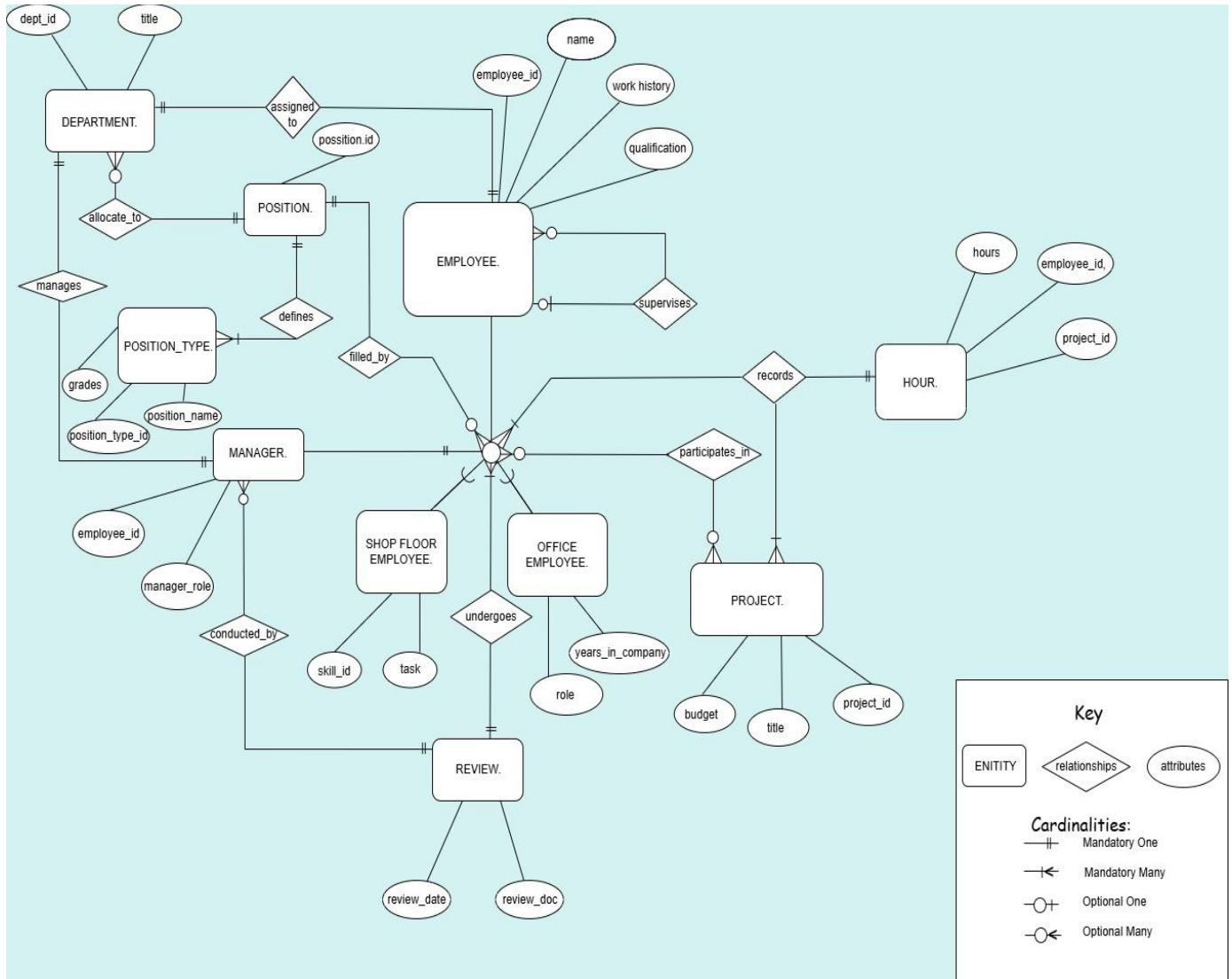


COURSE TITLE: DATA MANAGEMENT SYSTEM

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PART A: CONCEPTUAL MODELLING

