

## Normalization

### 1. VideoStore Relation

TransID	RentDate	CustomerID	CustName	CustPhone	VideoID	VideoTitle	#Copy	ChargePerCopy
T001	01/12/02	C1223	Ai Li Lim	07-12345678	V001	Titanic	2	RM2.00
T001	01/12/02	C1223	Ai Li Lim	07-12345678	V006	The Tuxedo	1	RM1.50
T002	02/12/02	C1225	Aee Sy Go	07-87654321	V001	Titanic	1	RM2.00
T002	02/12/02	C1225	Aee Sy Go	07-87654321	V002	Office Ghosts	1	RM1.50
T002	02/12/02	C1225	Aee Sy Go	07-87654321	V008	The Signs	1	RM1.50

- Normalize the above structure to 1NF, 2NF and 3NF by providing meaningful relation names.
- The table is susceptible to anomalies. Provide examples of insertion, deletion and modification anomalies.
- Based on 3NF, draw an E-R diagram (Crow's Foot notation).

2. A construction company manages several building projects. Each project has its project number, name and employees assigned to the project. Each employee has an employee number, name and job classification. The pay rate is dependent on the employee's position.

ProjectNumber	ProjectName	EmployeeNumber	EmployeeName	JobClassification	ChargePerHour	Hours
PRO3001	Marianne	E1001	Eric Heng	Computer Technology	80	18
		E1002	Gary Chee	Electronic Engineering	75	16
		E1004	Raymond Low	Computer Technology	80	19
PRO3002	Coast	E1001	Eric Heng	Computer Technology	80	13
		E1003	Melvin Sim	Biology Engineering	77	17
PRO3003	Satellite	E1004	Raymond Low	Computer Technology	80	15
		E1002	Gary Chee	Electronic Engineering	75	15

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3. Examine the following relation describing the facial treatment transactions for a beauty therapy saloon.

CustID	CustName	CustSkinType	TreatmentDate	TreatmentCode	TreatmentDesc	BeauticianID	BeauticianName
C1003	Yee Si Go	Normal	08/01/2003	NOF	Normal Facial	B008	Susan
C1003	Yee Si Go	Normal	08/01/2003	ETR	Eye Treatment	B203	Linda
C1003	Yee Si Go	Normal	18/01/2003	NOF	Normal Facial	B108	Esther
C1004	Ai Li Lim	Dry	02/01/2003	NOF	Normal Facial	B108	Esther
C1004	Ai Li Lim	Dry	10/01/2003	NTR	Neck Treatment	B008	Susan
C1005	Ellen Tan	Oily	11/01/2003	NOF	Normal Facial	B203	Linda
C1005	Ellen Tan	Oily	11/01/2003	ETR	Eye Treatment	B203	Linda

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4. The table shown below is the Account table called Account in a banking system.

CustomerName	CustomerAddress	AccountNumber	TransactionCode	TransactionDescription	TransactionDate	Amount
Gary Chee	Segamat	A1223	DEP	Deposit	08/01/2003	1000
Gary Chee	Segamat	A1223	WDR	Withdraw	08/01/2003	500
Gary Chee	Segamat	A1223	WDR	Withdraw	10/01/2003	300
Gary Chee	Segamat	A1223	DEP	Deposit	30/01/2003	1200
Ellen Tan	Bukit Siput	A1224	WDR	Withdraw	08/01/2003	500
Melvin Sim	Labis	A1225	DEP	Deposit	08/01/2003	800

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5. The table shown below lists dentist-patient appointment data. A patient is given an appointment at a specific time and date with a dentist located at a particular surgery. On each day of patient appointments, a dentist is allocated to a specific surgery for that day.

StaffNo	DentistName	PatientNo	PatientName	Appointment		SurgeryRoomNo	SurgeryRoomDesc
				Date	Time		
S1011	Gary Chee	P100	Eddie Koh	12-Sept-02	1.00p.m.	S15	Room C
		P100	Eddie Koh	12-Sept-02	4.30p.m.	S15	Room C
S1024	Jenny Tay	P108	Melvin Sim	12-Sept-02	12.30p.m.	S10	Room B
		P110	Alice Go	14-Sept-02	12.30p.m.	S10	Room B
S1032	Ellen Tan	P105	Raymand Low	14-Sept-02	10.00p.m.	S15	Room C
		P110	Alice Go	15-Sept-02	10.30p.m.	S13	Room A

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6. Pigeon Healthcare Center provides a free treatment daily for each customer. Each treatment time (in minutes) is recorded.

CustNo	CustName	CustContact	StateCode	StateDesc	TreatDate	TreatID	TreatDesc	TreatTime
C1003	Yee Si Go	012-22552255	S01	Kuala Lumpur	08/01/2017	T001	Electronic Chair	35
C1004	Ai Li Lim	012-33882288	S02	Selangor	08/01/2017	T001	Electronic Chair	30
C1005	Ellen Tan	012-55335533	S01	Kuala Lumpur	08/01/2017	T002	Foot Massage	75
C1003	Yee Si Go	012-22552255	S01	Kuala Lumpur	09/01/2017	T001	Electronic Chair	38
C1004	Ai Li Lim	012-33882288	S02	Selangor	09/01/2017	T002	Foot Massage	70
C1005	Ellen Tan	012-55335533	S01	Kuala Lumpur	09/01/2017	T003	Body Slimming	55

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7. Pigeon Home Estate has three branches that manage a lot of properties within Selangor and Kuala Lumpur. Each property is allocate to one and only one branch and manages by one and only one agent.

BranchNo	BranchName	BranchManager	AgentCode	AgentName	PropertyNo	PropertyAddress	Owner	Rent
B001	Love Pigeon	Eric	A01	Coco	P0001	Setapak Ria	Rose	800
B001	Love Pigeon	Eric	A02	Thomas	P0002	Menara Alpha	May	1000
B002	Big Pigeon	Almond	A03	Jack	P0003	TAR Villa	Rich	1200
B003	Little Pigeon	Justine	A04	Alice	P0004	Beta Condo	Mandy	1300
B003	Little Pigeon	Justine	A04	Alice	P0005	Setapak Ria	Rose	850

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8. Consider the following first normal form relation for Travel\_Agency:

<b>Bus_Plate_ No</b>	<b>No_Of_ Seats</b>	<b>Destination_ Code</b>	<b>Destination_ Description</b>	<b>Customer_ Code</b>	<b>Customer_ Name</b>	<b>Customer_ Tel_No</b>	<b>Departure_ Date</b>
JBA1234	40	TM1	Tioman	C001	Chong PF	7153918	08/11/02
JBA1234	40	TM1	Tioman	C002	Fong KA	6129015	08/11/02
WFU3333	35	PK1	Pangkor	C003	Liew HW	7696551	08/11/02
JBA1234	40	LK1	Langkawi	C001	Chong PF	7153918	18/11/02
JBA5678	30	TM1	Tioman	C003	Liew HW	7696551	08/12/02
WFU3333	35	PK1	Pangkor	C003	Liew HW	7696551	18/12/02

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