Data Store Design and Implementation Distinction Project Report

Demonstration video link: https://www.youtube.com/watch?v=d5R_oq1NNoo

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0. Requirement overview

The following database implementation is designed to be used for a small start-up company selling beauty products. Moreover, this report presents how the database is designed using a UML diagram, showing the cardinality and relationship between tables. In addition, the database is tested to determine whether it fits the third normal form and altered if not. A video demonstrating and discussing is also included. Data storage solutions are given and discussed as well. Implementation of the database is done in phpMyadmin using SQL. All tables are created, where all primary and foreign keys are identified. Furthermore, queries are all tested, outputs are included in the report, and a description of their purpose and connection to the database implementation.

Data storage solution

The database solution presented in this report is for a small retail company named Beauty Co. (not a real company)- an Australian online cosmetic retailer startup. They sell cosmetics to customers who live in Australia. Due to its small size, the company is located in one building with 5 floors. Hence the company needs a place to keep all data from staff members and customers, thus having a database with 6 strong entries and 8 weak entities store the appropriate data, where now the company can access all necessary information.

Description of the Database usage

The database stores information within the company as well as its operations, including

- Employees' personal and contact information, as well as their work-related information.
- Information on departments and work positions within the company.
- Information on customers and suppliers, and retail and wholesale orders.
- can be used to calculate pay, and allocate work shifts.
- can be used to calculate order total and revenue and expenses within the company.
- can help identify trends in customers' shopping habits.

1. Identification of Entities and Assumptions:

1.1 Entries

Relation name	Explanation	Strong/weak	Attributes
Position	Name and information about a position at the company	Strong	position_id[PK] position_name employment_type hourly_salary
Staff	Personal detail and contact of staff member	Strong	staff_id[PK] staff_given_name staff_last_name staff_email staff_dob staff_phone_number
Salary	Information about an employee's salary	Weak	staff_id[PK][FK] salary_multiplier yearly_bonus
Staff_Position	Information about a staff member's current employment	Weak	staff_position_id[PK] staff_id[FK] position_id[FK] department_id[FK] manager_id[FK] start_date end_date
Shift_allocation	Information about an employee's shift	Weak	staff_position_id[PK][FK] start_time_date duration
Department	Information about a department of the company	Strong	department_id[PK] department_name building_floor phone_number
Product	information about a product	Strong	prod_id[PK] prod_name prod_type prod_unit prod_description prod_selling_unit_price
Stock_keeping	Stockkeeping at the headquarter	Weak	prod_id[PK][FK] quantity latest_update
Supplier	General information of a supplier	Strong	supp_id[PK] supp_name supp_address supp_email supp_phone
Stock_order	Contains information about an order from a supplier	Weak	stock_order_id [PK] stock_order_date supp_id[FK]

			stock_order_delivered
Stock_order_item	Individual item bought in a wholesale order	Weak	stock_order_id [PK][FK] prod_id[PK][FK] stock_order_item_quantity stock_order_item_unit_price
Customer	Information about a customer	Strong	cust_id [PK] cust_first_name cust_last_name cust_email cust_phone_number cust_delivery_address cust_billing_address
Cust_order	Contains information about customers order. This does not include information about individual items ordered.	Weak	cust_order_id [PK] cust_id[FK] cust_order_date cust_order_delivered
Cust_order_item	Information about a unique item in a customer's order.	Weak	order_id[PK][FK] prod_id[PK][FK] cust_order_item_quantity

1.2 Relations:

1 to 1	**1 to many**	**Many to Many**
Staff - Salary Product - Stock Keeping	Staff - Staff Position Customer - Customer Order Supplier - Supplier Order Department - Staff Position Position - Staff Position	Staff Position - Shift Allocation Product - Customer order Product - Stock Order

1.3 Assumptions

Staff and Staff_position table:

- A person can have only one position at a time but can have many entries in the Staff position table as their position change within the company. This of course can accommodate the change if the company allows an employee to work 2 positions.

Phone numbers:

- The company is based in Australia and therefore, we use 12 characters for all the fields with phone numbers.

Departments:

- Assume that 1 department can be fully accommodated on 1-floor.

Stock_order/ Customer_oder table:

- column stock_order_delivered/ customer_order_delivered: takes DateTime of the delivery, if not delivered yet then left null.
- All items within the order are delivered at the same time

Shift_allocation table:

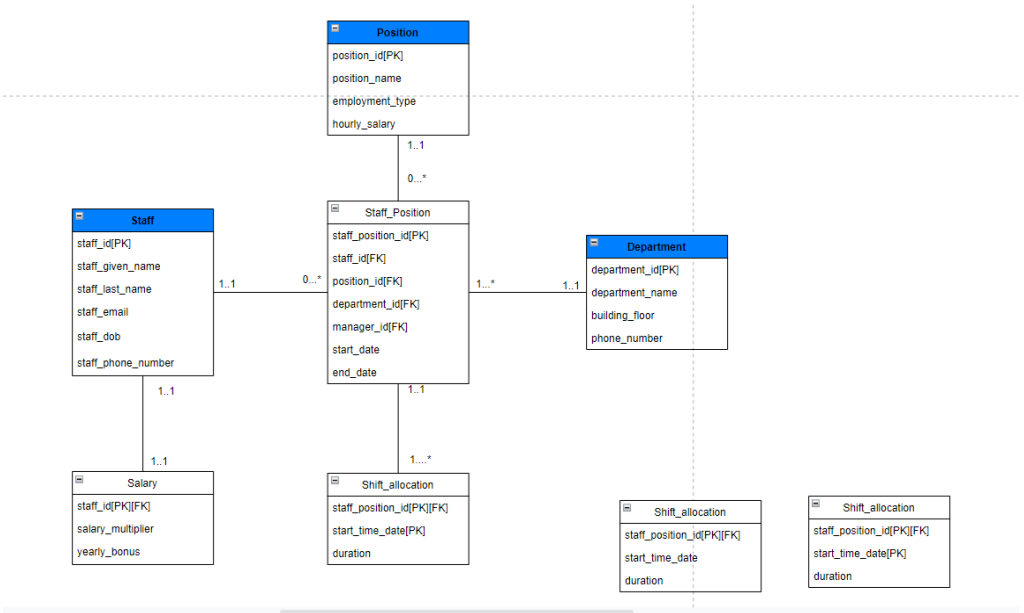
- Allocate a staff member to a certain time slot.

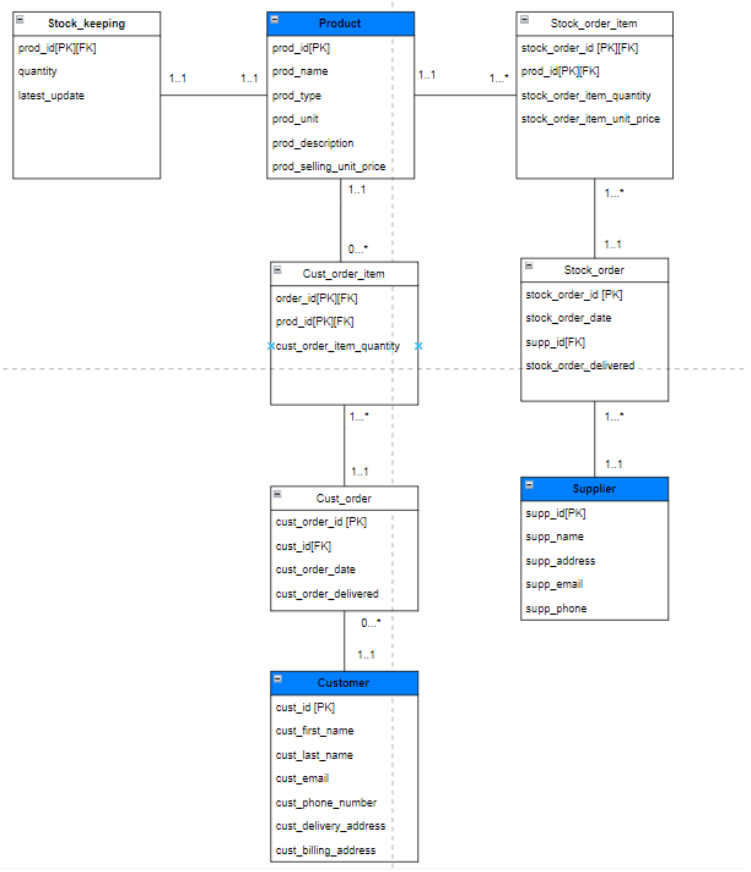
Staff_position table:

- A Position is not bound by a department. For example, there could be managers in every department, and designers could be in Marketing as well as Web Development. Rather, Staff_position will reference the department where the person works at.

2. Entity Relationship Design in UML

- All the entities and attribute names use snake case (underscore).
- Entities are capitalised in the first word. In most cases, the attributes are prefixed with parts of the table's name unless the attribute is referencing another table
- The strong entities are in blue.
- The weak entities are in white.



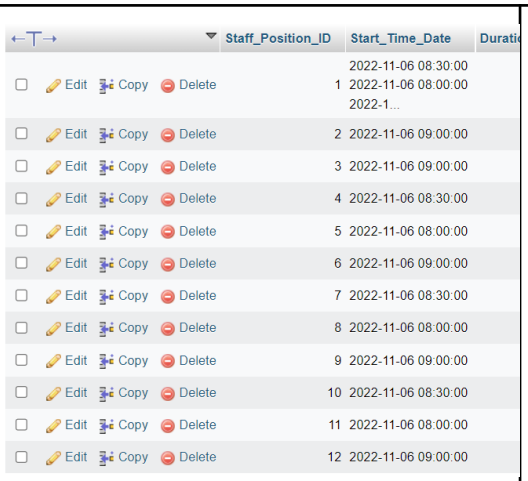
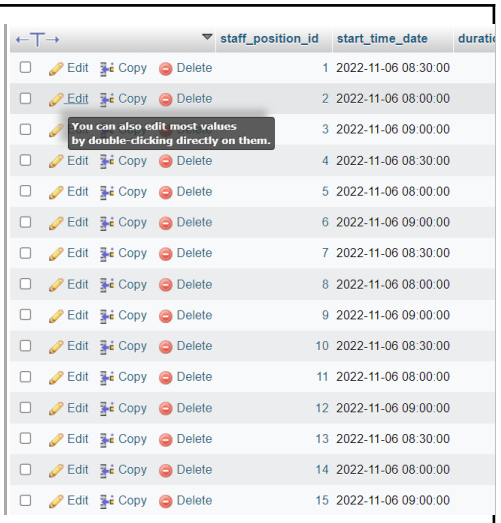
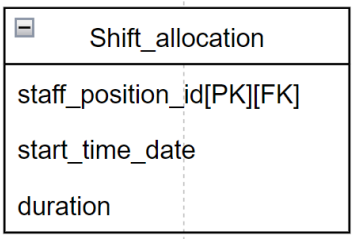
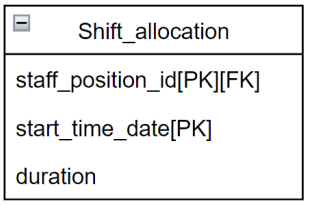


3. Test for Third normal form

All tables from the initial design have reached the third normal form except for 2 tables: Staff_allocation and Customer_order_item

Staff_allocation

	Before Normalisation	After Normalisation

Table		
UML		

First Normal Form:

First normal form is when entries in the table have single-value attributes. Therefore, there are multiple values in the start_time_date attribute for staff_position_id 1 with all having the same duration of 7 hours. This violates the first normal, as a relation has entries that are multi-value attributes.

