

Project 1 – ERD and Report Design

The context of this problem is that a notional client, Harry Mackie, and his brothers Archie and Brian, have decided to open a small taxi stand (HAB Taxi Services – what a great name) in their town and asked for your help with the technology. All the brothers are mechanics so all maintenance will be performed in-house. They have a large garage between their homes (they are neighbors too) with a small build-out on the side that will be used as an office and command center. They have 4 cars that they are using in the business and rent out to drivers, while other employees use their own vehicles and pay stand fees.

A text file called Defaults.dat includes some values that will be used by the system. Values include the Next transaction number (143), the Next driver number (1922), the Monthly stand fee (\$175.00) for drivers with their own car, the Daily rental fee (\$60.00) and the Weekly rental fee (\$300.00) for drivers who rent one of the company cars, and the HST rate (15%).

To keep track of drivers, set up an Employees table to store their driver number, name, address and phone number, drivers license number and expiry date, insurance policy company and policy number, a field to represent if they have their own car, and a field for their balance due – based on stand fees and rentals. Note that Harry, Archie, and Brian will also be set up as employees in this table.

A table is required to record any revenues from the company in a Revenues table. This table will include a Transaction ID, the date of the transaction, a brief description of the transaction, the driver number that generated the revenue, the amount of the transaction, the HST and the Total. NOTE: On the first day of each month stand fees are automatically charged to the drivers when the program is turned on, the balance due is updated in the employee table, and the revenue will be recorded in the revenue table.

Another table is required to record company Expenses for supplies and repairs to the company cars in an Expenses table. This table will include an Invoice number, an invoice date, the driver number that generated the expense, the item number, description, Cost, the Quantity, and the item total (Cost * Quantity) – NOTE: there could be multiple items entered on the invoice. Finally, the Subtotal, the HST and the Total will be added.

As drivers rent one of the company cars, we need to record the information to a Rentals table. The table will include a Rental ID, the driver number, the start date of the rental, the car number (1, 2, 3, or 4), whether the rental is for a day (from noon to noon the next day) or a week, the number of days (if they pick a week, it will appear as 7), the rental cost, the HST and the total. NOTE: this will update the balance due in the employees table above and add a record to the Revenue table as well.

As a driver makes a payment on their balance due, record the information to a Payment table. This will include a Payment ID, the driver number, the date of the payment, the amount of the payment, the reason for the payment, and the payment method (Cash, Debit, or Visa).

Create an ER Diagram based on the case study presented. Add one other feature to the ERD. It could be some new fields, a new table, or a combination of both. Add a description of what you did at the end of your ERD.

Design each of the following Reports / Receipts that are generated by the system. Place each of the designs on separate pages (Use Ctrl + Enter to move to the next page) after the ERD.

- As a driver rents a company car or makes a payment on their balance, the system must print a receipt. Make sure it clearly indicates the reason for generating the receipt.

Payment Table (ERD)/ #5 in Python

- A Profit Listing is a report that is generated based on a Start and End Date – could be a single day, a month, or the entire year. Include all revenues and expenses and a calculated Profit (Loss) which is the total revenues less the total expenses.

Revenue & Expenses Table (ERD)/ #6 in Python

- A Driver Financial Listing can be generated for any driver based on a Start and End Date. It includes all entries from the Revenue table for the driver and dates specified. Include relevant totals at the end of the report.

Employee & Revenue Table (ERD)/ #7 in Python

Project 2 – Some Python Code – I know you LOVE this.

The program will be set up to work from the following **menu**. There are enough options that someone can set up the menu and everyone can take a part or two from the menu options.

HAB Taxi Services
Company Services System

1. Enter a New Employee (driver).
2. Enter Company Revenues.
3. Enter Company Expenses.
4. Track Car Rentals.
5. Record Employee Payment.
6. Print Company Profit Listing.
7. Print Driver Financial Listing.
8. Your report – add description here.
9. Quit Program.

Enter choice (1-9):

Create the **defaults file** as described in the case study. At the beginning of this program, read the values from the defaults file to proper variable. Write the values back at the end of the program.

Remember how I said programmers hate the word “Automatically”? On the first day of each month stand fees are automatically charged to the drivers with their own car when the program is turned on, and the revenue will be recorded in the revenue table. A sample record in the revenue table would appear as follows. It was mentioned that this would also update the balance due in the employees table – Place a comment indicating that the Balance Due would be updated now – this update does not need to be coded – it is quite tricky with text files – BONUS mark if you can figure it out.

143, 2022-04-01, Monthly Stand Fees, 1918, 175.00, 26.25, 201.25

From the menu, complete the code for **Option 1, OR 2, OR 3** – Did you notice the word **OR** - just one is required to be coded. Based on your ERD, design, and code a text-based interface. Add some calculated fields and display the results once the inputs are complete and write the values to the appropriate files.

The data files for Options 1, 2 and 3 (including the option from the previous step) should be created. Just create the data files for the other options not created in the previous step. Add up to 5 - 6 records in the Employee table, and 10 - 20 records in the revenue and expenses tables.

Write the code for **Options 6 OR 7** based on the designs you created in the first project. At the end of the report, **create some analytics data** that can be used for decision making.

Design one other report based on the information in the ERD that you feel would be useful. This is to be added as option 8 in the menu.