

Individual Project 4
DS160-01
Introduction to Data Science
Spring 2022

Writing SQL Queries(50 points)

Goal: The goal of this project is to provide you practice for writing simple SQL queries.

Instructions: Create a new .sql file titled **IP4_XXX.sql**, where **XXX** are your initials; and rename this file to **IP4_XXX.docx**. Also create a GitHub repository titled **IP4_XXX** to which you can push both your .sql file and this document.

Attached to the assignment are two .sql files. HenryBooksCreate.sql which will create the database on you MySQL server and HenryBooksFill.sql which will fill it with data.

You will form the following queries for the Henry Books database and provide the statement and the output in this document. All of your SQL statements should also be in the .sql file. Use a comment (# mark) in your .sql file to number the statements according to this document. Each problem is marked with its point worth.

1. Retrieve the first name and last name of each author in the author relation. Order does not matter. **(1 points)**

SQL Statement:

```
SELECT firstName as "First Name", lastName as "Last Name"  
FROM author;
```

Output:

First Name	Last Name
Toni	Morrison
Paul	Solotaroff
Vernor	Vintage
Dick	Francis
Peter	Straub
Stephen	King
Phillip	Pratt
Truddi	Chase
Bradley	Collins
Joseph	Heller
Gary	Wills
Douglas R.	Hofstadter
Harper	Lee
Stephen E.	Ambrose
J.K.	Rowling
J.D.	Salinger
Seamus	Heaney
Albert	Camus
Bradley	Collins, Jr.
John	Steinbeck
Riva	Castelman
Barbra	Owen
Randy	O'Rourke
Tracy	Kidder
Lon	Schleining

2. Retrieve the title and book type in the book relation. Order does not matter. **(1 points)**

SQL Statement:

```
SELECT title as "Book Title", TYPE as "Book Type"  
FROM book;
```

Output:

Book Title	Book Type
A Deepness in the Sky	SFI
Magic Terror	HOR
The Stranger	FIC
Venice	ART
Second Wind	MYS
The Edge	MYS
Dreamcatcher: A Novel	HOR
Treasure Chests	ART
Beloved	FIC
Harry Potter and the Prisoner of Azkaban	SFI
Von Gogh and Gaugin	ART
Of Mice and Men	FIC
Electric Light	POE
Group: Six People in Search of a Life	PSY
Nine Stories	FIC
The Soul of a New Machine	SCI
Travel with Charley	TRA
Catch-22	FIC
Jazz	FIC
Band of Brothers	HIS
A Guide to SQL	CMP
Franny and Zooey	FIC
East of Eden	FIC
Harry Potter and the Goblet of Fire	SFI
The Fall	FIC
Godel, Escher, Bach	PHI
When Rabbit Howls	PSY
Black House	HOR
Song of Solomon	FIC
The Grapes of Wrath	FIC
Slay Ride	MYS
The Cather in the Rye	FIC
To Kill a Mockingbird	FIC

3. Retrieve the publisherCode in the book relation. List each publisherCode only once in the result. Order does not matter. **(1 points)**

SQL Statement:

```
SELECT publisherCode as "Publisher Code"  
FROM book  
GROUP BY publisherCode;
```

Output:

Publisher Code
BA
BP
BY
CT
FA
FS
HC
JP
LB
PE
PL
PU
RH
SC
SS
ST
TA
TB
TO
VB
WP

4. Retrieve the title and price of each book in the book relation. Further add a calculated column named 'discount' that shows the price the book with 25% discount. Order does not matter. Show the first five rows of the result **(LIMIT 5). (3 points)**

SQL Statement:

```
SELECT title, price, ROUND(((1-0.25)*price), 2) as discount  
FROM book  
LIMIT 5;
```

Output:

title	price	discount
A Deepness in the Sky	7.19	5.39
Magic Terror	7.99	5.99
The Stranger	8.00	6.00
Venice	25.40	18.38
Second Wind	25.95	18.71

5. Retrieve the title and price for any book whose price is higher than \$20.00 in the book relation. Show the full result. **(3 points)**

SQL Statement:

```
SELECT title, price
FROM book
WHERE price > 20.00;
```

Output:

title	price
Venice	24.50
Second Wind	24.95
Treasure Chests	24.46
Van Gogh and Gauguin	21.00
A Guide to SQL	37.95

