Assignment 7: 3NF Normalization

Jose Manipon, 500906166

Amiel Castillo, 500883624

Anthony Trinh, 500831193

Hospital:

	HOSPITAL_ID	HOSPITAL_NAME	ADDRESS_STREET	ADDRESS_STREET2	ADDRESS_CITY	ADDRESS_PROVINCE	ADDRESS_POSTALCODE	ADDRESS_COUNTRY	PHONE
1	123	Toronto General Hospital	200 Elizabeth St	(null)	Toronto	ON	M5G2C4	CAD	4167895297
2	124	Michael Garron Hospital	825 Coxwell Ave	(null)	East York	ON	M4C3E7	CAD	4167893127
3	125	Toronto Western Hospital	399 Bathurst St	(null)	Toronto	ON	M5T2S8	CAD	4167898713

Hospital ID → {Hospital Name, Address, Phone}

1NF: This table has no multivalued (atomic values) attributes or nested relations, all entries in column are the same type and unique column identifiers are used.

2NF: All non-primary attributes are dependent on the primary key. The table does not have a primary key which contains values >1 therefore partial dependencies do not exist.

3NF: All non-primary attributes are determined Only by the primary key in the table therefore transitive dependencies do not exist

Therefore, **this table is in 3NF.**

Employee:

	EMPLOYEE_ID	F_NAME	L_NAME	DATE_OF_BIRTH	GENDER	AGE	ADDRESS_STREET	ADDRESS_STREET2	ADDRESS_CITY	ADDRESS_PROVINCE	ADDRESS_POSTALCODE	ADDRESS_COUNTRY	PHONE	EMAIL	HOSPITAL_I
1	323952	Andrew	Musak	87-07-12	M	33	121 Collins Rd.	(null)	Toronto	ON	M1V1N3	CAD	4168794561	dr.andrew.musak33@gmail.com	12
2	323678	Mindy	Ramirez	90-10-10	F	30	126 Sisao St.	(null)	Toronto	ON	M1P4R2	CAD	6475213125	mindy.ramirez@gmail.com	12
3	323679	John	Cooper	89-08-10	M	27	B9 Prospect Street	(null)	Toronto	ON	M1PX13	CAD	6475213256	cooper.john@gmail.com	12
4	323680	Michelle	Stanley	91-10-06	F	30	202 Enble Street	(null)	Toronto	ON	M1D13C	CAD	6473125676	stanley.michelle@gmail.com	12
5	323681	Samuel	Honey	90-10-12	M	31	A4 Laven Street	(null)	Toronto	AL	M2X3B1	CAD	64753561234	samuel.honey@gmail.com	12
6	323682	Ruby	Yul	92-10-11	F	26	C6 Thorne Street	(null)	Toronto	ON	M2R32X	CAD	6475352132	ruby.yul@gmail.com	12
7	323683	Robert	Smith	82-12-15	M	38	123 Bay Rd.	(null)	Toronto	ON	M1V1N2	CAD	416279454	rsmith@gmail.com	12

Employee ID → { First Name, Last Name, DOB, Gender, Address, Phone, Email, Age }

1NF: This table has no multivalued (atomic values) attributes or nested relations, all entries in column are the same type and unique column identifiers are used.

2NF: All non-primary attributes are dependent on the primary key. The table does not have a primary key which contains values >1 therefore partial dependencies do not exist.

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Doctor:

	DOCTOR_ID	DOCTORLICENSE_EXPIRY	EMPLOYEE_ID
1	141524	30-03-06	323952
2	141525	20-03-12	323678
3	141526	12-04-06	323679

Doctor ID → { Employee ID, Doctor License Expiry }

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2NF: All non-primary attributes are dependent on the primary key. The table does not have a primary key which contains values >1 therefore partial dependencies do not exist.