Solution:

Is to separate tuples from tuples with staff_position_id 1 into respective staff_position_id 1, 2, 3 with all duration values of 7 hours. In addition, Staff_position_id and start_time_date are now used as Composite Primary Key

Second normal form:

A relation is considered to be in the second normal form when all attributes are atomic and only contain one data value hence the first normal form as well has no partial dependencies. These partial dependencies can be characterised as a non-key attribute dependent on one of the attributes which make up a composite primary key. This is satisfied by the staff_allocation table as duration is not dependent on either of the composite key attributes Hence in 2NF.

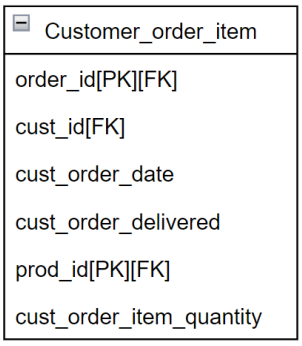
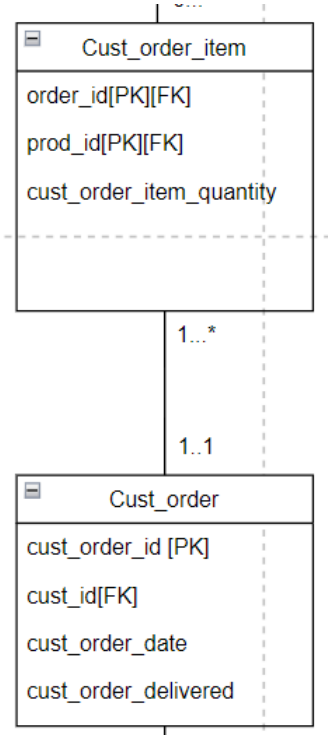
Third normal form:

For a relation to be the third normal form firstly the table has to be in the first and second normal form, in addition, must remove all transitive dependencies. Transitive dependencies are when attributes that are not the primary key define each other. This doesn't occur here as non of the attributes staff_position_id and start_time_date are not dependent on duration. Hence in 3NF.

Customer_order_item

prod_id	cust_order_item_quantity	cust_order_id	cust_id	cust_order_date	cust_order_delivered
AC0001	2	1	1	2022-11-04 15:33:42	NULL
CL0001	3	1	1	2022-11-04 15:33:42	NULL
LI0001	4	2	7	2022-11-04 15:33:42	NULL
SE0003	3	2	7	2022-11-04 15:33:42	NULL

Primary key: Prod_id and cust_order_id
First Normal Form: satisfied, no repeated rows
Second normal form: has not eliminated all [partial dependencies
Cust_order_date depends on cust_order_id but does not depend on prod_id, as the same products in the order are placed at the same time.
Cust_id also depends on cust_order_id, as the id of the customer remains the same throughout the order, no matter what product they add.
Third normal form: no transitive dependency is in this table.

<table>
<tr><th></th><th>Before Normalisation</th><th>After Normalisation</th></tr>
<tr><td>UML</td><td> 
</td><td> 
</td></tr>
<tr><td>Table</td><td>Customer_order_item
<table>
<tr><th>prod_id</th><th>cust_order_item_quantity</th><th>cust_order_id</th><th>cust_id</th><th>cust_order_date</th><th>cust_order_delivered</th></tr>
<tr><td>AC0001</td><td>2</td><td>1</td><td>1</td><td>2022-11-04 15:33:42</td><td>NULL</td></tr>
<tr><td>CL0001</td><td>3</td><td>1</td><td>1</td><td>2022-11-04 15:33:42</td><td>NULL</td></tr>
<tr><td>LI0001</td><td>4</td><td>2</td><td>7</td><td>2022-11-04 15:33:42</td><td>NULL</td></tr>
<tr><td>SE0003</td><td>3</td><td>2</td><td>7</td><td>2022-11-04 15:33:42</td><td>NULL</td></tr>
</table></td><td>Cust_order
<table>
<tr><th>cust_order_id</th><th>cust_id</th><th>cust_order_datetime</th><th>cust_order_delivered</th></tr>
<tr><td>1</td><td>1</td><td>2022-11-02 16:01:23</td><td>NULL</td></tr>
<tr><td>2</td><td>2</td><td>2022-11-02 16:01:51</td><td>NULL</td></tr>
</table>
Cust_order_item</td></tr>
</table>

		cust_order_id | prod_id | cust_order_item_quantity 1 | SE0001 | 2 1 | SE0002 | 3 2 | SE0001 | 4 2 | SE0002 | 6

4. Create Data for at least 25 Records in the largest table

1) Cust_order_item → weak entity

cust_order_id	prod_id	cust_order_item_quantity
1	SE0001	2
1	SE0002	3
2	SE0001	4
2	SE0002	6
3	AC0001	2
3	CL0001	3
3	LI0001	4
4	LI0001	2
4	LI0002	3
4	MO0001	3
4	PA0001	5
5	AC0001	1
5	CL0001	2
5	PA0001	6
6	AC0001	1
6	PA0002	2
6	SE0001	3
6	SE0003	1
7	AC0001	1
7	CL0001	1
7	LI0001	1
7	LI0002	1
7	PA0002	1
7	SE0003	1
8	MO0001	2

2) staff_allocation → weak entity

staff_position_id	staff_id	position_id	department_id	manager_id	start_date	end_date
1	AMB01	AA004	ACC04	AMK12	2020-01-21	2025-11-20
2	AMK12	AM004	ACC04	AMK12	2018-11-05	2027-09-22
3	ASB15	AT004	ACC04	AMK12	2020-10-22	2023-07-19
4	BES05	DA003	DES03	CEM03	2020-11-16	2025-09-27
5	CEM03	DM003	DES03	CEM03	2018-07-23	2027-10-22
6	DRV02	DT003	DES03	CEM03	2020-11-18	2027-10-15
7	GET08	MA001	MAR01	ISM07	2021-11-17	2025-10-25
8	ISM07	MM001	MAR01	ISM07	2018-09-15	2023-11-23
9	KAB10	MT001	MAR01	ISM07	2021-09-09	2023-11-02
10	KAN14	RA005	RES05	LIE11	2018-07-23	2026-11-20
11	LIE11	RM005	RES05	LIE11	2018-09-08	2026-09-18
12	MAC06	RT005	RES05	LIE11	2019-11-14	2025-11-14
13	OSW09	TA002	TES02	SEH04	2019-11-15	2024-11-15
14	SEH04	TM002	TES02	SEH04	2019-11-16	2027-11-16
15	WIH13	TT002	TES02	SEH04	2020-11-19	2025-11-19
16	ASB15	DT003	DES03	CEM03	2012-09-15	2020-10-22
17	DRV02	AT004	ACC04	AMK12	2013-09-15	2021-11-17
18	DRV02	MT001	MAR01	ISM07	2012-05-17	2013-05-17
19	KAB10	RT005	RES05	SEH04	2013-03-08	2021-09-09
20	MAC06	MT001	MAR01	ISM07	2013-06-20	2019-11-14
21	MAC06	TT002	TES02	SEH04	2012-07-23	2013-06-20
22	ISM07	DM003	DES03	CEM03	2015-09-11	2018-09-15
23	CEM03	MM001	MAR01	ISM07	2015-07-23	2018-07-23
24	SEH04	RM005	RES05	LIE11	2018-09-08	2019-11-16
25	LIE11	TM002	TES02	SEH04	2017-09-16	2018-09-08

5. Implementation of the Datastore on MySQL server

Customer

```
CREATE TABLE `customer` (
  `cust_id` int(8) UNSIGNED NOT NULL,
  `cust_first_name` varchar(32) NOT NULL,
  `cust_last_name` varchar(32) NOT NULL,
  `cust_dob` date NOT NULL,
  `cust_email` varchar(64) NOT NULL,
  `cust_phone_number` char(12) NOT NULL,
  `cust_delivery_address` varchar(256) NOT NULL,
  `cust_billing_address` varchar(256) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `customer`
```

```
  ADD PRIMARY KEY (`cust_id`);

ALTER TABLE `customer`
  MODIFY `cust_id` int(8) UNSIGNED NOT NULL AUTO_INCREMENT,
AUTO_INCREMENT=11;
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	cust_id	int(8)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	cust_first_name	varchar(32)	utf8mb4_general_ci		No	None			Change Drop More
3	cust_last_name	varchar(32)	utf8mb4_general_ci		No	None			Change Drop More
4	cust_dob	date			No	None			Change Drop More
5	cust_email	varchar(64)	utf8mb4_general_ci		No	None			Change Drop More
6	cust_phone_number	char(12)	utf8mb4_general_ci		No	None			Change Drop More
7	cust_delivery_address	varchar(256)	utf8mb4_general_ci		No	None			Change Drop More
8	cust_billing_address	varchar(256)	utf8mb4_general_ci		No	None			Change Drop More

Product