6. Retrieve the publisherName of all publishers that are in New York only in the publisher relation. Order does not matter. **(2 points)**

SQL Statement:

```
SELECT publisherName as "Publisher Name"
FROM publisher
WHERE city = "New York";
```

Output:

Publisher Name
Arcade Publishing
Back Bay books
Fawcett books
Farrar Strauss and Giroux
HarperCollins publishers
Jove Publications
Lb books
Penguin USA
Plume
Putnam Publishing Group
Random House
Schoken books
Scribner
Simon and Schuster
SchoLASTic Trade
Tor books
Thames and Hudson
Vintage books
W.W. Norton

7. Retrieve the publisherName of all publishers that are not in New York in the publisher relation. (use != for inequality). Order does not matter. Show the full result. **(3 points)**

SQL Statement:

```
SELECT publisherName as "Publisher Name"  
FROM publisher  
WHERE city != "New York";
```

Output:

Publisher Name
Arkham House
Basic books
Berkley Publishing
Course Technology
Jeremy P. Tarcher
McPherson and Co.
Taunton Press
Touchstone books
Westview Press

8. Retrieve the bookCode and onHand for each book for which a branch has between 2 and 4 copies in the inventory relation. Use the **BETWEEN** keyword in this query. Order does not matter. Show the full result. (3 points)

SQL Statement:

```
SELECT bookCode as "Book Code", onHand as "Number on hand", branchNum as "Branch Number"  
FROM inventory  
WHERE onHand BETWEEN 2 AND 4;
```

Output:

Book Code	Number on hand	Branch Number
0180	2	1
0189	2	2
0200	3	2
0378	2	3
079X	2	3
079X	3	4
1351	4	2
1351	2	3
138X	3	2
2226	3	1
2226	2	3
2281	3	4
2766	2	3
2908	3	1
3350	2	1
3906	2	3
5790	2	4
6128	4	2
6128	3	3
6328	2	2
6908	2	2
7405	2	3
7559	2	2
8720	3	1
9611	2	1
9627	2	4
9701	2	1
9701	3	3
9701	2	4
9882	3	3
9883	3	2
9883	2	4
9931	2	1

9. Retrieve a count of the number of books published by Penguin USA. Name the column 'Penguin Books'. Order does not matter. Show your full result. **(3 points)**

SQL Statement:

```
SELECT count(title) as "Penguin Books"
FROM publisher, book
WHERE publisherName = "Penguin USA" AND (publisher.publisherCode = book.publisherCode)
GROUP BY publisherName;
```

Output:

Penguin Books
4

10. Retrieve the number of books in the book relation whose prices is \$20.00 or lower. Order does not matter. Show your full result. **(3 points)**

SQL Statement:

```
SELECT count(title) as "Number of Books Priced $20.00 and Under"
FROM book
WHERE price <= 20.00;
```

Output:

Number of Books Priced Under \$20.00
28

11. Retrieve all of the columns from the book and publisher relations in one result. Use aliases in your query and use the simple JOIN syntax (WHERE clause). Order does not matter. **(5 points)**

SQL Statement:

```
SELECT bookCode as "Book Code", title as "Book Title", TYPE as "Type of Book", price as "Price", paperback as
"Paperback", book.publisherCode as "Publisher Code", publisherName "Publisher Name", city as "Publisher City"
FROM book
JOIN publisher
WHERE book.publisherCode = publisher.publisherCode;
```

Output:

