* **SQL query**

Suppose you have two tables, Employee and Salary, that have a common key, emp\_id.

The Employee table has records with a start date and end date which indicates when an employee joined the company and left.

|  |  |  |  |
| --- | --- | --- | --- |
| **emp\_id** | **emp\_name** | **start\_date** | **end\_date** |
| 1001 | Alice | 2010-01-01 | 2012-12-31 |
| 1002 | Bob | 2009-05-15 | 2010-09-01 |
| 1003 | Charlie | 2010-07-01 | NULL |
| 1004 | David | 2010-07-01 | 2010-09-01 |

The Salary table has records of their daily\_rate with a start date which indicate the first day when an employee received a certain salary.

|  |  |  |
| --- | --- | --- |
| **emp\_id** | **daily\_rate** | **start\_date** |
| 1001 | 50.00 | 2010-01-01 |
| 1002 | 60.00 | 2009-05-15 |
| 1002 | 70.00 | 2010-06-01 |
| 1003 | 70.00 | 2010-01-01 |
| 1004 | 80.00 | 2010-07-01 |

1. Write a SQL query to find out Bob's daily rate on 15/06/2010

2. Write a SQL query to find everyone’s daily rate for 10/10/2010

3. Optional question: Write a SQL query to find the daily spend for all employees in 2010

* **Battery revenue calculation**

Across the NEM, energy dispatches are transacted every 5 minute interval. A battery can both charge and discharge energy into the grid in each interval. For the purposes of this exercise, assume that batteries have linear ramping capabilities between the MW that measured in the beginning of each interval.

The discharge revenue for an asset during a given 5 min trading interval can be calculated as follows, for example:

Let the power output of the battery unit measured at the beginning of the period be 24MW (INITIALMW) and the output at the end of the period (use INITIALMW at the beginning of the next period) be 48MW.

The spot energy price (RRP) for this interval is $100/MWh.

So, the energy dispatched within the interval is then calculated as 3MWh and the revenue is 3MWh \* $100/MWh = $300

The timestamp (interval period end time), INITIALMW, TARGETMW (the dispatch MW expected at the end of the interval) and RRP (energy price) for each interval are provided via csv file. If the INITIALMW from the next period is not available, use the TARGETMW value. If MW value is negative, means the battery is charging. The battery can change from charge to discharge in the same interval.

Find the net energy revenue (discharge revenue less charge cost) for the date 2024-04-01. We expect to see

1. An executable python script.
2. The result revenue number
3. Please include any steps needed to run the code, and any notes to help understanding the methodology / approach / assumptions.
4. Optional question: how should we measure the performance of the battery energy trading?