The following learning outcomes will be assessed:

1. Have a critical awareness of current problems and insights associated with modern secure database information systems development.
2. Show a comprehensive understanding of methodologies, tools, and technologies formanaging and developing secure database systems.

Important Information

You are required to submit your work within the bounds of the University Infringement of Assessment Regulations (see your Program Guide). Plagiarism, paraphrasing, and downloading large amounts of information from external sources, will not be tolerated and will be dealt with severely. Although you should make full use of any source material, which would normally be an occasional sentence and/or paragraph (referenced) followed by your own critical analysis/evaluation. You will receive no marks for work that is not your own. Your work may be subject to checks for originality which can include the use of an electronic plagiarismdetection service.

Where you are asked to submit an individual piece of work, the work must be entirely your own. The safety of your assessments is your responsibility. You must not permit another student access to your work.

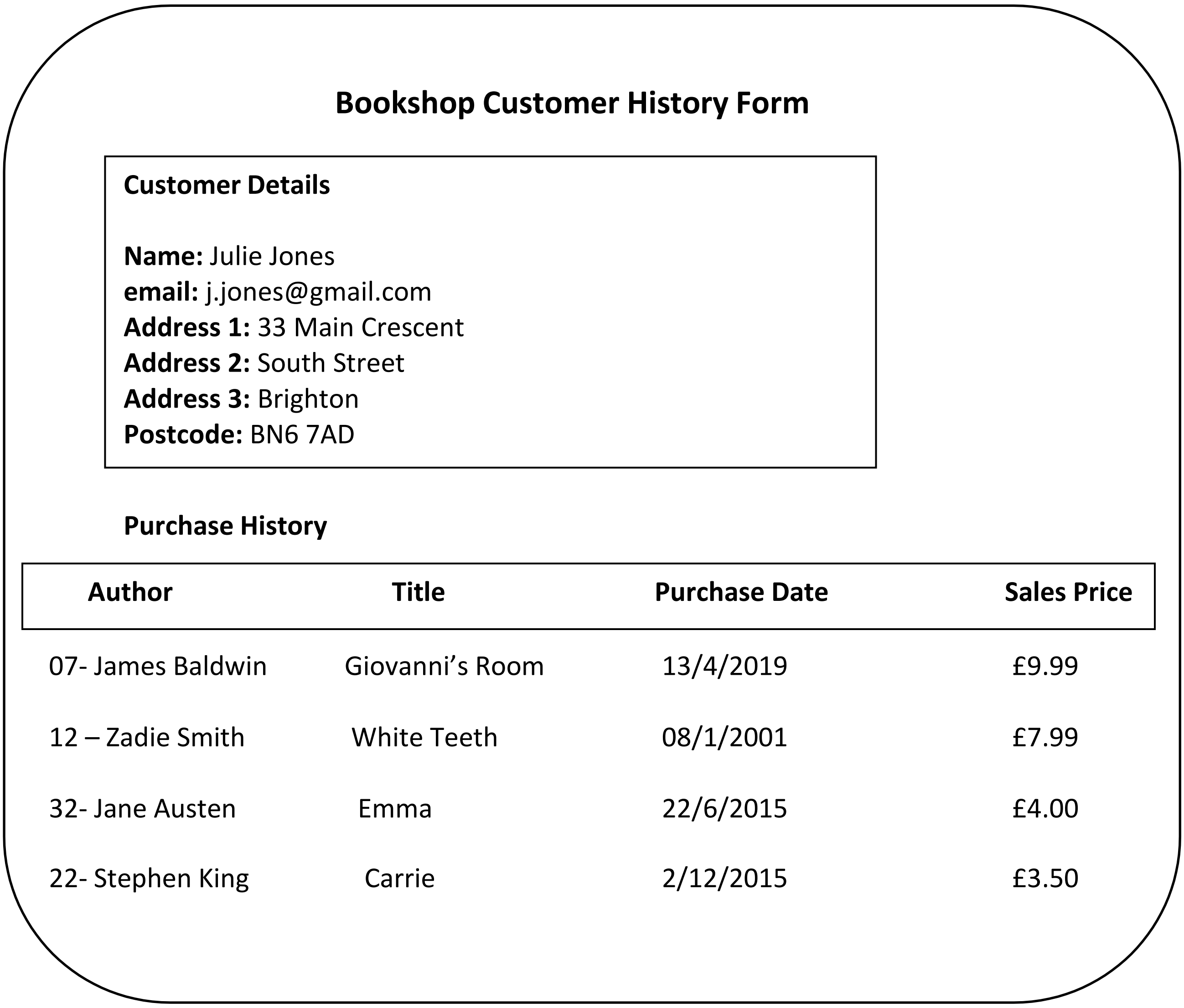
Where referencing is required, unless otherwise stated, the Harvard referencing system must be used (see your Program Guide).

Please ensure that you retain a duplicate of your assignment. We are required to send samples of student work to external examiners for moderation purposes. It will also safeguard you in the unlikely event of your work going astray.

Task 1: Smith and Co Second-Hand Bookshop

Scenario:
The Smith and Co second-hand bookshop wishes to maintain data on their customers, authors and books. They may have many books by each author in the bookshop at one time. Books may be bought and sold several times. In other words, as the bookshop is a second-hand store they may sell a book, then buy it back off the customer at a later date to sell on to another customer.

A sample customer history form can be seen below:



Bookshop Customer History Form

Customer Details

Name: Julie Jones
email: j.jones@gmail.com
Address 1: 33 Main Crescent
Address 2: South Street
Address 3: Brighton
Postcode: BN6 7AD

Purchase History

Author	Title	Purchase Date	Sales Price
07- James Baldwin	Giovanni's Room	13/4/2019	£9.99
12 – Zadie Smith	White Teeth	08/1/2001	£7.99
32- Jane Austen	Emma	22/6/2015	£4.00
22- Stephen King	Carrie	2/12/2015	£3.50

Requirements
Using normalization, produce a set of entities thinking carefully about the appropriate use ofentity and attribute names.