QUESTION 1. Er DIAGRAM



QUESTION 2 - Rational Tables(with attributes) and justification

* DEPARTMENT (dept_id, title) - STRONG ENTITY

* POSITION_TYPE (position_type_id - PK, position_name, grades) - STRONG ENTITY

* POSITION (position_id - PK, position_type_id (FK → POSITION_TYPE), dept_id(FK-DEPARTMENT)
- ALLOCATED TO DEPARTMENT

* EMPLOYEE (employee_id - PK, name, work_history, qualification, dept_id [FK->DEPARTMENT],
supervisor_id [FK → EMPLOYEE, nullable]) - ASSIGNED TO DEPT + RECURSIVE SUPERVISES

* SHOP FLOOR EMPLOYEE (employee_id[PK = FK → EMPLOYEE], skill_id, task) - SUBCLASS

* OFFICE EMPLOYEE (employee_id[PK = FK → EMPLOYEE], role, years_in_company) - SUBCLASS

* MANAGER (employee_id[PK = FK → EMPLOYEE], manager_role) - WEAK ENTITY

* REVIEW (review_date, review_doc) - Weak on employee + conducted_by MANAGER

* PROJECT (project_id - PK, title, budget) - STRONG ENTITY

* HOUR (employee_id[FK → EMPLOYEE], project_id[FK → PROJECT], hours)

PART B: QUESTION 1 - SQL Programming

```
1.  
2. CREATE TABLE Author (  
3.     AuthorId VARCHAR(100) PRIMARY KEY,  
4.     Name VARCHAR(100) NOT NULL  
5. );  
6.  
7. INSERT INTO Author (AuthorId, Name) VALUES  
8. ('A011', 'Dingle R'),  
9. ('A012', 'Ransome A'),  
10.('A013', 'Wardale R'),  
11. ('A014', 'Alexander T'),  
12. ('A015', 'Spurrier S');  
13.  
14.  
15.  
16.  
17. CREATE TABLE Publisher (  
18.     PublisherId VARCHAR(100) PRIMARY KEY,  
19.     PublisherName VARCHAR(100) NOT NULL  
20.);  
21.  
22. INSERT INTO Publisher (PublisherId, PublisherName) VALUES  
23. ('P01', 'Pearson'),  
24. ('P02', 'HarperCollins'),  
25. ('P03', 'Simon and Schuster');  
26.
```

27.

28. CREATE TABLE Category (

29. CategoryId VARCHAR(10) PRIMARY KEY,

30. Type VARCHAR(50) NOT **NULL**

31.);

32.

33. INSERT INTO Category (CategoryId, Type) VALUES

34. ('C911', 'Short stories'),

35. ('C912', 'Journal articles'),

36. ('C913', 'Biography'),

37. ('C914', 'Illustrations');

38.

39.

40.

41.

42. CREATE TABLE Publication (

43. PubId VARCHAR(10) PRIMARY KEY,

44. AuthorId VARCHAR(10),

45. Title VARCHAR(100) NOT **NULL**,

46. CategoryId VARCHAR(10),

47. PublicationYear INT,

48. PublisherID VARCHAR(10),

49. FOREIGN KEY (AuthorId) REFERENCES Author(AuthorId),

50. FOREIGN KEY (CategoryId) REFERENCES Category(CategoryId),

51. FOREIGN KEY (PublisherID) REFERENCES Publisher(PublisherId)

52.);

53.

54. INSERT INTO
Publication (PubId, AuthorId, Title, CategoryId, PublicationYear, PublisherID) VALUES

55. ('P001', 'A011', 'The Blue Treacle', 'C911', 1911, 'P01'),

56. ('P002', 'A012', 'In Aleppo Once', 'C911', 2001, 'P01'),

57. ('P003', 'A012', 'Illustrating Arthur Ransome', 'C914', 1973, 'P03'),

58. ('P004', 'A012', 'Ransome the Artist', 'C914', 1994, 'P03'),

59. ('P005', 'A014', 'Bohemia In London', 'C912', 2008, 'P02'),

60. ('P006', 'A011', 'The Best of Childhood', 'C911', 2002, 'P01'),

61. ('P007', 'A015', 'Distilled Enthusiasms', 'C912', 2010, 'P02');

62.