```
CREATE TABLE `product` (
  `prod_id` char(6) NOT NULL,
  `prod_name` varchar(64) NOT NULL,
  `prod_type` varchar(32) NOT NULL,
  `prod_unit` char(16) NOT NULL,
  `prod_description` varchar(128) DEFAULT NULL,
  `prod_selling_unit_price` decimal(6,2) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `product`
  ADD PRIMARY KEY (`prod_id`);
```

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
☐	1	prod_id	char(6)	utf8mb4_general_ci		No	None		
☐	2	prod_name	varchar(64)	utf8mb4_general_ci		No	None		
☐	3	prod_type	varchar(32)	utf8mb4_general_ci		No	None		
☐	4	prod_unit	char(16)	utf8mb4_general_ci		No	None		
☐	5	prod_description	varchar(128)	utf8mb4_general_ci		Yes	NULL		
☐	6	prod_selling_unit_price	decimal(6,2)			No	None		

Supplier

```
CREATE TABLE `supplier` (
  `supp_id` int(6) NOT NULL,
  `supp_name` varchar(64) NOT NULL,
  `supp_address` varchar(256) NOT NULL,
```

```
  `supp_email` varchar(64) NOT NULL,
  `supp_phone` char(12) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `supplier`
  ADD PRIMARY KEY (`supp_id`);

ALTER TABLE `supplier`
  MODIFY `supp_id` int(6) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=9;
```

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
☐	1	supp_id 🔑	int(6)			No	*None*		AUTO_INCREMENT
☐	2	supp_name	varchar(64)	utf8mb4_general_ci		No	*None*		
☐	3	supp_address	varchar(256)	utf8mb4_general_ci		No	*None*		
☐	4	supp_email	varchar(64)	utf8mb4_general_ci		No	*None*		
☐	5	supp_phone	char(12)	utf8mb4_general_ci		No	*None*		

Cust_order

```
CREATE TABLE `cust_order` (
  `cust_order_id` int(10) UNSIGNED NOT NULL,
  `cust_id` int(8) UNSIGNED NOT NULL,
  `cust_order_datetime` datetime NOT NULL DEFAULT current_timestamp(),
  `cust_order_delivered` datetime DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `cust_order`
  ADD PRIMARY KEY (`cust_order_id`),
  ADD KEY `cust_id` (`cust_id`);


ALTER TABLE `cust_order`
  MODIFY `cust_order_id` int(10) UNSIGNED NOT NULL AUTO_INCREMENT,
AUTO_INCREMENT=9;

ALTER TABLE `cust_order`
  ADD CONSTRAINT `cust_order_ibfk_1` FOREIGN KEY (`cust_id`) REFERENCES
`customer` (`cust_id`);
```

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
☐	1	cust_order_id 🔑	int(10)		UNSIGNED	No	*None*		AUTO_INCREMENT
☐	2	cust_id 🔑	int(8)		UNSIGNED	No	*None*		
☐	3	cust_order_datetime	datetime			No	current_timestamp()		
☐	4	cust_order_delivered	datetime			Yes	*NULL*		

Cust_order_item

```
CREATE TABLE `cust_order_item` (
  `cust_order_id` int(10) UNSIGNED NOT NULL,
  `prod_id` char(6) NOT NULL,
  `cust_order_item_quantity` int(8) UNSIGNED NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `cust_order_item`
  ADD PRIMARY KEY (`cust_order_id`,`prod_id`),
  ADD KEY `prod_id` (`prod_id`),
  ADD KEY `cust_order_id` (`cust_order_id`);

ALTER TABLE `cust_order_item`
  ADD CONSTRAINT `cust_order_item_ibfk_1` FOREIGN KEY (`cust_order_id`)
REFERENCES `cust_order` (`cust_order_id`),
  ADD CONSTRAINT `cust_order_item_ibfk_2` FOREIGN KEY (`prod_id`)
REFERENCES `product` (`prod_id`);
```

cust_order_id	cust_id	cust_order_datetime	cust_order_delivered
1	1	2022-11-02 16:01:23	*NULL*
2	2	2022-11-02 16:01:51	*NULL*
3	3	2022-11-04 13:30:33	*NULL*
4	4	2022-09-15 14:30:33	*NULL*
5	5	2022-11-01 14:30:33	*NULL*
6	6	2022-11-02 14:30:33	*NULL*
7	7	2022-11-01 14:30:33	*NULL*
8	7	2022-11-02 14:30:33	*NULL*

stock_keeping

```
CREATE TABLE `stock_keeping` (
  `prod_id` char(6) NOT NULL,
  `quantity` int(8) UNSIGNED NOT NULL,
  `latest_update` datetime NOT NULL DEFAULT current_timestamp()
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `stock_keeping`
  ADD PRIMARY KEY (`prod_id`),
  ADD KEY `prod_id` (`prod_id`);
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	prod_id	char(6)	utf8mb4_general_ci		No	*None*		
2	quantity	int(8)		UNSIGNED	No	*None*		
3	latest_update	datetime			No	current_timestamp()		

Stock_order

```
CREATE TABLE `stock_order` (
  `stock_order_id` int(10) UNSIGNED NOT NULL,
  `stock_order_date` datetime NOT NULL DEFAULT current_timestamp(),
  `supp_id` int(5) NOT NULL,
  `stock_order_delivered` datetime DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;


ALTER TABLE `stock_order`
  MODIFY `stock_order_id` int(10) UNSIGNED NOT NULL AUTO_INCREMENT,
AUTO_INCREMENT=8;


ALTER TABLE `stock_order`
  ADD PRIMARY KEY (`stock_order_id`),
  ADD KEY `supp_id` (`supp_id`);
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	stock_order_id	int(10)		UNSIGNED	No	*None*		AUTO_INCREMENT
2	stock_order_date	datetime			No	current_timestamp()		
3	supp_id	int(5)			No	*None*		
4	stock_order_delivered	datetime			Yes	*NULL*		

Stock_order_item

```
CREATE TABLE `stock_order_item` (
  `stock_order_id` int(10) UNSIGNED NOT NULL,
  `prod_id` char(6) NOT NULL,
  `stock_order_item_quantity` int(6) UNSIGNED NOT NULL,
  `stock_order_item_unit_price` decimal(8,2) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `stock_order_item`
  ADD PRIMARY KEY (`stock_order_id`,`prod_id`),
  ADD KEY `prod_id` (`prod_id`),
  ADD KEY `stock_order_id` (`stock_order_id`);
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	stock_order_id	int(10)		UNSIGNED	No	None		
2	prod_id	char(6)	utf8mb4_general_ci		No	None		
3	stock_order_item_quantity	int(6)		UNSIGNED	No	None		
4	stock_order_item_unit_price	decimal(8,2)			No	None		

staff

```
CREATE TABLE `staff` (
  `staff_id` char(5) NOT NULL,
  `staff_given_name` varchar(32) NOT NULL,
  `staff_last_name` varchar(32) NOT NULL,
  `staff_address` varchar(256) NOT NULL,
  `staff_email` varchar(64) NOT NULL,
  `staff_dob` date NOT NULL,
  `staff_phone_number` char(12) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `staff`
  ADD PRIMARY KEY (`staff_id`);
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	staff_id	char(5)	utf8mb4_general_ci		No	None		
2	staff_given_name	varchar(32)	utf8mb4_general_ci		No	None		
3	staff_last_name	varchar(32)	utf8mb4_general_ci		No	None		
4	staff_address	varchar(256)	utf8mb4_general_ci		No	None		
5	staff_email	varchar(64)	utf8mb4_general_ci		No	None		
6	staff_dob	date			No	None		
7	staff_phone_number	char(12)	utf8mb4_general_ci		No	None		

Department

```
CREATE TABLE `department` (
  `department_id` char(5) NOT NULL,
  `department_name` varchar(32) NOT NULL,
  `building_floor` int(2) NOT NULL,
  `department_phone_number` char(12) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `department`
  ADD PRIMARY KEY (`department_id`);
```

department_id	department_name	building_floor	department_phone_number
ACC04	Account department	4	0973886321
DES03	Product design department	3	0931245667
MAR01	Marketing department	1	0911456963
RES05	Research department	5	0966483427
TES02	Product testing department	2	0922393675

Position

```
CREATE TABLE `position` (
  `position_id` char(5) NOT NULL,
  `position_name` varchar(30) NOT NULL,
  `employment_type` varchar(9) NOT NULL,
  `hourly_salary` decimal(7,2) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `position`
  ADD PRIMARY KEY (`position_id`);
```

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
☐	1	position_id 🔑	char(5)	utf8mb4_general_ci		No	None		
☐	2	position_name	varchar(30)	utf8mb4_general_ci		No	None		
☐	3	employment_type	varchar(9)	utf8mb4_general_ci		No	None		
☐	4	hourly_salary	decimal(7,2)			No	None		

Salary

```
CREATE TABLE `salary` (
  `staff_id` char(5) NOT NULL,
  `salary_multiplier` decimal(4,2) NOT NULL,
  `yearly_bonus` decimal(7,2) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `salary`
  ADD PRIMARY KEY (`staff_id`) USING BTREE,
  ADD KEY `staff_id` (`staff_id`);

ALTER TABLE `salary`
  ADD CONSTRAINT `salary` FOREIGN KEY (`staff_id`) REFERENCES `staff`
(`staff_id`);
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	staff_id	char(5)	utf8mb4_general_ci		No	None		
2	salary_multiplier	decimal(4,2)			No	None		
3	yearly_bonus	decimal(7,2)			No	None		

Shift_allocation

```
CREATE TABLE `shift_allocation` (
  `staff_position_id` int(2) NOT NULL,
  `start_time_date` datetime NOT NULL,
  `duration` int(2) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `shift_allocation`
  ADD PRIMARY KEY (`staff_position_id`,`start_time_date`),
  ADD KEY `staff_position_id` (`staff_position_id`);

ALTER TABLE `shift_allocation`
  ADD CONSTRAINT `shift_allocation_ibfk_1` FOREIGN KEY
(`staff_position_id`) REFERENCES `staff_position`
(`staff_position_id`);
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	staff_position_id	int(2)			No	None		
2	start_time_date	datetime			No	None		
3	duration	int(2)			No	None		

Staff_position