Book Code	Book Title	Book Type	Book Price	Paperback Book	Publisher Code	Publisher Name	Publisher City
0180	A Deepness in the Sky	SFI	7.19	Y	TB	Tor Books	New York
0189	Magic Terror	HOR	7.99	Y	FA	Fawcett Books	New York
0200	The Stranger	FIC	8.00	Y	VB	Vintage Books	New York
0378	Venice	ART	24.50	N	SS	Simon and Schuster	New York
079X	Second Wind	MYS	24.95	N	PU	Putnam Publishing Group	New York
0808	The Edge	MYS	6.99	Y	JP	Jove Publications	New York
1351	Dreamcatcher: A Novel	HOR	19.60	N	SC	Scribner	New York
1382	Treasure Chests	ART	24.46	N	TA	Taunton Press	Newtown CT
138X	Beloved	FIC	12.95	Y	PL	Plume	New York
2226	Harry Potter and the Prisoner of Azkaban	SFI	13.96	N	ST	SchoLASTic Trade	New York
2281	Van Gogh and Gauguin	ART	21.00	N	WP	Westview Press	Boulder CO
2766	Of Mice and Men	FIC	6.95	Y	PE	Penguin USA	New York
2908	Electric Light	POE	14.00	N	FS	Farrar Straus and Giroux	New York
3350	Group: Six People in Search of a Life	PSY	10.40	Y	BP	Berkley Publishing	Boston
3743	Nine Stories	FIC	5.99	Y	LB	Lb books	New York
3906	The Soul of a New Machine	SCI	11.16	Y	BY	Back Bay books	New York
5163	Travels with Charley	TRA	7.95	Y	PE	Penguin USA	New York
5790	Catch-22	FIC	12.00	Y	SC	Scribner	New York
6128	Jazz	FIC	12.95	Y	PL	Plume	New York
6328	Band of Brothers	HIS	9.60	Y	TO	Touchstone Books	Westport CT
669X	A Guide to SQL	CMP	37.95	Y	CT	Course Technology	Boston
6908	Franny and Zooey	FIC	5.99	Y	LB	Lb books	New York
7405	East of Eden	FIC	12.95	Y	PE	Penguin USA	New York
7443	Harry Potter and the Goblet of Fire	SFI	18.16	N	ST	SchoLASTic Trade	New York
7559	The Fall	FIC	8.00	Y	VB	Vintage Books	New York
8092	Godel, Escher, Bach	PHI	14.00	Y	BA	Basic books	Boulder CO
8720	When Rabbit Howls	PSY	6.29	Y	JP	Jove Publications	New York
9611	Black House	HOR	18.81	N	RH	Random House	New York
9627	Song of Solomon	FIC	14.00	Y	PL	Plume	New York
9701	The Grapes of Wrath	FIC	13.00	Y	PE	Penguin USA	New York
9882	Slay Ride	MYS	6.99	Y	JP	Jove Publications	New York
9883	The Catcher in the Rye	FIC	5.99	Y	LB	Lb books	New York
9931	To Kill a Mockingbird	FIC	18.00	N	HC	HarperCollins publishers	New York

12. Rewrite the previous query using the ON keyword. (5 points)

SQL Statement:

```
SELECT bookCode as "Book Code", title as "Book Title", TYPE as "Type of Book", price as "Price", paperback as
"Paperback", book.publisherCode as "Publisher Code", publisherName "Publisher Name", city as "Publisher City"
FROM book
JOIN publisher ON
book.publisherCode = publisher.publisherCode;
```

Output:

Book Code	Book Title	Book Type	Book Price	Paperback Book	Publisher Code	Publisher Name	Publisher City
0180	A Deepness in the Sky	SFI	7.19	Y	TB	Tor Books	New York
0189	Magic Terror	HOR	7.99	Y	FA	Fawcett Books	New York
0200	The Stranger	FIC	8.00	Y	VB	Vintage Books	New York
0378	Venice	ART	24.50	N	SS	Simon and Schuster	New York
079X	Second Wind	MYS	24.95	N	PU	Putnam Publishing Group	New York
0808	The Edge	MYS	6.99	Y	JP	Jove Publications	New York
1351	Dreamcatcher: A Novel	HOR	19.60	N	SC	Scribner	New York
1382	Treasure Chests	ART	24.46	N	TA	Taunton Press	Newtown CT
138X	Beloved	FIC	12.95	Y	PL	Plume	New York
2226	Harry Potter and the Prisoner of Azkaban	SFI	13.96	N	ST	SchoLASTic Trade	New York
2281	Van Gogh and Gauguin	ART	21.00	N	WP	Westview Press	Boulder CO
2766	Of Mice and Men	FIC	6.95	Y	PE	Penguin USA	New York
2908	Electric Light	POE	14.00	N	FS	Farrar Straus and Giroux	New York
3350	Group: Six People in Search of a Life	PSY	10.40	Y	BP	Berkley Publishing	Boston
3743	Nine Stories	FIC	5.99	Y	LB	Lb books	New York
3906	The Soul of a New Machine	SCI	11.16	Y	BY	Back Bay books	New York
5163	Travels with Charley	TRA	7.95	Y	PE	Penguin USA	New York
5790	Catch-22	FIC	12.00	Y	SC	Scribner	New York
6128	Jazz	FIC	12.95	Y	PL	Plume	New York
6328	Band of Brothers	HIS	9.60	Y	TO	Touchstone Books	Westport CT
669X	A Guide to SQL	CMP	37.95	Y	CT	Course Technology	Boston
6908	Franny and Zooey	FIC	5.99	Y	LB	Lb books	New York
7405	East of Eden	FIC	12.95	Y	PE	Penguin USA	New York
7443	Harry Potter and the Goblet of Fire	SFI	18.16	N	ST	SchoLASTic Trade	New York
7559	The Fall	FIC	8.00	Y	VB	Vintage Books	New York
8092	Godel, Escher, Bach	PHI	14.00	Y	BA	Basic books	Boulder CO
8720	When Rabbit Howls	PSY	6.29	Y	JP	Jove Publications	New York
9611	Black House	HOR	18.81	N	RH	Random House	New York
9627	Song of Solomon	FIC	14.00	Y	PL	Plume	New York
9701	The Grapes of Wrath	FIC	13.00	Y	PE	Penguin USA	New York
9882	Slay Ride	MYS	6.99	Y	JP	Jove Publications	New York
9883	The Catcher in the Rye	FIC	5.99	Y	LB	Lb books	New York
9931	To Kill a Mockingbird	FIC	18.00	N	HC	HarperCollins publishers	New York

