

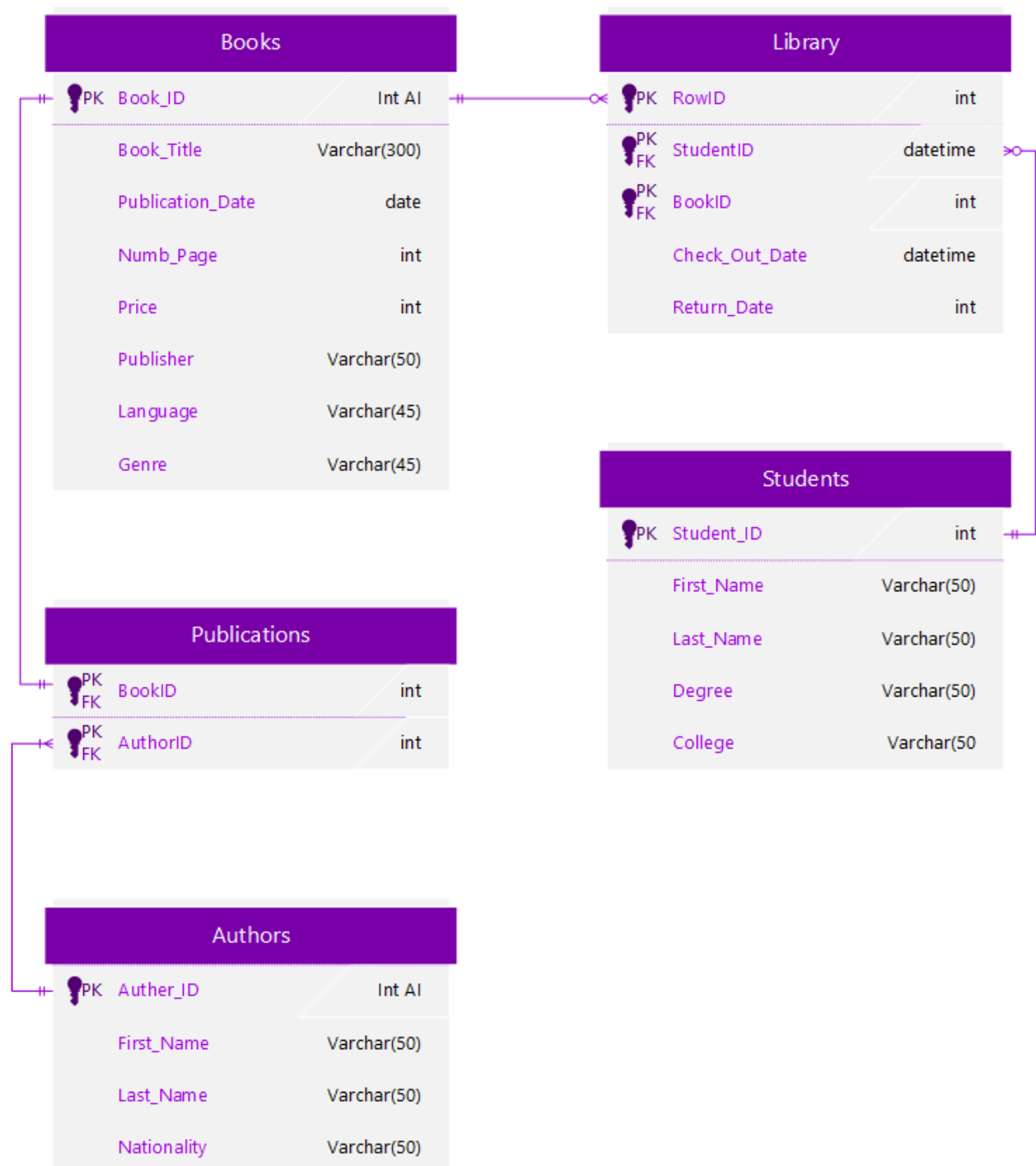
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Assignment 1: Course Management Database

