

## Triggers

The following relations are given (primary keys are underlined, optional attributes are denoted with \*):

RENTAL-REQUEST(ReqCode, ReqDate, MemberCode, RentalStartDate, RentalEndDate, Model)

RENTAL-CANCELLATION(CanCode, CancDate, MemberCode, RentalStartDate, BCode)

RENTAL(BCode, StartDate, EndDate, MemberCode)

WAITING-RENTAL(ReqCode, ReqDate, MemberCode, RentalStartDate, RentalEndDate, Model)

BOAT(BCode, BName, Model, Maker, MYear)

Write the triggers managing two events: (i) A new request of boat rental and (ii) a cancellation of a given boat rental.

When a new rental is requested, it is necessary to verify if a boat of the requested model is available in the requested period of time. If so, a new record is inserted in the RENTAL table. If more than one boat are available, the newest boat (i.e., maximum MYear) is rented (let assume that, there always exists a single boat made in a given date). If no boats are available in the requested period of time, the request is inserted in the WAITING-RENTAL table.

When a rental is canceled (i.e., insertion in the RENTAL-CANCELLATION table), rental information needs to be deleted from the RENTAL table. Furthermore, it is necessary to verify if there are waiting rentals for the boat model that became available in the requested period of time. If so, the oldest waiting request is selected (let assume that, there always exists a single waiting request for a given period of time and boat model). A new rental is defined for that waiting request and it is deleted from the table WAITING-RENTAL.

## *Draft solution*

### *New request of boat rental*

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CREATE OR REPLACE TRIGGER RENTAL_VERIFICATION
AFTER INSERT ON RENTAL_REQUEST
FOR EACH ROW
DECLARE
    X NUMBER;
    CODE NUMBER;

BEGIN
    --- count how many boats are available in the requested period
    SELECT COUNT(*) INTO X
    FROM BOAT
    WHERE Model = :NEW.Model
    AND BCode NOT IN ( SELECT BCode
                        FROM RENTAL
                        WHERE StartDate ≤ :NEW.RentalEndDate
                        AND EndDate ≥ :NEW. RentalStartDate);

    --- if there is at least one boat available
    IF ( X ≥ 1) THEN
        --- select the newest boat available in the requested period
        SELECT BCode INTO CODE
        FROM BOAT
        WHERE Model = :New.Model
        AND BCode NOT IN ( SELECT BCode
                            FROM RENTAL
                            WHERE StartDate ≤ :NEW.RentalEndDate
                            AND EndDate ≥ :NEW. RentalStartDate)
        AND MYear = (SELECT MAX(MYear)
                     FROM BOAT
                     WHERE Model = :NEW.Model
                     AND BCode NOT IN ( SELECT BCode
                                         FROM RENTAL
                                         WHERE StartDate ≤ :NEW.RentalEndDate
                                         AND EndDate ≥ :NEW.RentalStartDate));

        --- insert the new rental
        INSERT INTO RENTAL (BCode, StartDate, EndDate, MemberCode)
        VALUES (CODE, :NEW.RentalStartDate, :NEW.RentalEndDate, :NEW.MemberCode);
    ELSE
        --- no boat available
        INSERT INTO WAITING-RENTAL(ReqCode, ReqDate, MemberCode, RentalStartDate, RentalEndDate,
        Model)
        VALUES (:NEW.ReqCode, :NEW.ReqDate, :NEW.MemberCode, :NEW.RentalStartDate,
        :NEW.RentalEndDate, :NEW.Model);
    END IF;
END;

```

Cancel of a boat rental

```

CREATE OR REPLACE TRIGGER RENTAL_DELETE
AFTER INSERT ON RENTAL_CANCELLATION
FOR EACH ROW
DECLARE
    Y NUMBER;
    ED DATE;
    M VARCHAR (10);
    A NUMBER;
    B DATE;
    C DATE;
    D NUMBER;
BEGIN
    SELECT EndDate INTO ED
    FROM RENTAL
    WHERE BCode = :NEW.BCode AND StartDate = :NEW.RentalStartDate;

    DELETE FROM RENTAL
    WHERE BCode = :NEW.BCode AND StartDate = :NEW.RentalStartDate;

    SELECT Model INTO M
    FROM BOAT
    WHERE BCode = :NEW.BCode;

    SELECT COUNT(*) INTO Y
    FROM WAITING_RENTAL
    WHERE Model = M AND RentalStartDate ≥ :NEW.RentalStartDate AND RentalEndDate ≤ ED;

    --- if there is at least one pending request for a boat of that model
    IF ( Y ≥ 1) THEN
        --- select the oldest boat request
        SELECT ReqCode, RentalStartDate, RentalEndDate, MemberCode INTO A, B, C, D
        FROM WAITING_RENTAL
        WHERE Model = M
        AND RentalStartDate ≥ :NEW.RentalStartDate AND RentalEndDate ≤ ED
        AND ReqDate = (SELECT MIN(ReqDate)
                       FROM WAITING_RENTAL
                       WHERE Model = M
                       AND RentalStartDate ≥ :NEW.RentalStartDate AND RentalEndDate ≤ ED);

        --- insert the new rental
        INSERT INTO RENTAL (BCode, StartDate, EndDate, MemberCode)
        VALUES (:NEW.BCode, B, C, D);

        --- delete from waiting_rental
        DELETE FROM WAITING_RENTAL
        WHERE ReqCode = A;
    END IF;
END;

```