13. Retrieve the title from the book relation and the city from the publisher relation using a JOIN query. Use aliases in your query. Order the result by title. (5 points)

SQL Statement:

```
SELECT title AS "Book Title", city as "Publication City"
FROM book
JOIN publisher ON
book.publisherCode = publisher.publisherCode
ORDER BY title;
```

Output:

Book Title	Publication City
A Deepness in the Sky	New York
A Guide to SQL	Boston
Band of Brothers	Westport CT
Beloved	New York
Black House	New York
Catch-22	New York
Dreamcatcher: A Novel	New York
East of Eden	New York
Electric Light	New York
Franny and Zooey	New York
Godel, Eschar, Bach	Boulder CO
Group: Six People in Search of a Life	Boston
Harry Potter and the Goblet of Fire	New York
Harry Potter and the Prisoner of Azkaban	New York
Jazz	New York
Magic Terror	New York
Nine Stories	New York
Of Mice and Men	New York
Second Wind	New York
Slay Ride	New York
Song of Solomon	New York
The Catcher of the Rye	New York
The Edge	New York
The Fall	New York
The Grapes of Wrath	New York
The Soul of a New Machine	New York
The Stranger	New York
To Kill a Mockingbird	New York
Travels with Charley	New York
Treasure Chests	Newtown CT
Van Gogh and Gaugin	Boulder CO
Venice	New York
When Rabbit Howls	New York

14. Retrieve the title from the book relation and branchNum and onHand from the inventory relation. Use aliases in your query. Order the result by title. **(5 points)**

SQL Statement:

```
SELECT title AS "Book Title", branchNum AS "Branch Number", onHand AS "Onhand Inventory"
FROM book
JOIN inventory ON
book.bookCode = inventory.bookCode
ORDER BY title;
```

Output:

Book Title	Branch Number	Onhand Inventory
A Deepness in the Sky	1	2
A Guide to SQL	1	1
Band of Brothers	2	2
Beloved	2	3
Black House	1	2
Catch-22	4	2
Dreamcatcher: A Novel	2	4
Dreamcatcher: A Novel	3	2
East of Eden	3	2
Electric Light	1	3
Electric Light	4	1
Franny and Zooey	2	2
Godel, Escher, Bach	3	1
Group: Six People in Search of a Life	1	2
Harry Potter and the Goblet of Fire	4	1
Harry Potter and the Prisoner of Azkaban	1	3
Harry Potter and the Prisoner of Azkaban	3	2
Harry Potter and the Prisoner of Azkaban	4	1
Jazz	2	4
Jazz	3	3
Magic Terror	2	2
Nine Stories	2	1
Of Mice and Men	3	2
Second Wind	2	1
Second Wind	3	2
Second Wind	4	3
Slay Ride	3	3
Song of Solomon	3	5
Song of Solomon	4	2
The Catcher in the Rye	2	3
The Catcher in the Rye	4	2
The Edge	2	1
The Fall	2	2
The Grapes of Wrath	1	2
The Grapes of Wrath	2	1
The Grapes of Wrath	3	3
The Grapes of Wrath	4	2
The Soul of a New Machine	2	1
The Soul of a New Machine	3	2
The Stranger	1	1
The Stranger	2	3
To Kill a Mockingbird	1	2
Travels with Charley	1	1
Treasure Chests	2	1
Van Gogh and Gauguin	4	3
Venice	3	2
When Rabbit Howls	1	3