6/29/2023

Question 1 – ER Diagram

Library ER Diagram



Question 2 – Keys

- Author table
 - Primary key: Author_ID
 - Foreign key: none
- Book table
 - Primary key: Book_ID
 - Foreign key: none
- Book_Author table
 - Primary key: Book_ID + Author_ID
 - Foreign key: Book_ID and Author_ID
- Book_Student table
 - Primary key: Book_ID + Student_ID + Row_ID
 - Foreign key: Book_ID and Student_ID
- Student table
 - Primary key: Student_ID
 - Foreign key: none

Question 3 – Normalization

The current design of the database is in third normal form because there are no repeating values in a single row, each non-key attribute is fully functionally dependent on the primary key(s), and there are no transitive dependencies between columns.

Question 4 – Data type of columns

Query 1 x SQL File 4* assignment1*

Limit to 1000 rows

```
1 • DESCRIBE author;  
2 • DESCRIBE book;  
3 • DESCRIBE book_author;  
4 • DESCRIBE book_student;  
5 • DESCRIBE student;  
6  
7
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: |

Field	Type	Null	Key	Default	Extra
Author_ID	int	NO	PRI	NULL	auto_increment
First_Name	varchar(50)	YES		NULL	
Last_Name	varchar(50)	YES		NULL	
Nationality	varchar(50)	YES		NULL	

Result Grid
Form Editor

Query 1 x SQL File 4* assignment1*

Limit to 1000 rows

```
1 • DESCRIBE author;  
2 • DESCRIBE book;  
3 • DESCRIBE book_author;  
4 • DESCRIBE book_student;  
5 • DESCRIBE student;  
6  
7
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: |

Field	Type	Null	Key	Default	Extra
Book_ID	int	NO	PRI	NULL	auto_increment
Book_Title	varchar(300)	YES		NULL	
Publication_Date	date	YES		NULL	
Numb_Page	int	YES		NULL	
Price	int	YES		NULL	
Publisher	varchar(50)	YES		NULL	
Language	varchar(45)	YES		NULL	
Genre	varchar(45)	YES		NULL	

Result Grid
Form Editor
Field

Query 1 x SQL File 4* assignment1*

Limit to 1000 rows

```

1 • DESCRIBE author;
2 • DESCRIBE book;
3 • DESCRIBE book_author;
4 • DESCRIBE book_student;
5 • DESCRIBE student;
6
7

```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: |

Field	Type	Null	Key	Default	Extra
BookID	int	NO	PRI	NULL	
AuthorID	int	NO	PRI	NULL	

Result Grid

Query 1 x SQL File 4* assignment1*

Limit to 1000 rows

```

1 • DESCRIBE author;
2 • DESCRIBE book;
3 • DESCRIBE book_author;
4 • DESCRIBE book_student;
5 • DESCRIBE student;
6
7

```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: |

Field	Type	Null	Key	Default	Extra
BookID	int	NO	PRI	NULL	
StudentID	int	NO	PRI	NULL	
Check_Out_Date	datetime	YES		NULL	
Return_Date	datetime	YES		NULL	
RowID	int	NO	PRI	NULL	

Result Grid

Form Editor

Query 1 x SQL File 4* assignment1*

Limit to 1000 rows

```

1 • DESCRIBE author;
2 • DESCRIBE book;
3 • DESCRIBE book_author;
4 • DESCRIBE book_student;
5 • DESCRIBE student;
6
7

```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: |

Field	Type	Null	Key	Default	Extra
Student_ID	int	NO	PRI	NULL	auto_increment
First_Name	varchar(50)	YES		NULL	
Last_Name	varchar(50)	YES		NULL	
Degree	varchar(50)	YES		NULL	
College	varchar(50)	YES		NULL	