```
CREATE TABLE `staff_position` (
  `staff_position_id` int(2) NOT NULL,
  `staff_id` char(5) NOT NULL,
  `position_id` char(5) NOT NULL,
  `department_id` char(5) NOT NULL,
  `manager_id` char(5) DEFAULT NULL,
  `start_date` date DEFAULT current_timestamp(),
  `end_date` date NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

ALTER TABLE `staff_position`
  ADD PRIMARY KEY (`staff_position_id`),
  ADD KEY `position_id` (`position_id`),
  ADD KEY `department_id` (`department_id`),
  ADD KEY `staff_id` (`staff_id`,`position_id`,`department_id`),
```

```
  ADD KEY `manager_id` (`manager_id`);


ALTER TABLE `staff_position`
  ADD CONSTRAINT `staff_position_ibfk_1` FOREIGN KEY (`staff_id`)
REFERENCES `staff` (`staff_id`),
  ADD CONSTRAINT `staff_position_ibfk_2` FOREIGN KEY (`position_id`)
REFERENCES `position` (`position_id`),
  ADD CONSTRAINT `staff_position_ibfk_3` FOREIGN KEY (`department_id`)
REFERENCES `department` (`department_id`),
  ADD CONSTRAINT `staff_position_ibfk_4` FOREIGN KEY (`manager_id`)
REFERENCES `staff` (`staff_id`);
COMMIT;
```

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
☐	1	staff_position_id	int(2)			No	*None*		
☐	2	start_time_date	datetime			No	*None*		
☐	3	duration	int(2)			No	*None*		

Table	Action	Rows	Type	Collation	Size	Overhead
customer	Browse Structure Search Insert Empty Drop	10	InnoDB	utf8mb4_general_ci	32.0 KiB	-
customer_order_item	Browse Structure Search Insert Empty Drop	4	InnoDB	utf8mb4_general_ci	48.0 KiB	-
cust_order	Browse Structure Search Insert Empty Drop	8	InnoDB	utf8mb4_general_ci	32.0 KiB	-
cust_order_item	Browse Structure Search Insert Empty Drop	29	InnoDB	utf8mb4_general_ci	48.0 KiB	-
department	Browse Structure Search Insert Empty Drop	5	InnoDB	utf8mb4_general_ci	16.0 KiB	-
position	Browse Structure Search Insert Empty Drop	15	InnoDB	utf8mb4_general_ci	16.0 KiB	-
product	Browse Structure Search Insert Empty Drop	10	InnoDB	utf8mb4_general_ci	16.0 KiB	-
salary	Browse Structure Search Insert Empty Drop	15	InnoDB	utf8mb4_general_ci	32.0 KiB	-
shift_allocation	Browse Structure Search Insert Empty Drop	15	InnoDB	utf8mb4_general_ci	32.0 KiB	-
staff	Browse Structure Search Insert Empty Drop	15	InnoDB	utf8mb4_general_ci	16.0 KiB	-
staff_position	Browse Structure Search Insert Empty Drop	25	InnoDB	utf8mb4_general_ci	80.0 KiB	-
stock_keeping	Browse Structure Search Insert Empty Drop	10	InnoDB	utf8mb4_general_ci	32.0 KiB	-
stock_order	Browse Structure Search Insert Empty Drop	7	InnoDB	utf8mb4_general_ci	32.0 KiB	-
stock_order_item	Browse Structure Search Insert Empty Drop	14	InnoDB	utf8mb4_general_ci	48.0 KiB	-
supplier	Browse Structure Search Insert Empty Drop	7	InnoDB	utf8mb4_general_ci	16.0 KiB	-
15 tables	Sum	189	InnoDB	utf8mb4_general_ci	496.0 KiB	0 B

Customer

```
INSERT INTO `customer` (`cust_id`, `cust_first_name`, `cust_last_name`,
`cust_dob`, `cust_email`, `cust_phone_number`, `cust_delivery_address`,
`cust_billing_address`) VALUES
(1, 'Jane', 'Goodall', '1984-01-14', 'jgoodall@jane.mail.com',
'+61424999888', '51 McLaughlin Road, West Amberley, Queensland, 4306',
'51 McLaughlin Road, West Amberley, Queensland, 4306'),
(2, 'Tiffany', 'Pollard', '1990-01-01', 'hbic@hotmail.com',
'+61745998844', '15 Bayview Road, Coolillie, South Australia, 5670',
'15 Bayview Road, Coolillie, South Australia, 5670'),
```

```
(3, 'Nirmala', 'Salvatici', '1999-11-12', 'nsalvatici@gmail.com',
'+61424999666', '88 Eurack Court, Boorowa, New South Wales 2586', '76
Boonah Qld, Cooeeimbardi, Queensland 4313'),
(4, 'Toribio', 'Dirix', '1995-10-10', 'tdirix@yahoo.com',
'+61745470961', '26 Commercial Street, Carlsruhe,  Victoria 3442', '26
Commercial Street, Carlsruhe,  Victoria 3442'),
(5, 'Arin', 'Hogarth', '1988-10-09', 'ahorgarth@yahoo.com',
'+61883716148', '98 Cecil Street, Cheltenham, New South Wales 2119',
'98 Cecil Street, Cheltenham, New South Wales 2119'),
(6, 'Kayden', 'Marlow', '1972-03-27', 'kmarloww@yahoo.com',
'+61887347731', '77 Flinstone Drive, Interlaken, Tasmania 7030', '98
Cecil Street, Interlaken, Tasmania 7030'),
(7, 'Hunter', 'Reyer', '1987-12-25', 'hreyer87@yahoo.com',
'+61353585141', '68 Dalgarno Street, Rangari, New South Wales 2380',
'68 Dalgarno Street, Rangari, New South Wales 2380'),
(8, 'Adelaide', 'Bergmann', '1968-11-06', 'abergmann@yahoo.com',
'+61883613806', '19 Hodgson St, Swan Creek, Queensland 4370', '20
Brentwood Drive, Lakefield, Queensland 4871'),
(9, 'Tawnya', 'Ayers', '1986-09-08', 'tayers@yahoo.com',
'+61261588925', '49 Garden Place, Richmond Plains, Victoria 3518', '49
Garden Place, Richmond Plains, Victoria 3518'),
(10, 'Thao', 'Vo', '1958-08-20', 'thaovo@gmail.com', '+61753030079',
'30 Moruya Road, Farringdon, New South Wales  2622', '30 Moruya Road,
Farringdon, New South Wales  2622');
```

cust_id	cust_first_name	cust_last_name	cust_dob	cust_email	cust_phone_number	cust_delivery_address	cust_billing_address
1	Jane	Goodall	1984-01-14	jgoodall@jane.mail.com	+61424999888	51 McLaughlin Road, West Amberley, Queensland, 430...	51 McLaughlin Road, West Amberley, Queensland, 430...
2	Tiffany	Pollard	1990-01-01	hbic@hotmail.com	+61745998844	15 Bayview Road, Coolillie, South Australia, 5670	15 Bayview Road, Coolillie, South Australia, 5670
3	Nirmala	Salvatici	1999-11-12	nsalvatici@gmail.com	+61424999666	88 Eurack Court, Boorowa, New South Wales 2586	76 Boonah Qld, Cooeeimbardi, Queensland 4313
4	Toribio	Dirix	1995-10-10	tdirix@yahoo.com	+61745470961	26 Commercial Street, Carlsruhe, Victoria 3442	26 Commercial Street, Carlsruhe, Victoria 3442
5	Arin	Hogarth	1988-10-09	ahorgarth@yahoo.com	+61883716148	98 Cecil Street, Cheltenham, New South Wales 2119	98 Cecil Street, Cheltenham, New South Wales 2119
6	Kayden	Marlow	1972-03-27	kmarloww@yahoo.com	+61887347731	77 Flinstone Drive, Interlaken, Tasmania 7030	98 Cecil Street, Interlaken, Tasmania 7030
7	Hunter	Reyer	1987-12-25	hreyer87@yahoo.com	+61353585141	68 Dalgarno Street, Rangari, New South Wales 2380	68 Dalgarno Street, Rangari, New South Wales 2380
8	Adelaide	Bergmann	1968-11-06	abergmann@yahoo.com	+61883613806	19 Hodgson St, Swan Creek, Queensland 4370	20 Brentwood Drive, Lakefield, Queensland 4871
9	Tawnya	Ayers	1986-09-08	tayers@yahoo.com	+61261588925	49 Garden Place, Richmond Plains, Victoria 3518	49 Garden Place, Richmond Plains, Victoria 3518
10	Thao	Vo	1958-08-20	thaovo@gmail.com	+61753030079	30 Moruya Road, Farringdon, New South Wales 2622	30 Moruya Road, Farringdon, New South Wales 2622

Product

```
INSERT INTO `product` (`prod_id`, `prod_name`, `prod_type`,
`prod_unit`, `prod_description`, `prod_selling_unit_price`) VALUES
('AC0001', '2% BHA Liquid Exfoliant', 'Acid', 'Bottle', 'Paula\'s
Choice Skin Perfecting 2% BHA Liquid Exfoliant', '10.00'),
('CL0001', 'Oat Cleansing Balm 150ml', 'Cleanser', 'Tube', 'The INKEY
List Oat Cleansing Balm 150ml', '8.79'),
('LI0001', 'Lanolips Strawberry Balm', 'Lip balm', 'Stick',
'LANOLIPS\r\nJellybalm Strawberry 10 g - Soft and Juicy', '14.99'),
('LI0002', 'BONDI SANDS SPF 50+ Lip Balm Coconut 10 g', 'Lip balm',
'Stick', 'Bondi Sands Coconut-flavoured lip balm restores dehydrated
lips with Vitamin E and provides SPF50+ protection from harsh UVA and',
'6.99'),
```