63.

64.

65.

66. CREATE TABLE Users (

67. UserId VARCHAR(10) PRIMARY KEY,

68. Name VARCHAR(100) NOT NULL,

69. Email VARCHAR(100) NOT **NULL**,

70. Password VARCHAR(100) NOT **NULL**,

71. UNIQUE (Email)

72.);

73.

74. INSERT INTO Users (UserId, Name, Email, Password) VALUES

75. ('U111', 'Kenderine J', 'KenderineJ@hotmail.com', 'Kenj2'),

76. ('U241', 'Wang F', 'WangF@hotmail.com', 'Wanf05'),

77. ('U55', 'Flavel K', 'FlavelK@hotmail.com', 'Flak77'),

78. ('U016', 'Zidane Z', 'ZidaneZ@hotmail.com', 'Zidz13'),

79. ('U033', 'Patel M', 'PatelM@hotmail.com', 'PatelManish'),

80. ('U121', 'Keita R', 'KeitaR@hotmail.com', 'Keir22');

81.

82. CREATE TABLE Request (

83. UserId VARCHAR(10),

84. PublicationId VARCHAR(10),

85. **RequestDate DATE NOT NULL,**

86. PRIMARY KEY (UserId, PublicationId),

87. FOREIGN KEY (UserId) REFERENCES Users(UserId),

88. FOREIGN KEY (PublicationId) REFERENCES Publication(PubId)

89.);

90.

91. INSERT INTO Request (UserId, PublicationId, RequestDate) VALUES

92. ('U016', 'P001', '2020-10-05'),

93. ('U241', 'P001', '2020-09-28'),

94. ('U55', 'P002', '2020-09-08'),

95. **('U016', 'P004', '2020-10-06'),**

96. ('U121', 'P002', '2020-09-23');

OUTPUT -

Table Author

The screenshot shows a database interface with a toolbar at the top containing 'Result Grid', 'Filter Rows', and 'Edit' buttons. A context menu is open on the right side with options 'Result Grid' and 'Form Editor'. The main area displays a table with two columns: 'AuthorId' and 'Name'. The data rows are: A011 (Dingle R), A012 (Ransome A), A013 (Wardale R), A014 (Alexander T), A015 (Spurrier S), and a final row marked with an asterisk (*) and labeled 'NULL'.

	AuthorId	Name
▶	A011	Dingle R
	A012	Ransome A
	A013	Wardale R
	A014	Alexander T
*	A015	Spurrier S
	NULL	NULL

Table Publisher

The screenshot shows a database interface with a toolbar at the top containing 'Result Grid', 'Filter Rows', and 'Edit' buttons. A context menu is open on the right side with options 'Result Grid' and 'Form Editor'. The main area displays a table with two columns: 'PublisherId' and 'PublisherName'. The data rows are: P01 (Pearson), P02 (HarperCollins), P03 (Simon and Schuster), and a final row marked with an asterisk (*) and labeled 'NULL'.

	PublisherId	PublisherName
▶	P01	Pearson
	P02	HarperCollins
	P03	Simon and Schuster
*	NULL	NULL

Table Category

The screenshot shows a database interface with a toolbar at the top containing 'Result Grid', 'Filter Rows', and 'Edit' buttons. A context menu is open on the right side with options 'Result Grid' and 'Form Editor'. The main area displays a table with two columns: 'CategoryId' and 'Type'. The data rows are: C911 (Short stories), C912 (Journal articles), C913 (Biography), C914 (Illustrations), and a final row marked with an asterisk (*) and labeled 'NULL'.

