NUMBER ONLY: Conger Yang

BASIC TASK:

- 1. Define the following terms:
- a. Candidate key :is composed of two or more attributes, but it must be minimal
- b. Composite key: a simple or composite key that is unique and minimal. It is minimal because every column is necessary in order to attain uniqueness.
- c. Foreign key: created to enable an attribute to relate to another entity in a one-to-one or one-to-many relationship
- d. Functional dependency: describes the relationship between attributes in a relation.

2.

3. For the following relational tables where the primary key is underlined identify any violation(s) of the relational integrity rules:

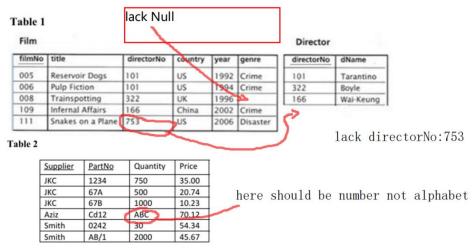


Table 3

Song	Artist	Position	Month	Year		
Woman	John Lennon	1	02	1981		
Make Your Mind Up	Bucks Fizz	2	04	1981	łack	Nu1]
You Can't Hurry Love	Phil Collins	11	02	1983		
It's a Hard Life	Queen	9	07	1984		
A Kind of Magic		5	04	1985		
Toy Boy	Sinitta	6	09	1987		
You Got It	Roy Orbison	4	02	1989		

4.

a.

ProjCode	ProJTitle	ProjManager	ProjBudget	EmpNo	EmpName	DeptNo	DeptNo	HrlyRate	
PRC10	Payroll System	M Scott	24500	S10001	J Kirk	L004	IT	£22.00	
PRC10	Payroll System	M Scott	24500	S10030	L Jones	L023	Pensions	£ 18. 50	
PRC10	Payroll System	M Scott	24500	S21010	P Lewis	L004	IT	£21.00	
PRC30	Skills Matrix	M. Uhura	20000	Nul1	Nu11	Nu11	Nu11	Nul1	
PRC45	Payroll System	L McCoy	17400	S10010	B Jones	L004	IT	£21.75	
PRC45	Payroll System	L McCoy	17400	S10001	J Kirk	L004	IT	£ 18. 00	
PRC45	Payroll System	L McCoy	17400	S31002	T Gilbert	L028	Database	£ 25. 50	
PRC45	Payroll System	L McCoy	17400	S13210	W Richards	L008	Salary	£17.00	
PRC64	CRM System	P Chekov	12250	S31002	T Gilbert	L028	Database	£23.25	
PRC64	CRM System	P Chekov	12250	S21010	P Lewis	L004	IT	£ 17. 50	
PRC64	CRM System	P Chekov	12250	S10034	B James	L009	HR	£ 16.50	

b.

ProjCode	ProJTitle	ProjManager	ProjBudget	EmpNo	EmpName	DeptNo	DeptNo	HrlyRate
PRC30	Skills Matrix	M. Uhura	20000	Nu11	Nu11	Nu11	Null	Null
PRC45	Payroll System	L McCoy	17400	S10010	B Jones	L004	IT	£ 21.75
PRC45	Payroll System	L McCoy	17400	S10001	J Kirk	L004	IT	£ 18. 00
PRC45	Payroll System	L McCoy	17400	S31002	T Gilbert	L028	Database	£ 25. 50
PRC45	Payroll System	L McCoy	17400	S13210	W Richards	L008	Salary	£17.00
PRC64	CRM System	P Chekov	12250	S31002	T Gilbert	L028	Database	£ 23. 25
PRC64	CRM System	P Chekov	12250	S21010	P Lewis	L004	IT	£ 17. 50
PRC64	CRM System	P Chekov	12250	S10034	B James	L009	HR	£ 16.50

c.