Result Grid

Form Editor

Question 5 – Author names

1 • `SELECT First_Name, Last_Name FROM author;`

Result Grid | Filter Rows: | Export: | Wrap Cell Content: |

	First_Name	Last_Name
▶	J.K.	Rowling
	W.	Frederick
	Douglas	Adams
	Bill	Bryson
	J.R.R.	Tolkien
	Chris	nat
	Jude	Fisher
	Dave	Thomas
	Gary	Paulsen
	Donna	Ickes
	Molly	Hatchet
	Dale	Peck
	Angela	Knight
	Delia	Sherman
	Patricia	A.
	Zilpha	Keatley
	Kate	Horsley
	Philippa	Carr
	Edward	P.
	Satyajit	Das
	Mark	Smylie
	John	McPhee
	Wendy	Wasserstein
	Heidi	Hayes
	Heidi	Boyd
	Heidi	Baker

author 1 x

Result Grid
Form Editor
Field Types
Query Stats
Execution Plan
Read Only

Question 6 – Novels

Describe Tables Select all from tables Question 5 Question 6*

Limit to 1000 rows

```

1 • SELECT * FROM book
2   WHERE Genre = 'Novel';

```

Result Grid Filter Rows: Edit: Export/Import: Wrap Cell Content: IA

Book_ID	Book_Title	Publication_Date	Numb_Page	Price	Publisher	Language	Genre
1	Harry Potter and the Half-Blood Prince (Harry P...	2006-09-16	652	978	Scholastic Inc.	eng	Novel
2	Harry Potter and the Order of the Phoenix (Har...	2004-09-01	870	1305	Scholastic Inc.	eng	Novel
3	Harry Potter and the Chamber of Secrets (Harr...	2003-11-01	352	528	Scholastic	eng	Novel
4	Harry Potter and the Prisoner of Azkaban (Harr...	2004-05-01	435	653	Scholastic Inc.	eng	Novel
5	Harry Potter Boxed Set Books 1-5 (Harry Potte...	2004-09-13	2690	4035	Scholastic	eng	Novel
6	Unauthorized Harry Potter Book Seven News: "...	2005-04-26	152	228	Nimble Books	en-US	Novel
7	Harry Potter Collection (Harry Potter #1-6)	2005-09-12	3342	5013	Scholastic	eng	Novel
35	Outsider, The	2005-07-28	198	257	Penguin	en	Novel
36	Complete Sherlock Holmes, The - Vol I	2000-04-01	176	229	Random House	en	Novel
37	Complete Sherlock Holmes, The - Vol II	1994-08-28	176	229	Random House	en	Novel
38	Wealth of Nations, The	2001-01-23	175	228	Random House	en	Novel
39	Pillars of the Earth, The	2003-06-10	176	229	Random House	en	Novel
101	The Lord of the Rings (The Lord of the Rings #...	2004-10-21	1184	1776	Houghton Miff...	eng	Novel
102	The Fellowship of the Ring (The Lord of the Rin...	2003-09-05	398	597	Houghton Miff...	eng	Novel
103	The Lord of the Rings (The Lord of the Rings #...	2002-10-01	1216	1824	Houghton Miff...	en-US	Novel
104	The Lord of the Rings: Weapons and Warfare	2003-11-05	218	327	Houghton Miff...	eng	Novel
105	The Lord of the Rings: Complete Visual Companion	2004-11-15	224	336	Houghton Miff...	eng	Novel
109	Guts: The True Stories behind Hatchet and the ...	2001-01-23	144	216	Delacorte Press	eng	Novel
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

book 1 x Apply Revert

Result Grid Form Editor Field Types Query Stats Execution Plan

Question 7 – Books published between 2000 and 2005

Describe Tables Select all from tables Question 5 Question 6* Question 7* x

Limit to 1000 rows

```

1 • SELECT * FROM book
2 WHERE Publication_Date BETWEEN '2000-01-01' AND '2005-12-31'

```

Result Grid Filter Rows: Edit: Export/Import: Wrap Cell Content: Result Grid Form Editor Field Types Query Stats Execution Plan