	CategoryId	Type
▶	C911	Short stories
	C912	Journal articles
	C913	Biography
	C914	Illustrations
*	NULL	NULL

Table publication

	PubId	AuthorId	Title	CategoryId	PublicationY	
▶	P001	A011	The Blue Treacle	C911	1911	 Result Grid
	P002	A012	In Aleppo Once	C911	2001	 Form Editor
	P003	A012	Illustrating Arthur Ransome	C914	1973	
	P004	A012	Ransome the Artist	C914	1994	
	P005	A014	Bohemia In London	C912	2008	
	P006	A011	The Best of Childhood	C911	2002	
*	P007	A015	Distilled Enthusiasms	C912	2010	
*	NULL	NULL	NULL	NULL	NULL	

Table Users

	UserId	Name	Email	Password	
▶	U016	Zidane Z	ZidaneZ@hotmail.com	Zidz13	 Result Grid
	U033	Patel M	PatelM@hotmail.com	PatelManish	 Form Editor
	U111	Kenderine J	KenderineJ@hotmail.com	Kenj2	
	U121	Keita R	KeitaR@hotmail.com	Keir22	
	U241	Wang F	WangF@hotmail.com	Wanf05	
*	U55	Flavel K	FlavelK@hotmail.com	Flak77	
*	NULL	NULL	NULL	NULL	

Table Request

	UserId	PublicationId	RequestDate	
▶	U016	P001	2020-10-05	 Result Grid
	U016	P004	2020-10-06	 Form Editor
	U121	P002	2020-09-23	
	U241	P001	2020-09-28	
*	U55	P002	2020-09-08	
*	NULL	NULL	NULL	

PART B: Question 2a.

- Name & email of user and dates of their request.

input:

```
1. USE mydb;  
2. SELECT  
3.     Users.Name,  
4.     Users.Email,  
5.     Request.RequestDate  
6. FROM  
7.     Users  
8. JOIN  
9. Request ON Users.UserId = Request.UserId;
```

Output

	Name	Email	RequestDate
▶	Zidane Z	ZidaneZ@hotmail.com	2020-10-05
	Zidane Z	ZidaneZ@hotmail.com	2020-10-06
	Keita R	KeitaR@hotmail.com	2020-09-23
	Wang F	WangF@hotmail.com	2020-09-28
	Flavel K	FlavelK@hotmail.com	2020-09-08

Result Grid

Form Editor

PART B: Question 2b

- Detail of publication request made in Sept. 2020

```
1. USE mydb;  
2. SELECT  
3. Request.PublicationId,  
4. Publication.Title,  
5. DATE_FORMAT(Request.RequestDate, '%d-%b-%Y') AS RequestDate  
6. FROM  
7. Request  
8. JOIN  
9. Publication ON Request.PublicationId = Publication.PubId  
10. WHERE  
11. MONTH(Request.RequestDate) = 9 AND YEAR(Request.RequestDate) = 2020  
12. ORDER BY  
13. Request.RequestDate DESC;
```

Output:

Result Grid			Filter Rows:	Export:	Wrap Cell	Result Grid
PublicationId	Title	RequestDate				
P001	The Blue Treacle	28-Sep-2020				
P002	In Aleppo Once	23-Sep-2020				
P002	In Aleppo Once	08-Sep-2020				

PART B: Question 2c

```
1. SELECT  
2.     Users.Name AS UserName,  
3.     Publication.Title AS PublicationTitle,  
4.     Author.Name AS AuthorName  
5. FROM  
6. Request  
7. JOIN  
8.     Users ON Request.UserId = Users.UserId  
9. JOIN  
10.    Publication ON Request.PublicationId = Publication.PubId  
11. JOIN  
12.    Author ON Publication.AuthorId = Author.AuthorId;
```

names of users, publication title & and author name.