ProjCode	ProJTitle	ProjManager	ProjBudget	EmpNo	EmpName	DeptNo	DeptNo	HrlyRate	
PRC30	Skills Matrix	M. Uhura	20000	Null	Nul1	Nu11	Null	Null	
PRC45	Payroll System	L McCoy	17400	S10010	B Jones	L004	IT	£21.75	
PRC45	Payroll System	L McCoy	17400	S10001	J Kirk	L009	IT	£ 18. 00	
PRC45	Payroll System	L McCoy	17400	S31002	T Gilbert	L028	Database	£ 25. 50	
PRC45	Payroll System	L McCoy	17400	S13210	W Richards	L008	Salary	£17.00	
PRC64	CRM System	P Chekov	12250	S31002	T Gilbert	L028	Database	£ 23. 25	
PRC64	CRM System	P Chekov	12250	S21010	P Lewis	L004	IT	£ 17. 50	
PRC64	CRM System	P Chekov	12250	S10034	B James	L009	HR	£ 16. 50	

d.

1NF

ProjCode	ProJTitle	ProjManager	ProjBudget	ProjCode	EmpNo	EmpName	DeptNo	DeptNo	HrlyRate
PRC30	Skills Matrix	M. Uhura	20000	PRC30	Nul1	Nu11	Nu11	Nu11	Nu11
PRC45	Payroll System	L McCoy	17400	PRC45	S10010	B Jones	L004	IT	£21.75
PRC64	CRM System	P Chekov	12250	PRC45	S10001	J Kirk	L009	IT	£ 18.00
				PRC45	S31002	T Gilbert	L028	Database	£ 25.50
				PRC45	S13210	W Richards	L008	Salary	£ 17.00
				PRC64	S31002	T Gilbert	L028	Database	£ 23. 25
				PRC64	S21010	P Lewis	L004	IT	£ 17.50
				PRC64	S10034	B James	L009	HR	£ 16.50

e. AND g(i don't know how to continues divide it)

2NF AND 3NF

	ProjCode	EmpNo	Emp1	Vame	Hrl	yRate					
	PRC30	Null	Nu	11	Nı	ull					
	PRC45	S10010	В Јо	nes	£ 2	21. 75					
	PRC45	S10001	JК	irk	£ 1	18. 00					
	PRC45	S31002	T Gil	bert	£2	25. 50					
	PRC45	S13210	W Ric	hards	£ 1	7. 00	ProjCod	e DeptNo	Dep	tNo	
	PRC64	S31002	T Gil	bert	£ 2	23. 25	PRC30	Nu11	Nu	11	
	PRC64	S21010	P Le	ewis	£ 1	7. 50	PRC45	L004	I	T	
	PRC64	S10034	В Ја	ames	£ 1	16. 50	PRC45	L009	I	T	
							PRC45	L028	Data	base	
							PRC45	L008	Sal	ary	
ProjCode	ProJ	Title	ProjMa	nager	Projl	Budget	PRC64	L028	Data	base	
PRC30	Skills	Matrix	M. U	hura	20	0000	PRC64	L004	I	T	
PRC45	Payrol1	l System	L Mo	Coy	17	400	PRC64	L009	Н	R	
PRC64	CRM S	System	P Ch	ekov	12	2250					

5.

- a. An error occurred in the calculation of the total amount
- b. 1NF

Order No.	ACC. NO	Customer		Adress	÷	Date
7823	178	Daisy's Cafe	27 B	ay Drive,	Cove	16-Jul
2276	167	Sally's Snacks	3High	Street, Ba	nchory	17-Jul
1788	32	Tasty Bite	17 Wo	od Place,	Insch	18-Jul
4633	526	Smiths	12 Dee	e View, Ab	erdeen	16-Jul
	Order No.	item	Qty	Price	Total	Cost
	7823	Bakewell Tart	20	0. 15	£	1.8
	7823	Bakewell Tart	13	0.2	£	2.6
	7823	Bakewell Tart	45	0. 15	£ 6	5. 75
	2276	Apple Pie	130	0. 15	£	24
	2276	Cherry Pie	120	0. 18	£ 1	9. 5
	2276	Steak Pie	100	0. 5	£	18
	2276	Meringue Pie	30	0.2	£	15
	1788	Apple Pie	15	0. 15	£	2.4
	1788	Danish Pastry	50	0.2	£2	2. 25
	4633	Butteries	120	0. 2	£	10

