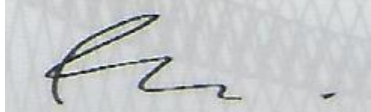


### Assignment Declaration

By submitting this assignment, I am aware of the University rule that a student must not act in a manner which constitutes academic dishonesty as stated and explained in the QUT Manual of Policies and Procedures. I confirm that this work represents my individual/our team's effort. I have viewed the final version and declare that it does not contain plagiarized material.

Full Name	Student No.	Signature
Ryan Hafizh Indrananda	10852565	

## TASK 4 – NORMALISATION

Functional Dependences:

- (FD) PROD\_NUM → PROD\_DESCRIPTION
- (FD) PROD\_NUM → PROD\_PRICE
- (FD) VEND\_CODE → VEND\_NAME

For our purposes, the current table is already in 1NF.

Decomposing the current table into 2NF:

<u>INV_NUM</u>	<u>PROD_NUM</u>	SALE_DATE	PROD_DESCRIPTION	VEND_CODE	VEND_NAME	NUMBER_SOLD	PROD_PRICE
211347	AA-E342	15-JAN-21	Rotary Sander	211	NF, Inc.	1	\$49.95
211347	QD-30093	15-JAN-21	0.25-in drill bit	211	NF, Inc.	8	\$3.45
211347	RU-99574	15-JAN-21	Band Saw	309	BGood, Inc.	1	\$39.99
211348	AA-E342	15-JAN-21	Rotary Sander	211	NF, Inc.	2	\$49.95
211349	GH-77834	16-JAN-21	Power Drill	157	TGo, Inc.	1	\$87.74

Product Table

<u>PROD_NUM</u>	PROD_DESCRIPTION	PROD_PRICE
AA-E342	Rotary Sander	\$49.95
QD-30093	0.25-in drill bit	\$3.45
RU-99574	Band Saw	\$39.99
AA-E342	Rotary Sander	\$49.95
GH-77834	Power Drill	\$87.74

2NF Table

<u>INV_NUM</u>	<u>PROD_NUM</u>	VEND_CODE	VEND_NAME	SALE_DATE	NUMBER_SOLD
211347	AA-E342	211	NF, Inc.	15-JAN-21	1
211347	QD-30093	211	NF, Inc.	15-JAN-21	8
211347	RU-99574	309	BGood, Inc.	15-JAN-21	1
211348	AA-E342	211	NF, Inc.	15-JAN-21	2
211349	GH-77834	157	TGo, Inc.	16-JAN-21	1

From the above 2NF table, we can see that VEND\_NAME is transitively dependent on VEND\_CODE. To amend this, we can further decompose said table to 3NF:

Vendor Table

<u>VEND_CODE</u>	VEND_NAME
211	NF, Inc.
211	NF, Inc.
309	BGood, Inc.
211	NF, Inc.
157	TGo, Inc.

3NF Table

<u>INV_NUM</u>	<u>PROD_NUM</u>	VEND_CODE	SALE_DATE	NUMBER_SOLD
211347	AA-E342	211	15-JAN-21	1
211347	QD-30093	211	15-JAN-21	8
211347	RU-99574	309	15-JAN-21	1
211348	AA-E342	211	15-JAN-21	2
211349	GH-77834	157	16-JAN-21	1

Relational Map:

**3NF** (INV\_NUM, PROD\_NUM, VEND\_CODE, SALE\_DATE, NUMBER\_SOLD)

**Vendor** (VEND\_CODE, VEND\_NAME)

Foreign Keys:

Vendor (VEND\_CODE) is dependent on 3NF (VEND\_CODE)

## TASK 5 – ANALYSIS OF CLIENT BRIEF

Databases play an important role within any university, such as in QUT. It provides a complete, relevant management system of data and information needed for the operations and activities within the organisation. This includes the management of student information such as names, email addresses, attendance, assignments, and more. Administrators and teaching staff who may wish to access a student's information may easily access a database through a safe authentication method, enforced to maintain integrity. Operations such as the handling of a new inflow of students can be done much easier and kept efficiently through a database than manually. Administrators may quickly insert new tuples into existing databases to form a concise collection of relevant information in one space rather than multiple. It is also cheaper to maintain than paper methods, enabling the university to allocate finances into other facilities. Databases are safer and more secure than paper methods as well. As mentioned before, the utilization of an authentication method ensures the identity of an administrator, ensuring that only select users can read and write data within the database. Data backups to ensure the atomicity of data is done much easier to do than manual methods, thus the chances of losing valuable pieces of information are greatly reduced.

Database security and privacy are greatly related to each other. The former relates to the protection of data from unwanted users and threats. Things such as unauthorized access and data breaches must be prevented by various methods such as firewalls and user authentication to ensure the safety of data within the database. The latter relates to how the sensitive data within the database is being used and ensuring that it is used responsibly. This would mean the assurance that relevant data within the database is used for relevant operations and used by relevant administration. What the database system and the university plans to do must be transparent with the user. The sharing of sensitive data to other organisations outside of the user's knowledge is indicative of a breach of privacy. Where the two concepts relate are clear: a possible breach of security would indefinitely lead to a breach of privacy, as unauthorized users are able to make use of sensitive data for any purpose outside of a stakeholder's interest, including students, teaching staff, and others who have sensitive data stored within the database. The university's methods of safety and security measures will not only protect the data, but also protect the identities of the stakeholders within it.