# COIT20247 - Database Design & Development
# Tutorial Solutions – Conceptual modelling (Basic)

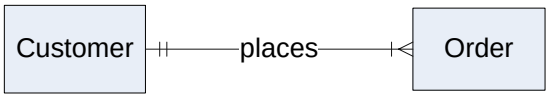
1. **Entity type**: A person, place, object or event about which the organization wishes to maintain data.
   **Entity instance:** A single occurrence of an entity type.
   An entity instance is a specific example of an entity type, whereas the entity type describes the instances *in general*.

2. Left as an exercise.

3. **Attribute:** A property or characteristic of an entity that is of interest to the organization.
   **Value:** The value of an attribute for a specific entity instance.
   Entity types have attributes, entity instances have values.

4. Left as an exercise.

5. **Maximum cardinality:** With respect to the diagram below, the maximum cardinality of customer to order is *many*, meaning that a customer may place many orders. The maximum cardinality of order to customer is *one*, meaning that each order can be placed by at most one customer.
   **Minimum cardinality:** With respect to the diagram below, the minimum cardinality of customer to order is *one*, meaning that a customer must place at least one order. The minimum cardinality of order to customer is *one*, meaning that each order must be placed by at least one customer.




6. The relationship is a 1:M because the maximum cardinality is 1 and M.

7. Left as an exercise.

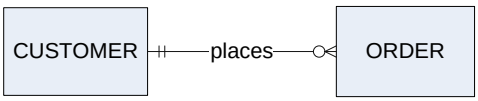
8. An associative entity is represented by a rectangle with rounded corners. The unique identifier for an associative entity is a combination of the unique identifiers from the related entities.

9. Left as an exercise.

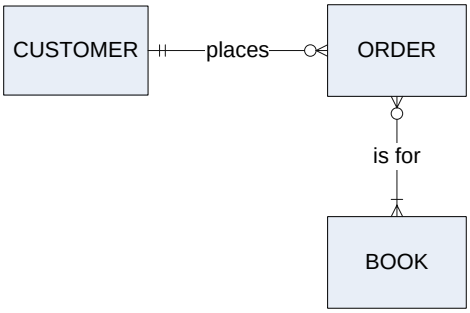
10. Left as an exercise.

**Case Study 0 – Best books**

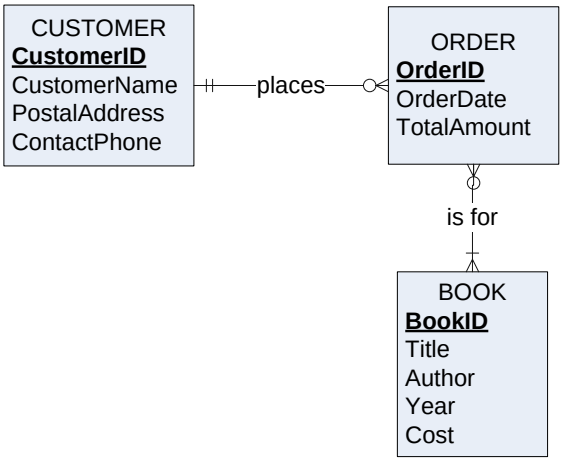
1) In the case study, *customer*s place *order*s. Draw this as two entities and a relationship.
   a) This is a 1:M relationship.
   b) A *single order* is placed by **one** and only **one** customer
   c) A single customer can place **zero** orders, and over time may place **many** orders



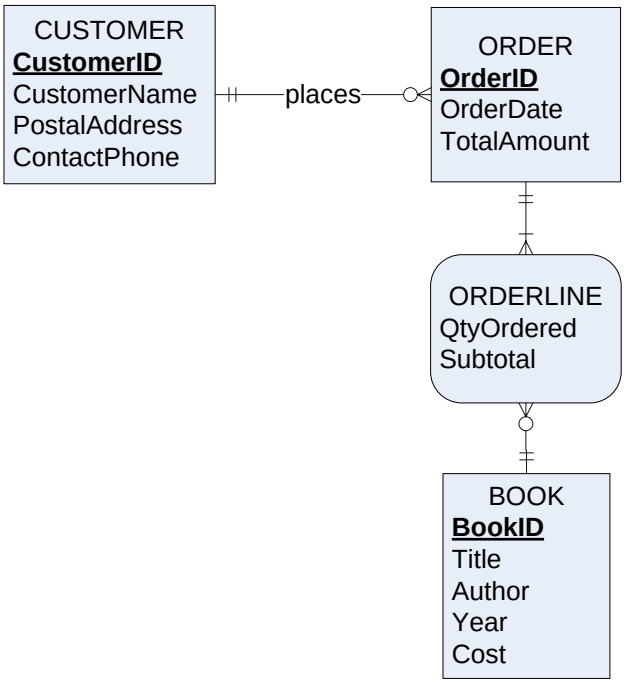
2) An order is for books. Add this to your ER model so far.
   a) This is a M:M relationship.
   b) A single order must contain **at least one** book and may contain **many** books
   c) A single book might appear on **zero** orders or **many** orders




3) Add appropriate attributes for each entity.




4) For *each book* on *each order*, it is necessary to record the quantity ordered and the subtotal.
   i) **If you place this attribute in the Book entity, then you can only ever record one quantity attribute for each book. However, you need to be able to record quantity ordered *each time that a book is ordered* (which may be thousands of times) and not just once for each book. Likewise for subtotal.**
   ii) **If you place this attribute in the Order entity, then you can only ever record the quantity ordered attribute once for each order. However, you need to be able to record quantity ordered for *each book that appears on the order* (which may be many) and not just once for each order. Likewise for subtotal.**
   iii) An associative entity is required.
   iv) As below.




**Case Study 1 – Real estate**