c. 2NF

Order No.	item	Qty	Order No.	item	Price
7823	Bakewell Tart	20	7823	Bakewell Tart	0. 15
7823	Danish Pastry	13	7823	Danish Pastry	0. 2
7823	Apple Pie	45	7823	Apple Pie	0. 15
4633	Butteries	120	4633	Butteries	0. 2
2276	Apple Pie	130	2276	Apple Pie	0. 15
2276	Cherry Pie	100	2276	Cherry Pie	0. 18
2276	Steak Pie	30	2276	Steak Pie	0. 5
2276	Meringue Pie	20	2276	Meringue Pie	0. 2
1788	Apple Pie	15	1788	Apple Pie	0. 15
1788	Danish Pastry	50	1788	Danish Pastry	0.2

d. 3NF

			Order No.	it	em	Qty		Order No.	it	em	Price
			7823	Bakewel	ll Tart	20		7823	Bakewe:	ll Tart	0.15
			7823	Danish	Pastry	13		7823	Danish	Pastry	0. 2
			7823	Apple	e Pie	45		7823	Apple	e Pie	0. 15
			4633	Butte	eries	120		4633	Butte	eries	0. 2
			2276	Apple	Pie	130		2276	Apple	e Pie	0. 15
			2276	Cherr	y Pie	100		2276	Cherr	y Pie	0. 18
			2276	Steal	k Pie	30		2276	Steal	k Pie	0. 5
			2276	Mering	ue Pie	20		2276	Mering	ue Pie	0. 2
			1788	Apple	e Pie	15		1788	Apple	e Pie	0. 15
			1788	Danish	Pastry	50		1788	Danish	Pastry	0. 2
Order No.	ACC. NO	Cust	omer		Adress		Date		ACC. NO	Total	Cost
7823	178	Daisy'	s Cafe	27 B	ay Drive	, Cove	16-Jul		178	£1	1. 15
4633	526	Smi	ths	12 Dee	View, Ab	erdeen	16-Jul		526	£	24
2276	167	Sally's	Snacks	3High	Street, B	anchory	17-Jul		167	£	56. 5
1788	32	Tasty	Bite	I	asty Bit	e	18-Jul		32	£1	2, 25

TABLE STUDENTS

1NF

Student No	Name	Course	Course Duration	Module No	Module Name	Lecturer
1002	Salif Keita	G701	4	COF104	Java	Asimov
1005	Emma Wilson	G504	3	COF118	Distributed Systems	Patel
1006	Hong Wang	G701	4	COF105	Computer Achitecture	Zidane
1010	Kiri Anahera	G722	2	COF118	Distributed Systems	Patel
				COF120	Operating Systems	Brando
				COF111	Networks	Austin
				COF105	Computer Achitecture	Zidane
				COF111	Networks	Austin
				COF105	Computer Achitecture	Zidane

2NF

Student No	Module No	Module Name	Module No	Module Name	Lecturer
1002	COF104	Java	COF104	Java	Asimov
	COF118	Distributed Systems	COF118	Distributed Systems	Patel
1005	COF105	Computer Achitecture	COF105	Computer Achitecture	Zidane
	COF118	Distributed Systems	COF120	Operating Systems	Brando
	COF120	Operating Systems	COF111	Networks	Austin
1006	COF111	Networks			
	COF105	Computer Achitecture			
1010	COF111	Networks			
	COF105	Computer Achitecture			

3NF

Student No	Module No	Module Name	Module No	Module Name	Lecturer	
1002	COF104	Java	COF104	Java	Asimov	
	COF118	Distributed Systems	COF118	Distributed Systems	Patel	
1005	COF105	Computer Achitecture	COF105	Computer Achitecture	Zidane	
	COF118	Distributed Systems	COF120	Operating Systems	Brando	
	COF120	Operating Systems	COF111	Networks	Austin	
1006	COF111	Networks				
	COF105	Computer Achitecture				
1010	COF111	Networks				
	COF105	Computer Achitecture				
Student No	Name	Course	Course Duration	Student No	Course	Course Duration
1002	Salif Keita	G701	4	1002	G701	4
1005	Emma Wilson	G504	3	1005	G504	3
1006	Hong Wang	G701	4	1006	G701	4
1010	Kiri Anahera	G722	2	1010	G722	2