15. Retrieve the title from the book relation and compute the number of copies of the title that all branches have on hand. Name this computed column 'Inventory' **Hint: You will need to join book and inventory and do an aggregate query.** Use aliases in your query. Order the result by the total number of copies of the book in descending order. Show the first two rows of your result. **(5 points)**

SQL Statement:

```
SELECT title AS "Book Title", SUM(onHand) as "Inventory"  
FROM book  
JOIN inventory ON  
book.bookCode = inventory.bookCode  
GROUP BY title  
ORDER by Inventory DESC  
LIMIT 2;
```

Output:

Book Title	Inventory
The Grapes of Wrath	8
Song of Solomon	7

16. Retrieve the first name and last name from the author relation and the title from the book relation for all paperback books in the book relation. Order the result by the author last name and title. **(5 points)**

SQL Statement:

```
SELECT firstName as "First Name", lastName as "Last Name", title as "Book Title"
FROM author
JOIN wrote ON
author.authorNUM = wrote.authorNum
JOIN book ON
wrote.bookCode = book.bookCode
WHERE paperback="Y"
ORDER BY lastName, title;
```

Output:

First Name	Last Name	Book Title
Stephen E.	Ambrose	Band of Brothers
Albert	Camus	The Fall
Albert	Camus	The Stranger
Truddi	Chase	When Rabbit Howls
Dick	Francis	Slay Ride
Dick	Francis	The Edge
Joseph	Heller	Catch-22
Douglas R.	Hofstadter	Godel, Escher, Bach
Tracy	Kidder	The Soul of a New Machine
Toni	Morrison	Beloved
Toni	Morrison	Jazz
Toni	Morrison	Song of Solomon
Philip	Pratt	A Guide to SQL
J.D.	Salinger	Franny and Zooey
J.D.	Salinger	Nine Stories
J.D.	Salinger	The Catcher in the Rye
Paul	Solotaroff	Group: Six People in Search of a Life
John	Steinbeck	East of Eden
John	Steinbeck	Of Mice and Men
John	Steinbeck	The Grapes of Wrath
John	Steinbeck	Travels with Charle
Peter	Straub	Magic Terror
Vernor	Vintage	A Deepness in the Sky

BONUS (5 points):

Retrieve the title from the book relation and the author lastName from the author relation. Order by author lastName. Use aliases in your query. **This will involve JOINING the book, author and wrote relations. (5 points)**

SQL Statement:

```
SELECT title as "Book Title", lastName as "Author Last Name"
FROM book
JOIN wrote ON
book.bookCode = wrote.bookCode
JOIN author ON
wrote.authorNum = author.authorNum
ORDER BY lastName;
```

Output:

Book Title	Author Last Name
Band of Brothers	Ambrose
The Stranger	Camus
The Fall	Camus
When Rabbit Howls	Chase
Van Gogh and Gauguin	Collins
Van Gogh and Gauguin	Collins, Jr.
Slay Ride	Francis
Second Wind	Francis
The Edge	Francis
Electric Light	Heaney
Catch-22	Heller
Godel, Escher, Bach	Hofstadter
The Soul of a New Machine	Kidder
Dreamcatcher: A Novel	King
Black House	King
To Kill a Mockingbird	Lee
Beloved	Morrison
Song of Solomon	Morrison
Jazz	Morrison
Treasure Chests	O'Rourke
A Guide to SQL	Pratt
Harry Potter and the Prisoner of Azkaban	Rowling
Harry Potter and the Goblet of Fire	Rowling
The Catcher in the Rye	Salinger
Nine Stories	Salinger
Franny and Zooey	Salinger
Treasure Chests	Schleining
Group: Six People in Search of a Life	Solotaroff
East of Eden	Steinbeck
Travels with Charley	Steinbeck
Of Mice and Men	Steinbeck
The Grapes of Wrath	Steinbeck
Black House	Straub
Magic Terror	Straub
A Deepness in the Sky	Vintage
Venice	Wills