Book_ID	Book_Title	Publication_Date	Numb_Page	Price	Publisher	Language	Genre
2	Harry Potter and the Order of the Phoenix (Har...	2004-09-01	870	1305	Scholastic Inc.	eng	Novel
3	Harry Potter and the Chamber of Secrets (Harr...	2003-11-01	352	528	Scholastic	eng	Novel
4	Harry Potter and the Prisoner of Azkaban (Harr...	2004-05-01	435	653	Scholastic Inc.	eng	Novel
5	Harry Potter Boxed Set Books 1-5 (Harry Potte...	2004-09-13	2690	4035	Scholastic	eng	Novel
6	Unauthorized Harry Potter Book Seven News: "...	2005-04-26	152	228	Nimble Books	en-US	Novel
7	Harry Potter Collection (Harry Potter #1-6)	2005-09-12	3342	5013	Scholastic	eng	Novel
9	Data Smart	2004-09-01	235	306	Wiley	en	tech
10	God Created the Integers	2003-11-01	197	256	Penguin	en	tech
11	Superfreakonomics	2004-05-01	179	233	HarperCollins	en	science
12	Orientalism	2004-09-13	197	256	Penguin	en	nonfict
13	Nature of Statistical Learning Theory, The	2005-04-26	230	299	Springer	en	tech
14	Integration of the Indian States	2005-09-12	217	282	Orient Blacks...	en	nonfict
15	Drunkard's Walk, The	2005-11-01	197	256	Penguin	en	science
16	Image Processing & Mathematical Morphology	2002-04-30	241	313	CRC	en	tech
17	How to Think Like Sherlock Holmes	2004-08-03	240	312	Penguin	en	nonfict
18	Data Scientists at Work	2005-03-23	230	299	Apress	en	tech
20	Birth of a Theorem	2004-09-14	234	304	Bodley Head	fr	science
21	Structure & Interpretation of Computer Programs	2002-12-03	240	312	MIT Press	en	tech
22	Age of Wrath, The	2004-09-14	238	309	Penguin	en	nonfict
23	Trial, The	2001-05-15	198	257	Random House	en	fiction
24	Statistical Decision Theory'	2000-06-28	236	307	MIT Press	en	tech
30	Machine Learning for Hackers	2004-10-21	233	303	O'Reilly	en	tech
31	Signal and the Noise, The	2003-09-05	233	303	Penguin	en	tech
32	Python for Data Analysis	2002-10-01	233	303	O'Reilly	en	tech
33	Take-Down to Algorithms	2003-11-05	234	304	MIT Press	en	tech

Question 8 – ‘economy’ in the title

Describe Tables Select all from tables Question 5 Question 6* Question 7* **Question 8***

Limit to 1000 rows

```

1 • SELECT * FROM book
2 WHERE Book_Title LIKE '%economy%';

```

Result Grid Filter Rows: Edit: Export/Import: Wrap Cell Content:

Book_ID	Book_Title	Publication_Date	Numb_Page	Price	Publisher	Language	Genre
302	Advanced topics in economy	2009-06-04	364	869	Oriley	en	science
303	introduction to economy	2015-07-03	785	1520	sage	en	science
304	Behavioral economy	2010-05-03	486	786	sage	en	science
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Result Grid Form Editor

Question 9 – Group by genre, order by alphabetic title

Describe Tables Select all from tables Question 5 Question 6* Question 7* Question 8* **SQL File 9***

Limit to 1000 rows

```

1 • SELECT * FROM book
2 GROUP BY Genre
3 ORDER BY Book_Title;

```

Result Grid Filter Rows: Edit: Export/Import: Wrap Cell Content:

Book_ID	Book_Title	Publication_Date	Numb_Page	Price	Publisher	Language	Genre
8	Fundamentals of Wavelets	2006-09-16	228	296	Wiley	en	tech
1	Harry Potter and the Half-Blood Prince (Harry P...	2006-09-16	652	978	Scholastic Inc.	eng	Novel
12	Orientalism	2004-09-13	197	256	Penguin	en	nonfiction
27	Physics & Philosophy	1997-05-28	197	256	Penguin	en	philosophy
19	Slaughterhouse Five	1996-01-17	198	257	Random House	en	fiction
11	Superfreakonomics	2004-05-01	179	233	HarperCollins	en	science
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Result Grid Form Editor