```
('MO0001', 'Squalane and Probiotic Gel Moisturizer', 'Mosturizer',
'Bottle', 'BIOSSANCE Squalane + Probiotic Gel Moisturizer - anti acne
and inflammation', '44.00'),
('PA0001', 'COSRX Acne Patch', 'Patch', 'Sheet', 'COSRX Acne Pimple
Master Patch - A.D.F. Hydrocolloid Dressing', '3.80'),
('PA0002', 'Skin Control Pimple Pack', 'Patch', 'Sheet', 'Skin Control
Pimple Patch PM Nightime Pack, 24 count', '5.04'),
('SE0001', 'The Ordinary Niacinamide', 'Serum', 'Bottle', 'The
Ordinary. Niacinamide 10% + Zinc 1%', '10.60'),
('SE0002', 'Skinceuticals Vitamin C', 'Serum', 'Bottle', 'C E Ferulic
Vitamin C Serum', '233.15'),
('SE0003', 'B5 Hyaluronic Acid Serum 30ml', 'Serum', 'Bottle', 'La
Roche-Posay Hyalu B5 Hyaluronic Acid Serum 30ml', '34.76');
```

prod_id	prod_name	prod_type	prod_unit	prod_description	prod_selling_unit_price
AC0001	2% BHA Liquid Exfoliant	Acid	Bottle	Paula's Choice Skin Perfecting 2% BHA Liquid Exfol...	10.00
CL0001	Oat Cleansing Balm 150ml	Cleanser	Tube	The INKEY List Oat Cleansing Balm 150ml	8.79
LI0001	Lanolips Strawberry Balm	Lip balm	Stick	LANOLIPS Jellybalm Strawberry 10 g - Soft and Jui...	14.99
LI0002	BONDI SANDS SPF 50+ Lip Balm Coconut 10 g	Lip balm	Stick	Bondi Sands Coconut-flavoured lip balm restores de...	6.99
MO0001	Squalane and Probiotic Gel Moisturizer	Mosturizer	Bottle	BIOSSANCE Squalane + Probiotic Gel Moisturizer - a...	44.00
PA0001	COSRX Acne Patch	Patch	Sheet	COSRX Acne Pimple Master Patch - A.D.F. Hydrocollo...	3.80
PA0002	Skin Control Pimple Pack	Patch	Sheet	Skin Control Pimple Patch PM Nightime Pack, 24 cou...	5.04
SE0001	The Ordinary Niacinamide	Serum	Bottle	The Ordinary. Niacinamide 10% + Zinc 1%	10.60
SE0002	Skinceuticals Vitamin C	Serum	Bottle	C E Ferulic Vitamin C Serum	233.15
SE0003	B5 Hyaluronic Acid Serum 30ml	Serum	Bottle	La Roche-Posay Hyalu B5 Hyaluronic Acid Serum 30ml	34.76

Supplier

```
INSERT INTO `supplier` (`supp_id`, `supp_name`, `supp_address`,
`supp_email`, `supp_phone`) VALUES
(1, 'L\'Oreal', '88 Tanner Street, Alloway, Queensland 4670\r\n',
'sales@loreal.com', '+61073179091'),
(3, 'Deciem', '48 Magnolia Drive, Mortdale, New South Wales 2223',
'skincare@deciem.com', '+61262194219'),
(4, 'Unilever', '6 Buoro Street, Seaforth,  Queensland 4741',
'wholesales@unilever.com', '+61749331668'),
(5, 'Estee Lauder Cosmetics', '13 Lowe Street, Jandowae, Queensland
4410', 'estee@esteelauder.com', '+61745058928'),
(6, 'Shiseido', '87 Romawi Road, Iguana Creek, Victoria 3875',
'face@shiseido.com', '+61353422156'),
(7, 'Beiersdorf', '31 Eurack Court, Tuena, New South Wales 2583',
'nivea@beiersdorf.com.au', '+61261976278'),
(8, 'Johnson and Johnson', '44 Ranworth Road, Darling Downs, Western
Australia 6122', 'jj@johnson.com', '+61267829763');
```

supp_id	supp_name	supp_address	supp_email	supp_phone
1	L'Oreal	88 Tanner Street, Alloway, Queensland 4670	sales@loreal.com	+61073179091
3	Deciem	48 Magnolia Drive, Mortdale, New South Wales 2223	skincare@deciem.com	+61262194219
4	Unilever	6 Buoro Street, Seaforth, Queensland 4741	wholesales@unilever.com	+61749331668
5	Estee Lauder Cosmetics	13 Lowe Street, Jandowae, Queensland 4410	estee@esteelauder.com	+61745058928
6	Shiseido	87 Romawi Road, Iguana Creek, Victoria 3875	face@shiseido.com	+61353422156
7	Beiersdorf	31 Eurack Court, Tuena, New South Wales 2583	nivea@beiersdorf.com.au	+61261976278
8	Johnson and Johnson	44 Ranworth Road, Darling Downs, Western Australia...	jj@johnson.com	+61267829763

Cust_order

```
INSERT INTO `cust_order` (`cust_order_id`, `cust_id`,
`cust_order_datetime`, `cust_order_delivered`) VALUES
(1, 1, '2022-11-02 16:01:23', NULL),
(2, 2, '2022-11-02 16:01:51', NULL),
(3, 3, '2022-11-04 13:30:33', NULL),
(4, 4, '2022-09-15 14:30:33', NULL),
(5, 5, '2022-11-01 14:30:33', NULL),
(6, 6, '2022-11-02 14:30:33', NULL),
(7, 7, '2022-11-01 14:30:33', NULL),
(8, 7, '2022-11-02 14:30:33', NULL);
```

cust_order_id	cust_id	cust_order_datetime	cust_order_delivered
1	1	2022-11-02 16:01:23	*NULL*
2	2	2022-11-02 16:01:51	*NULL*
3	3	2022-11-04 13:30:33	*NULL*
4	4	2022-09-15 14:30:33	*NULL*
5	5	2022-11-01 14:30:33	*NULL*
6	6	2022-11-02 14:30:33	*NULL*
7	7	2022-11-01 14:30:33	*NULL*
8	7	2022-11-02 14:30:33	*NULL*

Cust_order_item

```
INSERT INTO `cust_order_item` (`cust_order_id`, `prod_id`,
`cust_order_item_quantity`) VALUES
(1, 'SE0001', 2),
(1, 'SE0002', 3),
(2, 'SE0001', 4),
(2, 'SE0002', 6),
(3, 'AC0001', 2),
(3, 'CL0001', 3),
```

```
(3, 'LI0001', 4),
(4, 'LI0001', 2),
(4, 'LI0002', 3),
(4, 'MO0001', 3),
(4, 'PA0001', 5),
(5, 'AC0001', 1),
(5, 'CL0001', 2),
(5, 'PA0001', 6),
(6, 'AC0001', 1),
(6, 'PA0002', 2),
(6, 'SE0001', 3),
(6, 'SE0003', 1),
(7, 'AC0001', 1),
(7, 'CL0001', 1),
(7, 'LI0001', 1),
(7, 'LI0002', 1),
(7, 'PA0002', 1),
(7, 'SE0003', 1),
(8, 'MO0001', 2),
(8, 'PA0001', 3),
(8, 'PA0002', 3),
(8, 'SE0001', 3),
(8, 'SE0003', 4);
```

prod_id	cust_order_item_quantity	cust_order_id	cust_id	cust_order_date	cust_order_delivered
AC0001	2	1	1	2022-11-04 15:33:42	*NULL*
CL0001	3	1	1	2022-11-04 15:33:42	*NULL*
LI0001	4	2	7	2022-11-04 15:33:42	*NULL*
SE0003	3	2	7	2022-11-04 15:33:42	*NULL*

Stock_keeping

```
INSERT INTO `stock_keeping` (`prod_id`, `quantity`, `latest_update`)
VALUES
('AC0001', 1000, '2022-11-04 15:12:23'),
('CL0001', 2000, '2022-11-04 15:12:23'),
('LI0001', 3000, '2022-11-04 15:12:23'),
('LI0002', 100, '2022-11-04 15:12:23'),
('MO0001', 55, '2022-11-04 15:12:23'),
('PA0001', 40, '2022-11-04 15:12:23'),
('PA0002', 101, '2022-11-04 15:12:23'),
('SE0001', 1000, '2022-11-02 16:07:39'),
('SE0002', 2000, '2022-11-02 16:08:15'),
('SE0003', 11, '2022-11-04 15:12:23');
```

prod_id	quantity	latest_update
AC0001	1000	2022-11-04 15:12:23
CL0001	2000	2022-11-04 15:12:23
LI0001	3000	2022-11-04 15:12:23
LI0002	100	2022-11-04 15:12:23
MO0001	55	2022-11-04 15:12:23
PA0001	40	2022-11-04 15:12:23
PA0002	101	2022-11-04 15:12:23
SE0001	1000	2022-11-02 16:07:39
SE0002	2000	2022-11-02 16:08:15
SE0003	11	2022-11-04 15:12:23

Stock_order

```
INSERT INTO `stock_order` (`stock_order_id`, `stock_order_date`,
`supp_id`, `stock_order_delivered`) VALUES
(1, '2022-11-02 15:56:55', 1, NULL),
(2, '2022-11-02 15:57:41', 1, NULL),
(3, '2022-11-04 14:56:57', 4, NULL),
(4, '2022-11-04 14:56:57', 5, NULL),
(5, '2022-11-04 14:56:57', 6, NULL),
(6, '2022-11-04 14:56:57', 7, NULL),
(7, '2022-11-04 14:56:57', 8, NULL);
```

stock_order_id	stock_order_date	supp_id	stock_order_delivered
1	2022-11-02 15:56:55	1	*NULL*
2	2022-11-02 15:57:41	1	*NULL*
3	2022-11-04 14:56:57	4	*NULL*
4	2022-11-04 14:56:57	5	*NULL*
5	2022-11-04 14:56:57	6	*NULL*
6	2022-11-04 14:56:57	7	*NULL*
7	2022-11-04 14:56:57	8	*NULL*

Stock_order_item

```
INSERT INTO `stock_order_item` (`stock_order_id`, `prod_id`,
`stock_order_item_quantity`, `stock_order_item_unit_price`) VALUES
(1, 'SE0002', 2000, '250.50'),
(2, 'SE0001', 2500, '8.15'),
(3, 'AC0001', 1000, '8.05'),
(3, 'CL0001', 2000, '7.33'),
(3, 'LI0001', 2500, '10.33'),
(4, 'LI0001', 500, '9.95'),
(4, 'LI0002', 3000, '6.00'),
(5, 'MO0001', 500, '40.00'),
(6, 'PA0001', 500, '3.15'),
(6, 'PA0002', 1000, '4.60'),
(6, 'SE0001', 2000, '8.15'),
(7, 'AC0001', 1000, '8.15'),
(7, 'SE0002', 100, '215.95'),
(7, 'SE0003', 600, '30.15');
```

stock_order_id	prod_id	stock_order_item_quantity	stock_order_item_unit_price
1	SE0002	2000	250.50
2	SE0001	2500	8.15
3	AC0001	1000	8.05
3	CL0001	2000	7.33
3	LI0001	2500	10.33
4	LI0001	500	9.95
4	LI0002	3000	6.00
5	MO0001	500	40.00
6	PA0001	500	3.15
6	PA0002	1000	4.60
6	SE0001	2000	8.15
7	AC0001	1000	8.15
7	SE0002	100	215.95
7	SE0003	600	30.15

Department

