

1.1. Justification of Cardinality Ratios

- ❖ From customer to charter it is one to many relation
- ❖ From charter to port it is many to many relation
- ❖ From charter to yacht many to one relation
- ❖ From port to yacht one to many relation.

1.2. Justification of Participation Constraints

- A Customer can book many Charters, but each Charter is booked by one Customer.
- A Yacht may be involved in many Charters, but each Charter involves one Yacht.
- A Charter may visit several Ports, and each Port can be visited by many Charters.
- Most Ports have several Yachts based in them, but each Yacht is based in just one Home Port.

1.3. Entities and Attributes

CUSTOMER (**cx_id**, cx_name, cx_email, nationality, cx_phone_no)
PORT (**p_name**, p_phone_no, p_email, docking_no)
YACHT (**y_name**, y_type, y_model, cost_of_hire, berth_no, home_port)
CHARTER (**charter_id**, start_date, charter_duration)
VISIT (**visit_id**, start_date, date_of_arrival, visit_duration)

1. Relational Schema and Consideration of Normalisation

2.1. Relational Schema

CUSTOMER (**cx_id**, cx_name, cx_email, nationality, cx_phone_no)
PORT (**p_name**, p_phone_no, p_email, docking_no)
YACHT (**y_name**, y_type, y_model, cost_of_hire, berth_no, home_port)
CHARTER (**charter_id**, cx_id*, y_name*, start_date, charter_duration)
VISIT (**visit_id**, start_date, date_of_arrival, visit_duration, p_name*, charter_id*)

2.2. Choice of Datatypes

- ❖ **Varchar** is used for words and phone numbers
- ❖ **TinyInt** is used for visit_duration, charter_duration, berth_no
- ❖ **Smallint** is used for docking_no
- ❖ **Decimal** is used for cost_of_hire.
- ❖ **Date** is used for dates.

2.3. Normalisation

CUSTOMER (**cx_id**, cx_name, cx_email, nationality, cx_phone_no)
PORT (**p_name**, p_phone_no, p_email, docking_no)
YACHT (**y_name**, y_type, y_model, cost_of_hire, berth_no, home_port)
CHARTER (**charter_id**, cx_id*, y_name*, start_date, charter_duration)
VISIT (**visit_id**, start_date, date_of_arrival, visit_duration, p_name*, charter_id*)

This all entities are in 3rd normal form.

Bold letter and underlined word in schemas indicate primary key and * indicate foreign referencing key.