Question 10 – authors who have published at least 3 books

The screenshot shows a SQL IDE interface with a query editor and a results pane. The query editor contains the following SQL code:

```
1 • SELECT First_Name, Last_Name, COUNT(book_author.AuthorID) as 'Books_Published', book_author.AuthorID
2 FROM author, book_author
3 WHERE author.Author_ID = book_author.AuthorID
4 GROUP BY book_author.AuthorID
5 HAVING Books_Published >= 3;
```

The results pane displays a single row of data:

First_Name	Last_Name	Books_Published	AuthorID
J.K.	Rowling	7	1

The interface includes a toolbar with various icons, a tab bar at the top with tabs for 'scribe Tables', 'Select all from tables', 'Question 5', 'Question 6*', 'Question 7*', 'Question 8*', 'Question 9', and 'SQL File 10*'. A 'Limit to 1000 rows' dropdown is also present. The results pane has a 'Filter Rows' input field, an 'Export' button, and a 'Wrap Cell Content' checkbox. A vertical toolbar on the right side contains icons for 'Result Grid', 'Form Editor', 'Field Types', 'Query Stats', and 'Execution Plan'. The bottom status bar shows 'Result 8' and 'Read Only'.

- I noticed that some authors have repeating names with different nationalities, but since author_ID is the primary key, I assume these are intentionally different

Question 11 – Business students with 2 or more books borrowed

Select all from tables Question 5 Question 6* Question 7* Question 8* Question 9 Question 10 Question 11* x

Limit to 1000 rows

```
1 SELECT student.Student_ID, First_Name, Last_Name, Count(book_student.StudentID) as 'Books_Borrowed'
2 FROM student, book_student
3 WHERE student.Student_ID = book_student.StudentID AND College = 'Business'
4 GROUP BY student.Student_ID
5 HAVING Books_Borrowed >= 2;
6
```

Result Grid Filter Rows: Export: Wrap Cell Content: [fA](#)

	Student_ID	First_Name	Last_Name	Books_Borrowed
▶	4119579	student 2	B	7
	4119584	student 7	G	7
	4119589	student 12	L	7
	4119594	student 17	Q	7
	4119599	student 22	V	6
	4119604	student 27	D	4
	4119605	student 28	F	4
	4119606	student 29	B	4

Result Grid Form Editor Field Types Query Stats Execution Plan

Result 3 x Read Only

Question 12 – Checkout dates for intro to economics

Question 5 Question 6* Question 7* Question 8* Question 9 Question 10 Question 11* Question 12* x

Limit to 1000 rows

```
1 • Select Check_Out_Date FROM book_student, book
2 WHERE book.Book_Title = "Introduction to Economics";
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: |

Check_Out_Date
2017-07-07 00:00:00
2012-12-27 00:00:00
2010-11-04 00:00:00
2010-04-02 00:00:00
2015-05-14 00:00:00
2017-12-28 00:00:00
2020-07-29 00:00:00
2019-05-15 00:00:00
2022-01-14 00:00:00
2018-11-02 00:00:00
2021-12-28 00:00:00
2017-04-25 00:00:00
2022-04-07 00:00:00
2011-12-19 00:00:00
2016-04-14 00:00:00
2019-05-15 00:00:00
2019-03-07 00:00:00
2014-04-25 00:00:00
2010-09-01 00:00:00
2021-05-19 00:00:00
2016-12-26 00:00:00
2020-03-20 00:00:00
2021-12-16 00:00:00
2018-09-28 00:00:00
2018-06-20 00:00:00
2018-06-20 00:00:00

Result 2 x Read Only

Result Grid
Form Editor
Field Types
Query Stats
Execution Plan