```
INSERT INTO `department` (`department_id`, `department_name`,
`building_floor`, `department_phone_number`) VALUES
('ACC04', 'Account department', 4, '0973886321'),
('DES03', 'Product design department ', 3, '0931245667'),
('MAR01', 'Marketing department', 1, '0911456963'),
('RES05', 'Research department', 5, '0966483427'),
('TES02', 'Product testing department ', 2, '0922393675');
```

department_id	department_name	building_floor	department_phone_number
ACC04	Account department	4	0973886321
DES03	Product design department	3	0931245667
MAR01	Marketing department	1	0911456963
RES05	Research department	5	0966483427
TES02	Product testing department	2	0922393675

Position

```
INSERT INTO `position` (`position_id`, `position_name`,
`employment_type`, `hourly_salary`) VALUES
('AA004', 'Accounts assistant', 'Full time', '38.45'),
('AM004', 'Account Manager', 'Full time', '60.48'),
('AT004', 'Account Team member', 'Part time', '30.55'),
('DA003', 'Design Assistant', 'Full time', '36.38'),
('DM003', 'Design Manager', 'Full time', '56.74'),
('DT003', 'Design Team member ', 'Part time', '30.00'),
('MA001', 'Marketing Assistance ', 'Full time', '37.45'),
('MM001', 'Marketing Manager', 'Full time', '54.38'),
('MT001', 'Marketing Team member', 'Part time', '30.21'),
('RA005', 'Research Assistant', 'Full time', '38.45'),
('RM005', 'Research Manager', 'Full time', '58.48'),
('RT005', 'Research Team member', 'Part time', '31.55'),
('TA002', 'Testing Assistance', 'Full time', '39.45'),
('TM002', 'Testing Manager', 'Full time', '60.48'),
('TT002', 'Testing Team member', 'Part time', '32.45');
```

position_id	position_name	employment_type	hourly_salary
AA004	Accounts assistant	Full time	38.45
AM004	Account Manager	Full time	60.48
AT004	Account Team member	Part time	30.55
DA003	Design Assistant	Full time	36.38
DM003	Design Manager	Full time	56.74
DT003	Design Team member	Part time	30.00
MA001	Marketing Assistance	Full time	37.45
MM001	Marketing Manager	Full time	54.38
MT001	Marketing Team member	Part time	30.21
RA005	Research Assistant	Full time	38.45
RM005	Research Manager	Full time	58.48
RT005	Research Team member	Part time	31.55
TA002	Testing Assistance	Full time	39.45
TM002	Testing Manager	Full time	60.48
TT002	Testing Team member	Part time	32.45

Staff

```
INSERT INTO `staff` (`staff_id`, `staff_given_name`, `staff_last_name`,
`staff_address`, `staff_email`, `staff_dob`, `staff_phone_number`)
VALUES
('AMB01', 'Amy', 'Bell', '53 Mandible Street MOUNT EAST VIC 4825',
'Amy686@gmail.com', '1994-11-17', '0445083709'),
('AMK12', 'Amelia', 'Kleeberg', '31 Lapko Road BORDEN VIC 6338',
'Amelia443@gmail.com', '1992-11-19', '0490890229'),
('ASB15', 'Ashton', 'Bromley', '11 Girvan Grove EAGLEHAWK VIC 3556',
'AshtonGogo123@gmail.com', '1996-05-18', '0453170966'),
('BES05', 'Benjamin', ' Streeten', '93 Barker Street MARRACOONDA VIC
6317\r\n', 'BenjaminStreeten@rhyta.com', '1964-09-18', '0490764111'),
('CEM03', 'Cilka', 'Emlyn', '27 Feather Street Currimundi VIC 3330',
'Cilkaki330@workemail.com', '1989-11-13', '0445783823'),
('DRV02', 'Draven', 'Vinay', '97 Souttar Terrace Connolly VIC 3349',
'Dravenvivi123@gmail.com', '1994-10-18', '0432165344'),
('GET08', 'Gemma', 'Trott', '7 Ocean Street DARLING HARBOUR VIC 2000',
'Gemma773@email.com', '1999-08-14', '0489010308'),
('ISM07', 'Isla', 'Morwood', '7 Martin place Clayton VIC 3841 ',
'Isla9399@gmail.com', '1972-06-12', '0453760993'),
('KAB10', 'Katie', 'Begg', '83 Shirley Street CEDAR CREEK VIC 4207',
'Katiebegbeg388@gmail.com', '1996-05-09', '0431138762'),
('KAN14', 'Kayla', 'Nathan', '86 Davis Street FERNY GROVE VIC 4055',
'KaylaNathan@dayrep.com', '2002-03-20', '0436013446'),
```

```
('LIE11', 'Liam', 'Elijah', '8 newstreet Monash VIC 21232 ',
'Liam742@workeemail.com', '1989-08-23', '0412398747'),
('MAC06', 'Mariam', 'Clements', '59 Rockhampton ULOGIE VIC 3123',
'MariamClements@jourrapide.com', '1975-11-13', '0449292129'),
('OSW09', 'Oscar', 'Weatherburn', '3 Cherokee Road WALMER VIC 3463',
'OscarWeatherburn@rhyta.com', '2000-08-24', '0453891614'),
('SEH04', 'Sebastian', 'Hawkins', '18 Cecil Street CARLINGFORD NORTH
VIC 3118', 'KaylaBand@rhyta.com', '1975-07-16', '0488174980'),
('WIH13', 'William', 'Holdsworth', '66 Bathurst Road TURONDALE VIC
2795', 'WilliamHoldsworth@teleworm.us', '1998-11-19', '0440781352');
```

staff_id	staff_given_name	staff_last_name	staff_address	staff_email	staff_dob	staff_phone_number
AMB01	Amy	Bell	53 Mandible Street MOUNT EAST VIC 4825	Amy686@gmail.com	1994-11-17	0445083709
AMK12	Amelia	Kleeberg	31 Lapko Road BORDEN VIC 6338	Amelia443@gmail.com	1992-11-19	0490890229
ASB15	Ashton	Bromley	11 Girvan Grove EAGLEHAWK VIC 3556	AshtonGogo123@gmail.com	1996-05-18	0453170966
BES05	Benjamin	Streeten	93 Barker Street MARRACOONDA VIC 6317	BenjaminStreeten@rhyta.com	1964-09-18	0490764111
CEM03	Cilka	Emlyn	27 Feather Street Currimundi VIC 3330	Cilkaki330@workemail.com	1989-11-13	0445783823
DRV02	Draven	Vinay	97 Souttar Terrace Connolly VIC 3349	Dravenvivi123@gmail.com	1994-10-18	0432165344
GET08	Gemma	Trott	7 Ocean Street DARLING HARBOUR VIC 2000	Gemma773@email.com	1999-08-14	0489010308
ISM07	Isla	Morwood	7 Martin place Clayton VIC 3841	Isla9399@gmail.com	1972-06-12	0453760993
KAB10	Katie	Begg	83 Shirley Street CEDAR CREEK VIC 4207	Katiebegbeg388@gmail.com	1996-05-09	0431138762
KAN14	Kayla	Nathan	86 Davis Street FERNY GROVE VIC 4055	KaylaNathan@dayrep.com	2002-03-20	0436013446
LIE11	Liam	Elijah	8 newstreet Monash VIC 21232	Liam742@workeemail.com	1989-08-23	0412398747
MAC06	Mariam	Clements	59 Rockhampton ULOGIE VIC 3123	MariamClements@jourrapide.com	1975-11-13	0449292129
OSW09	Oscar	Weatherburn	3 Cherokee Road WALMER VIC 3463	OscarWeatherburn@rhyta.com	2000-08-24	0453891614
SEH04	Sebastian	Hawkins	18 Cecil Street CARLINGFORD NORTH VIC 3118	KaylaBand@rhyta.com	1975-07-16	0488174980
WIH13	William	Holdsworth	66 Bathurst Road TURONDALE VIC 2795	WilliamHoldsworth@teleworm.us	1998-11-19	0440781352

Salary

```
INSERT INTO `salary` (`staff_id`, `salary_multiplier`, `yearly_bonus`)
VALUES
('AMB01', '2.00', '150.00'),
('AMK12', '2.00', '220.00'),
('ASB15', '1.00', '112.00'),
('BES05', '2.00', '180.00'),
('CEM03', '2.00', '200.00'),
('DRV02', '1.00', '110.00'),
('GET08', '2.00', '166.00'),
('ISM07', '2.00', '230.00'),
('KAB10', '1.00', '100.00'),
('KAN14', '2.00', '250.00'),
('LIE11', '2.00', '290.00'),
('MAC06', '1.00', '160.00'),
('OSW09', '2.00', '275.00'),
('SEH04', '2.00', '300.00'),
('WIH13', '1.00', '115.00');
```

staff_id	salary_multiplier	yearly_bonus
AMB01	2.00	150.00
AMK12	2.00	220.00
ASB15	1.00	112.00
BES05	2.00	180.00
CEM03	2.00	200.00
DRV02	1.00	110.00
GET08	2.00	166.00
ISM07	2.00	230.00
KAB10	1.00	100.00
KAN14	2.00	250.00
LIE11	2.00	290.00
MAC06	1.00	160.00
OSW09	2.00	275.00
SEH04	2.00	300.00
WIH13	1.00	115.00

Shift_allocation