Normalization Table: produce a normalization table up to the Third Normal Form (3NF) of theproposed system. The normalization table should include the entities, attributes, and primary and foreign keys.

Use the example in Appendix 2 as a template for your normalization table.

Short Report: Write a report (of approximately 500 words) on any two potential database attacks which could occur on the Smith and Co Second-Hand bookshop database. For each attack:

- Include information relating to why the database might be a target for an attack,
- the type of attacks that may occur; and,
- the type of data that might be extracted from the system in each attack.

Remember to cite any resources using Harvard referencing.

Task 2: St. John's Hospital

Produce an E-R diagram and data dictionary for the following scenario. Ensure you think carefully about entity names and attribute names and data types.

Scenario:
Introduction

St John's hospital is updating its filing systems and wants to move its medical records within its hospital pharmacy to a computerized system to enable ease of use for staff and to modernize its old paper-based filing system. You have been tasked with developing a database application to meet their needs.

Current Position

Currently, St John's pharmacy record details of all patients (including their name, address, date of birth, ID number, and telephone number) they also store the prescription details for each patient (including the prescription number, the date prescribed, the name of the doctor who prescribed it, the name of the pharmacist who dispensed it and the issue date).

The pharmacy also needs to keep a record of their stock levels of drugs so that they can order more when stock becomes too low, this includes keeping a record of each drug, its name and item cost as well as the specific details of when this drug is prescribed and dispensed including the quantity prescribed and issued.

Entity-Relationship Diagram: Using an Entity-Relationship (E-R) diagram, produce a design of the proposed system, correctly showing labeled relationships with cardinality constraints clearly indicated, using the notation taught in the module. You do not need to show attributes on the diagram, only entity names. Ensure that you state clearly any assumptions that you have made in creating your Entity-Relationship Diagram.

Data Dictionary: Using a data dictionary, specify a set of tables and appropriate attributes for your design from the Entity-Relationship diagram above. For each table, your data dictionarymust specify:

- Table name.
- For each attribute, its name, description, and data type (using PostgreSQL data typesused in the SQL booklet for this module);
- Primary key and any foreign keys (ensure you specify which table each foreign keyrelates to);
- any further constraints on the data (e.g. business constraints on data values and dates;required format; and whether the attribute is null/not null).

Use the example in Appendix 1 as a template for your data dictionary.

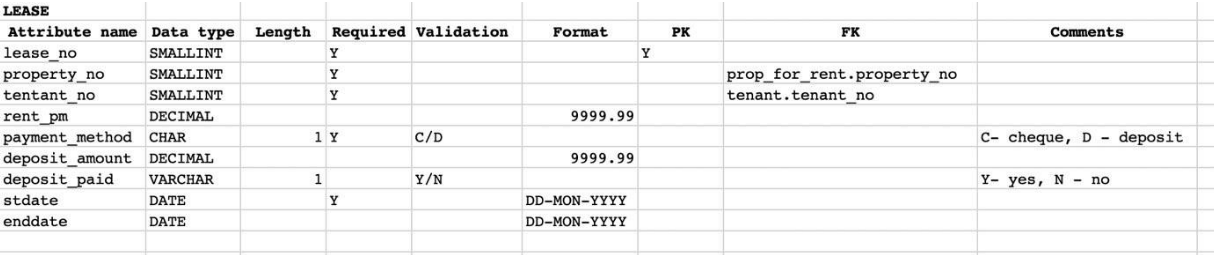
Submission:

You need to submit your normalization table and short report for **Task 1** and E-R diagramand data dictionary for **Task 2**.

The submission should be either a **Word or PDF file.**

APPENDIX 1 – Sample Data Dictionary

The following is a sample data dictionary for the LEASE table from the property for rent database that you have been using during the module. It shows how the data dictionary must be laid out for each table.



LEASE

Attribute name	Data type	Length	Required	Validation	Format	PK	FK	Comments
lease_no	SMALLINT		Y			Y		
property_no	SMALLINT		Y				prop_for_rent.property_no	
tentant_no	SMALLINT		Y				tenant.tenant_no	
rent_pm	DECIMAL				9999.99			
payment_method	CHAR	1	Y	C/D				C- cheque, D - deposit
deposit_amount	DECIMAL				9999.99			
deposit_paid	VARCHAR	1		Y/N				Y- yes, N - no
stdate	DATE		Y		DD-MON-YYYY			
enddate	DATE				DD-MON-YYYY			

Length is the maximum size permitted.
Required states 'Y' if the column is NOT NULL.
Validation states if there are any business constraints, e.g. the payment method can only be the character C or D.
Format specifies if there is any restriction on the format of the data, e.g. the rent_pm.
PK identifies attribute(s) which make up the primary key.
FK identifies whether an attribute is a primary key and indicates which table/attribute it relates to.
Comments are for any other relevant comments, e.g. to explain an attribute or validation constraints.

APPENDIX 2 – Sample Normalization Table

Unnormalized	UNF Level	1NF	2NF	3NF
Student no	1	Student no	Student no	Student no
Student name	1	Student name	Student name	Student name
Course code	1	Course code	Course code	*Course code
Course title	1	Course title	Course title	
Module code	2			Course code
Module name	2			Course title
No of students enrolled	2	Student no	Student no	
No of credits	2	Module code	Module code	
Result	2	Module name	Result	*Student no
		No of students enrolled		*Module code
		No of credits		Result
		Result	Module code	
			Module name	
			No of students enrolled	Module code
			No of credits	Module name
				No of students enrolled
				No of credits