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Nurse:

	NURSE_ID	NURSELICENSE_EXPIRY	EMPLOYEE_ID
1	555879	25-09-10	323680
2	555880	22-09-11	323681
3	555881	23-10-10	323682

Nurse ID → { Nurse License Expiry, Nurse ID }

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3NF: All non-primary attributes are determined Only by the primary key in the table therefore transitive dependencies do not exist

Therefore, **this table is in 3NF.**

Patient FDs:

	HEALTHCA...	F_...	L_NAME	DATE_OF_BIRTH	GENDER	AGE	ADDRESS_STREET	ADDRESS_STREET2	ADDRESS_CITY	ADDRESS_PROVINCE	ADDRESS_POSTALCODE	ADDRESS_COUNTRY	PHONE	EMAIL	HOSPITAL_ID
1	1234567890	Ann	Smith	97-01-28	F	22	1290 Bayview Rd.	(null)	Toronto	ON	M1B2X4	CAD	6471234567	ann.smith97@gmail.com	123
2	1234567891	Bob	Brown	00-02-21	M	20	11 Clifton St.	(null)	Toronto	ON	M2C1L5	CAD	6471234568	bob.brown00@hotmail.com	124
3	1234567892	Carl	Jones	99-07-11	M	21	103 Roadhouse Rd.	(null)	Oakville	ON	L6L2X6	CAD	4162578564	carl.jones99@gmail.com	125
4	1234567893	Dan	Miller	98-04-07	M	22	56 Steeling Ave.	(null)	Pickering	ON	L1V0A1	CAD	4162874587	dan.miller98@gmail.com	125
5	1234567894	Eve	Williams	98-01-22	F	22	23 Greentint Cres.	(null)	Markham	ON	L1C3P2	CAD	6478985674	eve.williams22@hotmail.com	124
6	1234567895	Stan	Murphy	99-01-29	M	30	1111 Bayview Rd.	(null)	Toronto	ON	M1B2X4	CAD	6471212311	stan.murphy@gmail.com	123
7	1234567896	Alice	Yum	20-03-21	F	21	11 Steeling St.	(null)	Toronto	ON	M2C3CD	CAD	6471234231	yum.alice@hotmail.com	123
8	1234567897	Steve	Jan	20-07-12	M	23	2 Ins Street	(null)	Oakville	ON	L6L2X	CAD	4162532313	steve.jan@gmail.com	124
9	1234567898	Mike	Lanny	90-08-07	M	40	55 Steeling Ave.	(null)	Pickering	ON	L1DED	CAD	4162875561	mike.lanny@gmail.com	125
10	1234567899	Camy	Hun	32-01-30	F	30	2 Hopkins Street	(null)	Markham	ON	L1QD2P	CAD	6478983164	camy.hun@hotmail.com	123

Healthcard # → { First name, Last name, DOB, Gender, Address, Phone, Email, Hospital ID }

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2NF: All non-primary attributes are dependent on the primary key. The table does not have a primary key which contains values >1 therefore partial dependencies do not exist.

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Appointment:

	APPOINTMENT_ID	APPOINTMENT_DATE	APPOINTMENT_TIME	ROOM_NO	NURSE_ID	HEALTHCARD_NO	DOCTOR_ID	HOSPITAL_ID
1	10031	20-12-12	1300	1	555879	1234567890	141524	123
2	10012	20-10-20	1400	2	555880	1234567897	141526	124
3	10013	20-10-22	1500	3	555881	1234567892	141525	125

Appointment ID → { Appointment Date, Appointment Time, Room Number, Nurse ID, Healthcard #, Doctor ID, Hospital ID }

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2NF: All non-primary attributes are dependent on the primary key. The table does not have a primary key which contains values >1 therefore partial dependencies do not exist.

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Therefore, **this table is in 3NF.**

Invoice FDs:

	INVOICE_NO	MEDICINE_ID	DATE_ISSUED	AMOUNT_OWED	APPOINTMENT_ID	HOSPITAL_ID
1	111112	3	20-10-20	100	10012	123
2	111113	3	20-10-22	10	10013	124

Invoice # → { Medicine ID, Date Issued, Appointment ID, Amount Owed, Health Card # }

Invoice # → Hospital ID

Invoice # → Healthcard #

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2NF: All non-primary attributes are dependent on the primary key. The table does not have a primary key which contains values >1 therefore partial dependencies do not exist.

3NF: All non-primary attributes are determined Only by the primary key in the table therefore transitive dependencies do not exist

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Diagnosis FDs:

	DIAGNOSIS_ID	RESULTS	APPOINTMENT_ID
1	123456	Stomach cancer	10012
2	123457	Covid-19	10013

Diagnosis ID → { Results, Appointment ID }

1NF: This table has no multivalued (atomic values) attributes or nested relations, all entries in column are the same type and unique column identifiers are used.