```
INSERT INTO `shift_allocation` (`staff_position_id`, `start_time_date`,
`duration`) VALUES
(1, '2022-11-06 08:30:00', 7),
(2, '2022-11-06 08:00:00', 7),
(3, '2022-11-06 09:00:00', 6),
(4, '2022-11-06 08:30:00', 7),
(5, '2022-11-06 08:00:00', 7),
(6, '2022-11-06 09:00:00', 6),
(7, '2022-11-06 08:30:00', 7),
(8, '2022-11-06 08:00:00', 7),
(9, '2022-11-06 09:00:00', 6),
(10, '2022-11-06 08:30:00', 7),
(11, '2022-11-06 08:00:00', 7),
(12, '2022-11-06 09:00:00', 6),
(13, '2022-11-06 08:30:00', 7),
(14, '2022-11-06 08:00:00', 7),
(15, '2022-11-06 09:00:00', 6);
```

staff_position_id	start_time_date	duration
1	2022-11-06 08:30:00	7
2	2022-11-06 08:00:00	7
3	2022-11-06 09:00:00	6
4	2022-11-06 08:30:00	7
5	2022-11-06 08:00:00	7
6	2022-11-06 09:00:00	6
7	2022-11-06 08:30:00	7
8	2022-11-06 08:00:00	7
9	2022-11-06 09:00:00	6
10	2022-11-06 08:30:00	7
11	2022-11-06 08:00:00	7
12	2022-11-06 09:00:00	6
13	2022-11-06 08:30:00	7
14	2022-11-06 08:00:00	7
15	2022-11-06 09:00:00	6

Staff_position

```
INSERT INTO `staff_position` (`staff_position_id`, `staff_id`,
`position_id`, `department_id`, `manager_id`, `start_date`, `end_date`)
VALUES
(1, 'AMB01', 'AA004', 'ACC04', 'AMK12', '2020-01-21', '2025-11-20'),
(2, 'AMK12', 'AM004', 'ACC04', 'AMK12', '2018-11-05', '2027-09-22'),
(3, 'ASB15', 'AT004', 'ACC04', 'AMK12', '2020-10-22', '2023-07-19'),
(4, 'BES05', 'DA003', 'DES03', 'CEM03', '2020-11-16', '2025-09-27'),
(5, 'CEM03', 'DM003', 'DES03', 'CEM03', '2018-07-23', '2027-10-22'),
(6, 'DRV02', 'DT003', 'DES03', 'CEM03', '2020-11-18', '2027-10-15'),
(7, 'GET08', 'MA001', 'MAR01', 'ISM07', '2021-11-17', '2025-10-25'),
(8, 'ISM07', 'MM001', 'MAR01', 'ISM07', '2018-09-15', '2023-11-23'),
(9, 'KAB10', 'MT001', 'MAR01', 'ISM07', '2021-09-09', '2023-11-02'),
(10, 'KAN14', 'RA005', 'RES05', 'LIE11', '2018-07-23', '2026-11-20'),
(11, 'LIE11', 'RM005', 'RES05', 'LIE11', '2018-09-08', '2026-09-18'),
(12, 'MAC06', 'RT005', 'RES05', 'LIE11', '2019-11-14', '2025-11-14'),
(13, 'OSW09', 'TA002', 'TES02', 'SEH04', '2019-11-15', '2024-11-15'),
(14, 'SEH04', 'TM002', 'TES02', 'SEH04', '2019-11-16', '2027-11-16'),
(15, 'WIH13', 'TT002', 'TES02', 'SEH04', '2020-11-19', '2025-11-19'),
(16, 'ASB15', 'DT003', 'DES03', 'CEM03', '2012-09-15', '2020-10-22'),
(17, 'DRV02', 'AT004', 'ACC04', 'AMK12', '2013-09-15', '2021-11-17'),
(18, 'DRV02', 'MT001', 'MAR01', 'ISM07', '2012-05-17', '2013-05-17'),
(19, 'KAB10', 'RT005', 'RES05', 'SEH04', '2013-03-08', '2021-09-09'),
(20, 'MAC06', 'MT001', 'MAR01', 'ISM07', '2013-06-20', '2019-11-14'),
(21, 'MAC06', 'TT002', 'TES02', 'SEH04', '2012-07-23', '2013-06-20'),
(22, 'ISM07', 'DM003', 'DES03', 'CEM03', '2015-09-11', '2018-09-15'),
(23, 'CEM03', 'MM001', 'MAR01', 'ISM07', '2015-07-23', '2018-07-23'),
(24, 'SEH04', 'RM005', 'RES05', 'LIE11', '2018-09-08', '2019-11-16'),
(25, 'LIE11', 'TM002', 'TES02', 'SEH04', '2017-09-16', '2018-09-08');
```

staff_position_id	staff_id	position_id	department_id	manager_id	start_date	end_date
1	AMB01	AA004	ACC04	AMK12	2020-01-21	2025-11-20
2	AMK12	AM004	ACC04	AMK12	2018-11-05	2027-09-22
3	ASB15	AT004	ACC04	AMK12	2020-10-22	2023-07-19
4	BES05	DA003	DES03	CEM03	2020-11-16	2025-09-27
5	CEM03	DM003	DES03	CEM03	2018-07-23	2027-10-22
6	DRV02	DT003	DES03	CEM03	2020-11-18	2027-10-15
7	GET08	MA001	MAR01	ISM07	2021-11-17	2025-10-25
8	ISM07	MM001	MAR01	ISM07	2018-09-15	2023-11-23
9	KAB10	MT001	MAR01	ISM07	2021-09-09	2023-11-02
10	KAN14	RA005	RES05	LIE11	2018-07-23	2026-11-20
11	LIE11	RM005	RES05	LIE11	2018-09-08	2026-09-18
12	MAC06	RT005	RES05	LIE11	2019-11-14	2025-11-14
13	OSW09	TA002	TES02	SEH04	2019-11-15	2024-11-15
14	SEH04	TM002	TES02	SEH04	2019-11-16	2027-11-16
15	WIH13	TT002	TES02	SEH04	2020-11-19	2025-11-19
16	ASB15	DT003	DES03	CEM03	2012-09-15	2020-10-22
17	DRV02	AT004	ACC04	AMK12	2013-09-15	2021-11-17
18	DRV02	MT001	MAR01	ISM07	2012-05-17	2013-05-17
19	KAB10	RT005	RES05	SEH04	2013-03-08	2021-09-09
20	MAC06	MT001	MAR01	ISM07	2013-06-20	2019-11-14
21	MAC06	TT002	TES02	SEH04	2012-07-23	2013-06-20
22	ISM07	DM003	DES03	CEM03	2015-09-11	2018-09-15
23	CEM03	MM001	MAR01	ISM07	2015-07-23	2018-07-23
24	SEH04	RM005	RES05	LIE11	2018-09-08	2019-11-16
25	LIE11	TM002	TES02	SEH04	2017-09-16	2018-09-08

6. Queries using JOIN and GROUP operations

Join, group

Query		Purpose
SELECT department_name, COUNT(staff_id) AS Number_of_staff FROM department NATURAL JOIN staff_position GROUP BY department_id;		The number of staff members in each department.

department_name	Number_of_staff
Account department	4
Product design department	5
Marketing department	6
Research department	5
Product testing department	5

```
SELECT staff.staff_last_name,
staff.staff_id,(position.hourly_salary
*shift_allocation. duration) as
cal_pay
From staff
Inner join staff_position on
staff.staff_id =
staff_position.staff_id

Inner join position on
staff_position.position_id =
position.position_id

Inner join shift_allocation on
staff_position.staff_position_id
=shift_allocation. staff_position_id

where shift_allocation.start_time_date
< '2022-11-06 23:59:59' and
shift_allocation.start_time_date >=
'2022-11-06 08:00:00';
```

staff_last_name	staff_id	cal_pay
Bell	AMB01	269.15
Kleeberg	AMK12	423.36
Bromley	ASB15	183.30
Streeten	BES05	254.66
Emlyn	CEM03	397.18
Vinay	DRV02	180.00
Trott	GET08	262.15
Morwood	ISM07	380.66
Begg	KAB10	181.26
Nathan	KAN14	269.15
Elijah	LIE11	409.36
Clements	MAC06	189.30
Weatherburn	OSW09	276.15
Hawkins	SEH04	423.36
Holdsworth	WIH13	194.70

Calculate the salary of staff for the hours completed on 2022-11-06.

```
SELECT c.cust_order_item_quantity,
p.prod_name, p.prod_unit,
p.prod_selling_unit_price FROM
cust_order_item c JOIN product p on
c.prod_id = p.prod_id WHERE
c.cust_order_id = 6;
```

cust_order_item_quantity	prod_name	prod_unit	prod_selling_
1	2% BHA Liquid Exfoliant	Bottle	
2	Skin Control Pimple Pack	Sheet	
3	The Ordinary Niacinamide	Bottle	
1	B5 Hyaluronic Acid Serum 30ml	Bottle	

Order Summary for 1 customer order

In this example: cust_order_id = 6.

```
SELECT c.prod_id,
SUM(c.cust_order_item_quantity) as
unit_sold, p.prod_name, p.prod_unit,
p.prod_selling_unit_price as
unit_price FROM cust_order_item c JOIN
product p on c.prod_id = p.prod_id
JOIN cust_order co on c.cust_order_id
= co.cust_order_id WHERE
co.cust_order_datetime > '2022-11-01
00:00:00' GROUP by prod_id;
```

prod_id	unit_sold	prod_name	prod_unit	unit_price
AC0001	5	2% BHA Liquid Exfoliant	Bottle	10.00
CL0001	6	Oat Cleansing Balm 150ml	Tube	8.79
LI0001	5	Lanolips Strawberry Balm	Stick	14.99
LI0002	1	BONDI SANDS SPF 50+ Lip Balm Coconut 10 g	Stick	6.99
MO0001	2	Squalane and Probiotic Gel Moisturizer	Bottle	44.00
PA0001	9	COSRX Acne Patch	Sheet	3.80
PA0002	6	Skin Control Pimple Pack	Sheet	5.04
SE0001	12	The Ordinary Niacinamide	Bottle	10.60
SE0002	9	Skinceuticals Vitamin C	Bottle	233.15
SE0003	6	B5 Hyaluronic Acid Serum 30ml	Bottle	34.76

Total Quantity sold of each product over a period of time (In this example, November)