6. a.

b.

c. Generate the corresponding ER diagram

Patient								
<u>PatientNo</u>	Surname	FirstNname						
A102	Losey	Josef						
B372	Shahine	Youcef						
B543	Kurusawa	Akira						
B444	Ray	Satyajit						
S555	Renoir	Jean						

<u>PatientNo</u>	Admitted	Discharged	Ward
A102	2/05/2017	9/05/2017	Α
A102	2/12/2016	2/01/2017	Α
S555	5/10/2017	3/12/2017	В
B444	1/12/2016	1/01/2017	В
S555	5/07/2017	1/08/2017	Α

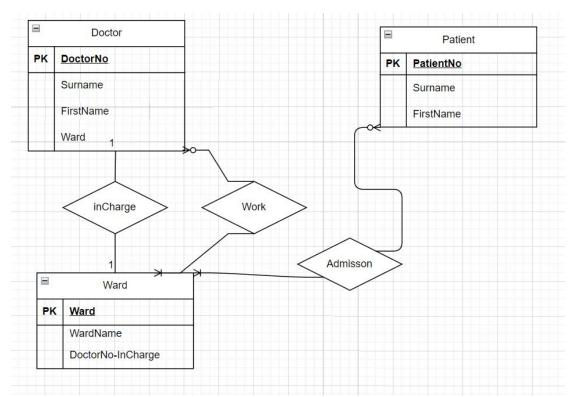
Doctor

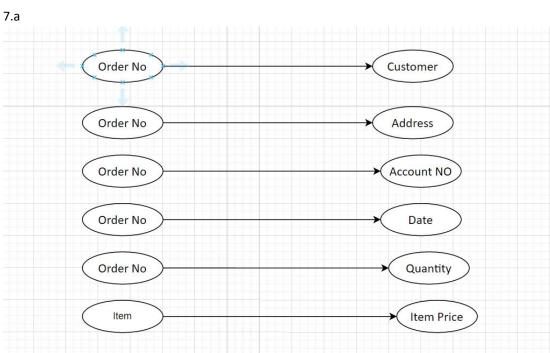
Surname	FirstName	Ward	
Ousmane	Sembene	Α	
Coppola	Sofia	Α	
Almodovar	Pedro	В	
Kubrik	Stanley	В	
Fellini	Federico	С	
Boyle	Danny	Α	
	Ousmane Coppola Almodovar Kuhrik Fellini	Ousmane Sembene Coppola Sofia Almodovar Pedro Kunrik Stanley Fellini Federico	

Ward

Ward	WardName	DoctorNo- InCharge		
Α	Surgical	203		
В	Paediatric	574		
С	Medical	530		

c.







Account No.	Customer	Customer Address		Date	
178	Daisy's Cafe	27 Bay Conv	Drive, ventry	7/16	
526	Smiths		Dee berdeen	7/16	
167	Sally's Snacks	3 High Band	7/17		
032	Tasty Bite	17 Wood Piace, Liverpool		7/18	
Account No.	Ite	em	Quantity	Item Price	
178	Baskw	ell Tart	20	0.15	
		nish stry	13	0.20	
	Appl		45	0.15	
526	Butte	erires	120	0.20	
167	Appl	Apple pie 45		0.15	
	Cherr	ry pie	100	0.18	
	Stea	k pie	30	0.50	
	Mering	jue pie	20	0.20	
032	Appl	e pie	15	0.15	
	Dar Pas	nish stry	50	0.20	