2NF: All non-primary attributes are dependent on the primary key. The table does not have a primary key which contains values >1 therefore partial dependencies do not exist.

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Therefore, **this table is in 3NF.**

Prescription FDs:

PRESCRIPTION_NO	DATE_ISSUED	APPOINTMENT_ID	MEDICINE_ID	DIAGNOSIS_ID
1231231	20-10-20	10012	191919	123456
1231232	20-10-22	10013	191919	123457
1231233	20-10-22	10013	191920	123457

Prescription # → { Date Issued, Medicine ID, Diagnosis ID, Appointment ID }
Prescription # → Diagnosis ID

1NF: This table has no multivalued (atomic values) attributes or nested relations, all entries in column are the same type and unique column identifiers are used.

2NF: This table contains a composite key but a partial dependency does not exists because all the non-primary attributes are dependent on the composite key.

3NF: All non-primary attributes are determined Only by the primary key in the table therefore transitive dependencies do not exist

Therefore, **this table is in 3NF.**

Medical History:

	HEALTHCARD_NO	APPOINTMENT_ID	DIAGNOSIS_ID	MEDICAL_DESC
1	1234567897	10012	123456	This guy has stomach cancer, he is allergic to tylonel so prescribe him something else
2	1234567892	10013	123457	Make sure they stay at home for two weeks

Healthcard # → { Diagnosis ID, Medical Description }

Appointment ID→ { Healthcard #, Diagnosis ID, Medical Description }

Diagnosis ID → { Healthcard #, Appointment ID, Medical Description }

Appointment ID → Diagnosis ID

1NF: This table has no multivalued (atomic values) attributes or nested relations, all entries in column are the same type and unique column identifiers are used.

2NF: This table contains a composite key but a partial dependency does not exist because all the non-primary attributes are dependent on the composite key.

3NF: All non-primary attributes are determined Only by the primary key in the table therefore transitive dependencies do not exist

Therefore, **this table is in 3NF.**

Medicine:

MEDICINE_ID	DOSAGE	IUPAC_NAME	GENERIC_NAME	INVENTORY	PRICE	EXPIRATION_DATE	MANUFACTURER	HOSPITAL_ID
191919	20	N-(4-hydroxyphenyl)acetamide	acetaminophen	500	5	30-01-01	Tylenol	123
191920	100	8-Chloro-1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine	alprazolam	200	50	20-12-25	Tylenol	123
191921	10	(S,S)-2-methylamino-1-phenylpropan-1-ol	pseudoephedrine	100	50	30-10-22	Johnson and Johnson	123
191922	50	(S)-2-Amino-3-[4-(4-hydroxy-3,5-diiodophenoxy)-3,5-diiodophenyl]propanoic acid	synthroid	50	25.5	29-06-01	Johnson and Johnson	123
191923	50	(3R,5R)-7-[2-(4-Fluorophenyl)-3-phenyl-4-(phenylcarbamoyl)-5-propan-2-ylpyrrol-1-yl]-3,5-dihydroxyheptanoic acid	lipitor	200	60	20-12-01	Johnson and Johnson	123
191924	75	(S,S)-2-methylamino-1-phenylpropan-1-ol	pseudoephedrine	100	48.75	29-05-02	Sinopharm	123
191925	125	(3R,5R)-7-[2-(4-Fluorophenyl)-3-phenyl-4-(phenylcarbamoyl)-5-propan-2-ylpyrrol-1-yl]-3,5-dihydroxyheptanoic acid	lipitor	1200	62.5	27-12-01	Sinopharm	123

Medicine ID → { IUPAC Name, Generic Name,Expiration Date }

Medicine ID → Hospital ID → { Inventory, Price }

1NF: This table has no multivalued (atomic values) attributes or nested relations, all entries in column are the same type and unique column identifiers are used.

2NF: This table does not have a primary key which contains >1 value therefore partial dependencies do not exist.

3NF: We have no transitive dependencies in this table.

Therefore, **this table is in 3NF.**