Output:

	UserName	PublicationTitle	AuthorName
▶	Zidane Z	The Blue Treade	Dingle R
	Wang F	The Blue Treade	Dingle R
	Keita R	In Aleppo Once	Ransome A
	Flavel K	In Aleppo Once	Ransome A
	Zidane Z	Ransome the Artist	Ransome A

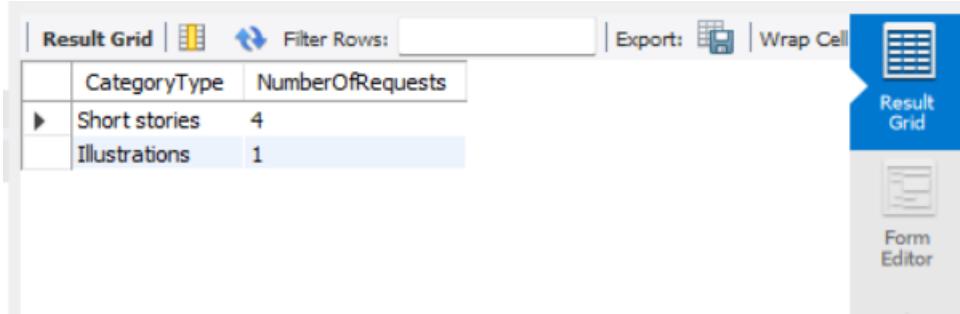


PART B: Question 2d

```
1. SELECT  
2.     Category.Type AS CategoryType,  
3.     COUNT(Request.PublicationId) AS NumberOfRequests  
4. FROM  
5.     Request  
6.     JOIN  
7.     Publication ON Request.PublicationId = Publication.PubId  
8.     JOIN  
9.     Category ON Publication.CategoryId = Category.CategoryId  
10. GROUP BY  
11.    Category.Type  
12. ORDER BY  
13.    NumberOfRequests DESC;
```

- Number of publications requested for each category.

Output:



The screenshot shows a software interface for viewing database results. At the top, there are buttons for 'Result Grid' (highlighted in blue), 'Filter Rows', and 'Export'. On the right side, there is a vertical toolbar with icons for 'Result Grid' (selected) and 'Form Editor'.

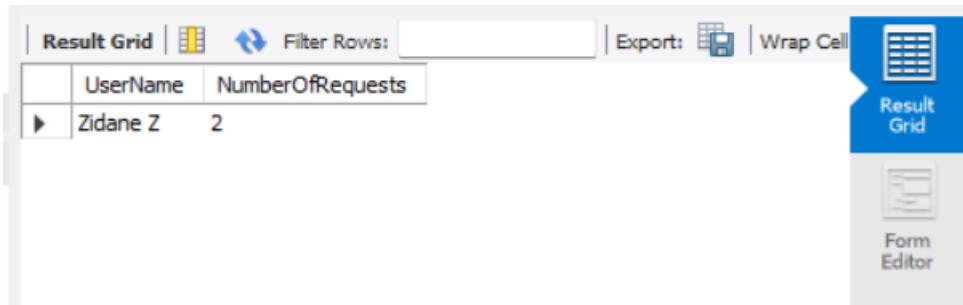
CategoryType	NumberOfRequests
Short stories	4
Illustrations	1

PART B: Question 2e

- users who requested more than 1 publication

```
1. SELECT  
2.     Users.Name AS UserName,  
3.     COUNT(Request.PublicationId) AS NumberOfRequests  
4. FROM  
5.     Request  
6.     JOIN  
7.     Users ON Request.UserId = Users.UserId  
8. GROUP BY  
9.     Users.UserId, Users.Name  
10. HAVING  
11.    COUNT(Request.PublicationId) > 1;
```

Output:



The screenshot shows a software interface for viewing database query results. At the top, there are buttons for 'Result Grid' (highlighted in blue), 'Filter Rows:', 'Export:', and 'Wrap Cell'. To the right of these buttons is a large blue button labeled 'Result Grid' with a grid icon. Below the top bar is a table with two columns: 'UserName' and 'NumberOfRequests'. A single row is visible, showing 'Zidane Z' in the 'UserName' column and '2' in the 'NumberOfRequests' column. To the right of the table is a grey sidebar with a 'Form Editor' button, which has a form icon.

	UserName	NumberOfRequests
▶	Zidane Z	2