c. 2NF

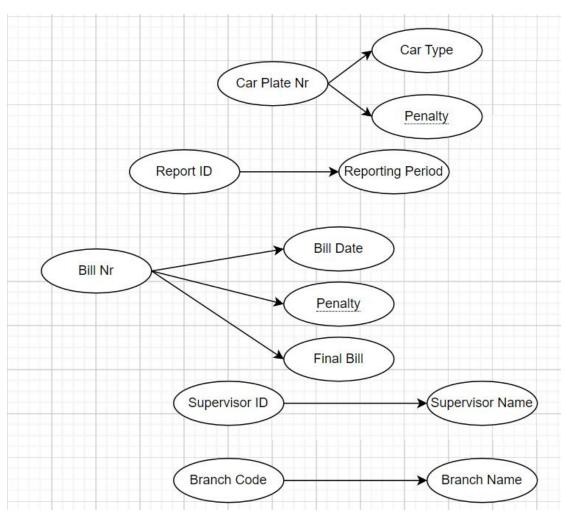
Account No.	Item	Item Price	Account No.	Quantity
178	Baskwell Tart	0.15	178	78
	Danish Pastry	0.20	526	120
	Apple pie	0.15	167	175
526	Butterires	0.20	032	65
167	Apple pie	0.15		
	Cherry pie	0.18		
	Steak pie	0.50		
	Meringue pie	0.20		
032	Apple pie	0.15		
	Danish Pastry	0.20		

d.3NF

Account No.	Item	Item Price	Account No.	Quantity	Oder No.	Custome r	Date
178	Baskwell Tart	0.15	178	78	7823	Daisy's Cafe	7/16
	Danish Pastry	0.20	526	120	4633	Smiths	7/16
	Apple pie	0.15	167	175	2276	Sally's Snacks	7/17
526	Butterires	0.20	032	65	1788	Tasty Bite	7/18
167	Apple pie	0.15					
	Cherry pie	0.18	Account No.	Addres			
			178	27 Bay Driv	ve,		
	Steak pie	0.50		Convent			
			526	12 Dee			
	Meringue pie	0.20		View, Abero	deen		
			167	3 High Stre	eet,		
032	Apple pie	0.15		Banchor	ry		
			032	17 Wood P	iace,		
	Danish Pastry	0.20		Liverpoo	ol		

8.

a.



b.

1NF

Reprot ID	Reportir	Reporting Period Branch Code Branch Name			ranch Name	Supervisor	Supervisor Name	
7686	January 2021	to March 2021	8767	734	Walsall	102	David Brown	
1056	Octobrer 2021 to	21 to December 2021 100023		023	Coventry	871	Anna Smith	
4981	January 2022	to March 2022	456109 Leamington Spa		149	John Cruise		
4832	January 2022	to March 2022	9812	256	Warwick	823	James Doherty	
7002	July 2021 to September 2021		9812	256	Warwick	823	James Doherty	
3121	April 2021 t	o June 2021	5559	901 W	olverhampton	111	Catherine Johnson	
Reprot ID	Car Plate Nr	Car Type	Bill Nr	Bill Date	Penalty	Final Bill		
7686	DS4049	SUV	166651	18.01.2021	50	1050		
7686	DL3434	Sports Car	123111	19.02.2021	0	500		
7686	OP9817	SUV	561909	06.03.2021	0	480		
7686	SJ7182	Hactchback	565690	29.01.2021	0	680		
1056	BN9745	SUV	128976	10.10.2021	0	710		
1056	LA5142	Sedan	511899	25.11.2021	20	1500		
1056	CB0098	Sports Car	141421	03.12.2021	0	850		
1056	ZX7222	Coupe	514879	29.10.2021	0	1250		
1056	DL3434	Sports Car	771100	16.11.2021	20	300		
4981	PO8123	SUV	675912	06.01.2021	50	350		
4981	IU7878	Hactchback	991762	08.02.2021	0	950		
4832	NM8787	Sports Car	876234	14.02.2021	0	350		
7002	OP9817	SUV	110054	19.07.2021	100	1400		
7002	NM8787	Sports Car	378123	12.08.2021	20	450		
7002	VC1111	Sedan	808051	18.09.2021	0	670		
7002	FG7100	Hactchback	100023	21.07.2021	0	1030		
7002	RE6000	Sedan	611554	27.08.2021	50	520		
3121	TR6199	SUV	888712	10.04.2021	0	490		
3121	DL3434	Sports Car	343412	28.05.2021	20	1230		
3121	BP9111	Coupe	222678	04.06.2021	0	1680		

