# Exercises

Your Name: STEPHEN OMONDI  
Your SUID: 946934043  
Your Email: SOOMONDI@SYR.EDU  
Date Due: 10/27/2019  
Homework #: LABWORK 4

Complete each of the following exercises. If you are unsure how to accomplish the task, please consult the coursework videos where there are explanations and demos. Where appropriate use the live query statistics feature to verify your query uses the index as directed.

1. Create a non-clustered index on the **timesheets** table in the **demo** database. The index you create should be designed to improve the following query:

---which table to use?--

USE fudgemart\_v3

--creating required data set--

DROP TABLE IF EXISTS timesheets;

GO

SELECT \* INTO timesheets

FROM fudgemart\_employees

JOIN fudgemart\_employee\_timesheets

ON employee\_id = timesheet\_employee\_id;

----initial query to be improved by an index --

SELECT employee\_id,

employee\_firstname,

employee\_lastname,

SUM(timesheet\_hourlyrate\*timesheet\_hours) AS Earnings

FROM timesheets

GROUP BY employee\_id, employee\_firstname, employee\_lastname;

---nonclustered index --

DROP INDEX IF EXISTS ix\_employees\_timesheet ON timesheets

GO

CREATE NONCLUSTERED INDEX ix\_employees\_timesheet

ON timesheets(employee\_lastname)

INCLUDE (employee\_firstname, timesheet\_hourlyrate, timesheet\_hours)

GO

1. Write an SQL Select query which uses the index you created in the first question but does an index seek instead of an index scan.

---Querry using index seek (employee\_lastname)--

SELECT employee\_firstname, SUM(timesheet\_hourlyrate \* timesheet\_hours) AS Earnings

FROM timesheets

WHERE employee\_lastname = 'Ladd'

GROUP BY employee\_firstname

GO

1. Create a single columnstore index on the **timesheets** table in the **demo** database which will improve the following queries:

--\\\\\\QUESTION #3 PART A\\\\\\\---

---query to improve---

SELECT employee\_department, SUM(timesheet\_hours) AS Earnings

FROM timesheets

GROUP BY employee\_department;

GO

--improving single columnstore index---

DROP INDEX IF EXISTS ix\_timesheet\_dept ON timesheets;

GO

CREATE NONCLUSTERED COLUMNSTORE INDEX ix\_timesheet\_dept

ON timesheets(employee\_department)

GO

--calling the columstore index scan

SELECT SUM(timesheet\_hours) AS total\_hours

FROM timesheets

WHERE employee\_department = 'Clothing';

--\\\\\\QUESTION #3 PART B\\\\\\\---

--query to improve---

SELECT employee\_jobtitle, AVG(timesheet\_hourlyrate) AS Hourly\_Rate

FROM timesheets

GROUP BY employee\_jobtitle;

GO

--selecting with single columnstore seek--

SELECT AVG(timesheet\_hourlyrate) AS total\_hours

FROM timesheets

WHERE employee\_jobtitle = 'CEO';

GO

1. Create an indexed view named **v\_employees** on the **timesheets** table in the **demo** database which lists the employee id, first name, last name, job title, and department columns values and one row per employee (essentially re-building the employee table). Then set a unique clustered index on the view and finish by writing an SQL Select query which uses the indexed view.

--\\\\\\QUESTION #4\\\\\\\---

DROP VIEW IF EXISTS v\_employees;

GO

---the view--

CREATE VIEW v\_employees

--WITH SCHEMABINDING

AS

SELECT DISTINCT employee\_id, employee\_firstname, employee\_lastname, employee\_jobtitle, employee\_department

FROM timesheets

GO

---index on the view---

DROP INDEX IF EXISTS ix\_unique\_employees ON timesheets

GO

CREATE UNIQUE CLUSTERED INDEX ix\_unique\_employees

ON timesheets(employee\_id, employee\_firstname, employee\_lastname, employee\_jobtitle, employee\_department)

GO

1. Output the following query in JSON format: Display the employee id, first name, last name, count of timesheets, total hours worked, and average timesheet hourly rate.

--the table---

SELECT employee\_id,

employee\_firstname,

employee\_lastname,

timesheet\_hours,

employee\_hourlywage \* timesheet\_hours AS Earnings,

employee\_hourlywage AS Avg\_hourly\_rate

FROM timesheets

FOR JSON AUTO;

GO