have decided to go with struct instead of class, as in structs members are public by default, and I did not see a point in making it private. For objects storage, I have used vectors, which are not indexed based like arrays, they are more dynamic, they allow resizing, whereas arrays are fixed, and I think it would not be convenient to work with arrays while designing a parking system.

My struct "Vehicle" contains four data members which are constructed while reading file "FILE.txt" line by line while separating each line by the commas. The tricky part consisted of converting the strings with time-in and time-out to make them feasible for calculations. For this purpose, I have created methods "convertTimeInIntoSeconds()" and "convertTimeOutIntoSeconds()". Both methods work in similar ways, they split the time-in/time-out strings (which are in format hh:mm:ss) into three pieces, the hour part, the minutes' part and the second's part. Then all of these pieces are calculated to seconds and added together to get the total time spent in the parking lot in seconds. The last method "calculateCharge()" takes into account time spent in the parking lot and series of "if" statements are used to decide how much is the charge (as specified in the table below, given to us in the Coursework handout).

Duration	Price
less than 30 minutes	FREE
Up to 1 hour	£1.50
Up to 2 hours	£3.00
Up to 4 hours	£5.00
Up to 8 hours	£15.00
Over 8 hours	£30.00

The main method contains a menu made using switch cases. The first option allows user to input data, that data is then written to file and while reading the file each part of the lines separated by commas are set as objects' data members and the whole objects are pushed into the vector of objects. The second option utilizes functions to calculate the charge and displays all the vehicles (sorted by their vehicle registration number) as well the duration of the stay and total price for parking. Finally, the last option allows the user to exit the program.

For this project I have created an amateur parking management system. One of my main limitations was lack of time and knowledge that would allow me to construct a more complete and complex system. As I could understand how to write appropriate tests in Catch2, I failed to include any in my Coursework. For similar tasks in the future, I would learn how to run proper tests first and focus on the design part more, but what is more important, I would try and learn C++ concepts on daily basis to understand them better and to have a better understanding of how to implement them.

*Cay S. Horstmann (2005) "Big C++", San Jose State University*