```
SELECT a.stock_order_id,
b.stock_order_date, b.supp_id,
SUM(stock_order_item_quantity*stock_or
der_item_unit_price) as
stock_order_total FROM
stock_order_item a JOIN stock_order b
on a.stock_order_id = b.stock_order_id
WHERE b.stock_order_date > '2022-11-01
00:00:00'GROUP by stock_order_id;
```

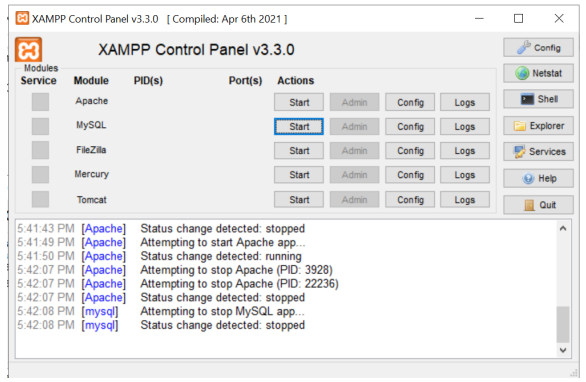
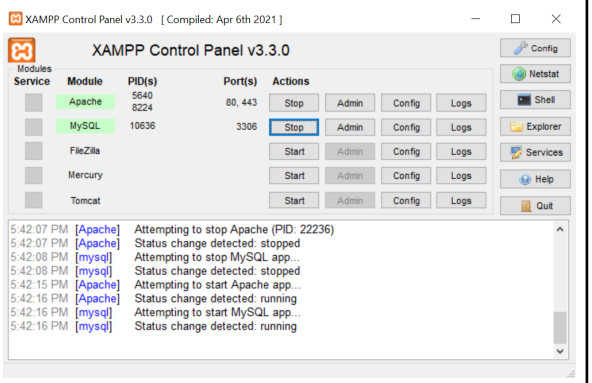
stock_order_id ▲ 1	stock_order_date	supp_id	stock_order_total
1	2022-11-02 15:56:55	1	501000.00
2	2022-11-02 15:57:41	1	20375.00
3	2022-11-04 14:56:57	4	48535.00
4	2022-11-04 14:56:57	5	22975.00
5	2022-11-04 14:56:57	6	20000.00
6	2022-11-04 14:56:57	7	22475.00
7	2022-11-04 14:56:57	8	47835.00

Calculate the total of all stock order from the beginning of November

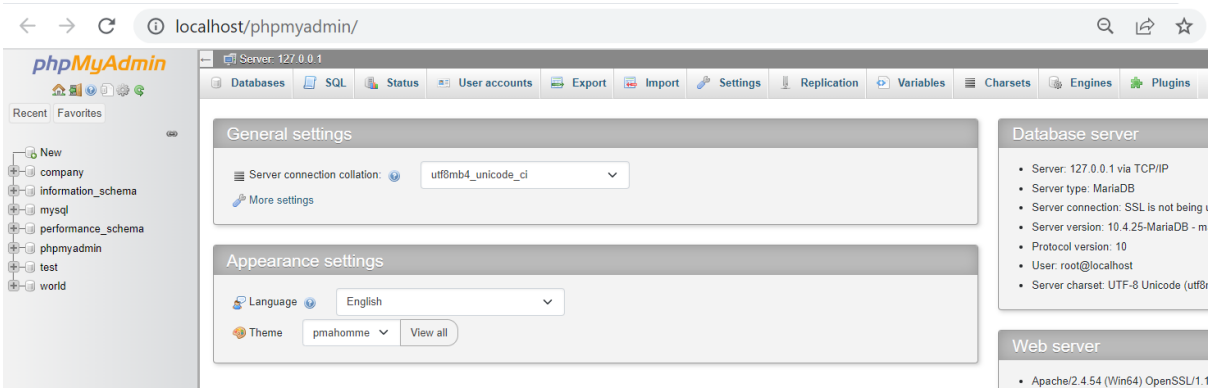
7. Requirements and Implementation Details

1. Install and Set up XAMPP Control Panel
2. Open the XAMPP control panel

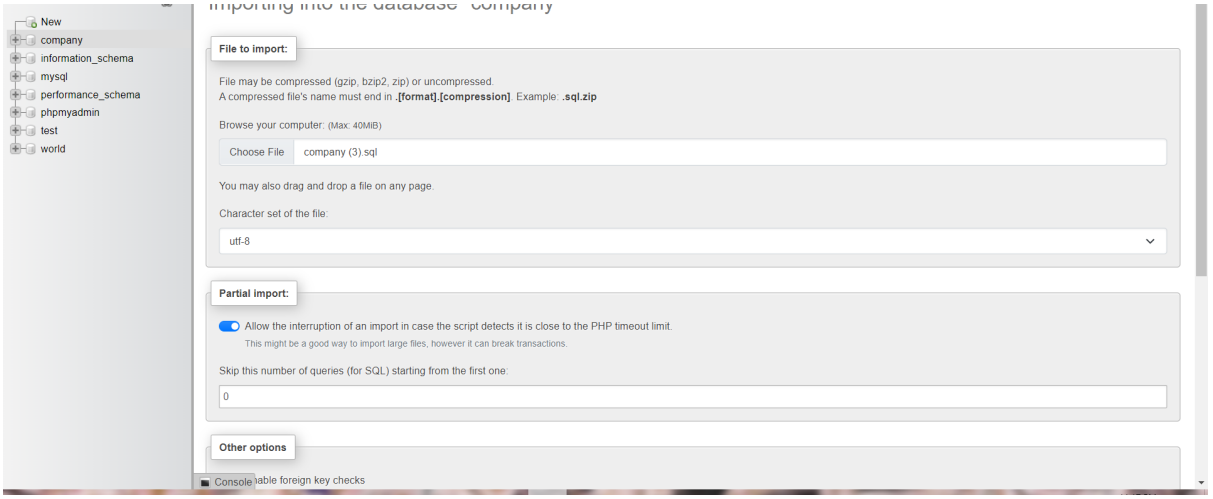
Start Apache and MySQL

Before	After
	

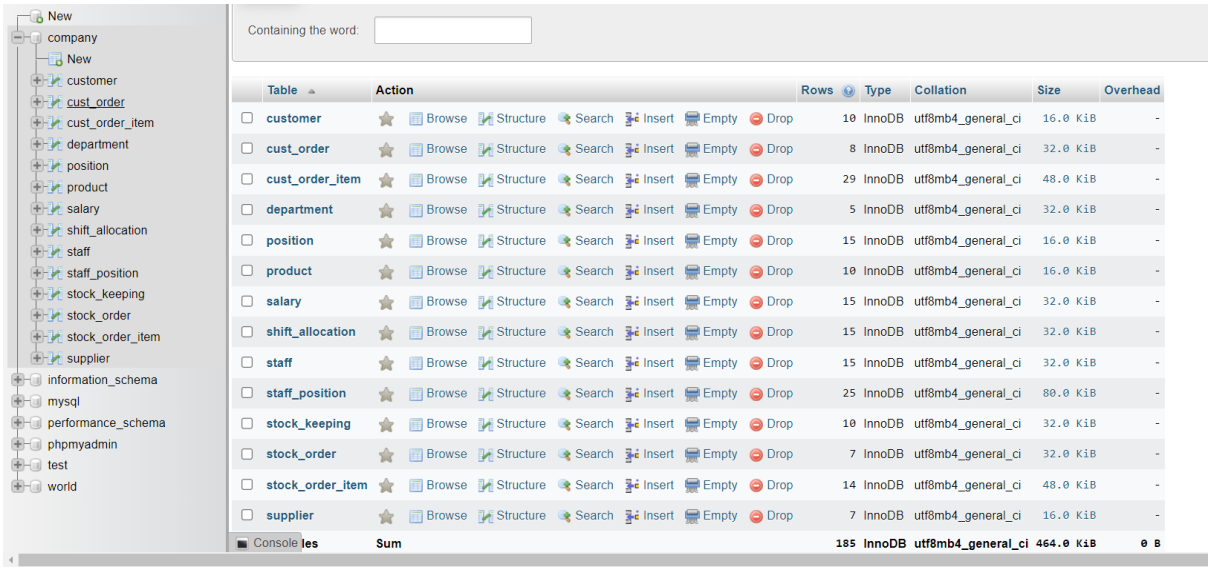
3. On the MySql, row click Admin



4. Import table: In the file, import choose SQL file demonstrated here company(3).sql, press the import button end of the page.



5. Imported database completed.


New
company
New
customer
cust_order
cust_order_item
department
position
product
salary
shift_allocation
staff
staff_position
stock_keeping
stock_order
stock_order_item
supplier
information_schema
mysql
performance_schema
phpmyadmin
test
world
Containing the word:
Table
Action
Rows
Type
Collation
Size
Overhead
customer Browse Structure Search Insert Empty Drop 10 InnoDB utf8mb4_general_ci 16.0 KiB -
cust_order Browse Structure Search Insert Empty Drop 8 InnoDB utf8mb4_general_ci 32.0 KiB -
cust_order_item Browse Structure Search Insert Empty Drop 29 InnoDB utf8mb4_general_ci 48.0 KiB -
department Browse Structure Search Insert Empty Drop 5 InnoDB utf8mb4_general_ci 32.0 KiB -
position Browse Structure Search Insert Empty Drop 15 InnoDB utf8mb4_general_ci 16.0 KiB -
product Browse Structure Search Insert Empty Drop 10 InnoDB utf8mb4_general_ci 16.0 KiB -
salary Browse Structure Search Insert Empty Drop 15 InnoDB utf8mb4_general_ci 32.0 KiB -
shift_allocation Browse Structure Search Insert Empty Drop 15 InnoDB utf8mb4_general_ci 32.0 KiB -
staff Browse Structure Search Insert Empty Drop 15 InnoDB utf8mb4_general_ci 32.0 KiB -
staff_position Browse Structure Search Insert Empty Drop 25 InnoDB utf8mb4_general_ci 80.0 KiB -
stock_keeping Browse Structure Search Insert Empty Drop 10 InnoDB utf8mb4_general_ci 32.0 KiB -
stock_order Browse Structure Search Insert Empty Drop 7 InnoDB utf8mb4_general_ci 32.0 KiB -
stock_order_item Browse Structure Search Insert Empty Drop 14 InnoDB utf8mb4_general_ci 48.0 KiB -
supplier Browse Structure Search Insert Empty Drop 7 InnoDB utf8mb4_general_ci 16.0 KiB -
Console
les Sum 185 InnoDB utf8mb4_general_ci 464.0 KiB 0 B