2NF

Reprot ID	Car Plate Nr	Car Type	Reprot ID	Bill Nr	Bill Date	Penalty	Final Bill
7686	DS4049	SUV	7686	166651	18.01.2021	50	1050
7686	DL3434	Sports Car	7686	123111	19.02.2021	0	500
7686	OP9817	SUV	7686	561909	06.03.2021	0	480
7686	SJ7182	Hactchback	7686	565690	29.01.2021	0	680
1056	BN9745	SUV	1056	128976	10.10.2021	0	710
1056	LA5142	Sedan	1056	511899	25.11.2021	20	1500
1056	CB0098	Sports Car	1056	141421	03.12.2021	0	850
1056	ZX7222	Coupe	1056	514879	29.10.2021	0	1250
1056	DL3434	Sports Car	1056	771100	16.11.2021	20	300
4981	PO8123	SUV	4981	675912	06.01.2021	50	350
4981	IU7878	Hactchback	4981	991762	08.02.2021	0	950
4832	NM8787	Sports Car	4832	876234	14.02.2021	0	350
7002	OP9817	SUV	7002	110054	19.07.2021	100	1400
7002	NM8787	Sports Car	7002	378123	12.08.2021	20	450
7002	VC1111	Sedan	7002	808051	18.09.2021	0	670
7002	FG7100	Hactchback	7002	100023	21.07.2021	0	1030
7002	RE6000	Sedan	7002	611554	27.08.2021	50	520
3121	TR6199	SUV	3121	888712	10.04.2021	0	490
3121	DL3434	Sports Car	3121	343412	28.05.2021	20	1230
3121	BP9111	Coupe	3121	222678	04.06.2021	0	1680

Reprot	Car P	late Nr	Car Typ	e	Bill N	Penalty	Final Bill				
686	DS4	049	SUV		1666	51 50	1050				
686	DL3	434	Sports C	ar	1231	11 0	500				
686	OPS	817	SUV		5619	0 0	480				
686	SJ7	182	Hactchba	ick	5656	0 0	680				
1056	BNS	745	SUV		1289	76 0	710				
1056	LA5		Sedan		5118		1500				
1056	CBC		Sports C	ar	1414		850				
056	ZX7		Coupe		5148		1250				
056	DL3		Sports C		7711		300				
981	POS		SUV			12 50	350				
981	IU7		Hactchba	ck	9917		950				
832	NM8		Sports C		8762		350				
002	OPS		SUV		1100		1400				
002	NM8		Sports C	ar	3781		450				
002	VC1		Sedan		8080		670				
7002	FG7		Hactchba		1000		1030				
7002	REG		Sedan		6115		520				
3121	TRE		SUV		8887		490				
3121	DL3		Sports C	or		12 20	1230				
3121	BPS		Coupe		2226		1680				
	5:11.11	5		_							
Reprot	Bill Nr	Bill I		Re			ting Period	Branch Code	Branch Name	Supervisor	Supervisor Name
686	166651	18.01		768			21 to March 2021	876734	Walsall	102	David Brown
686	123111	19.02		105			to December 2021	100023	Coventry	871	Anna Smith
686	561909	06.03		498			22 to March 2022	456109	Leamington Spa	149	John Cruise
686	565690	29.01		483			22 to March 2022	981256	Warwick	823	James Doherty
056	128976	10.10		700			September 2021	981256	Warwick	823	James Doherty
056	511899	25.11		312	1	April 202	1 to June 2021	555901	Wolverhampton	111	Catherine Johnson
056	141421	03.12									
056	514879	29.10									
056	771100	16.11									
1981	675912	06.01									
981	991762	08.02									
832	876234	14.02									
002	110054	19.07									
002	378123	12.08	.2021								
002	808051	18.09	.2021								
002	100023	21.07	.2021								
002	611554	27.08	.2021								
3121	888712	10.04	.2021								
3121	343412	28.05	.2021								
3121	222678	04.06									

9.

a.

b.

