Exercise 4.5 Solutions

Question 1

```
SELECT  C.eid
FROM    Aircraft A, Certified C
WHERE   A.aid = C.aid AND  A.aname = 'Boeing'
```

Question 2

```
SELECT  E.ename
FROM    Aircraft A, Certified C, Employees E
WHERE   A.aid = C.aid AND  A.aname = 'Boeing' AND  E.eid = C.eid
```

Question 3

```
SELECT  A.aid
FROM    Aircraft A, Flights F
WHERE   F.from = 'Bonn' AND  F.to = 'Madrid' AND
        A.cruisingrange > F.distance
```

Question 4

```
SELECT  E.ename
FROM    Aircraft A, Certified C, Employees E, Flights F
WHERE   A.aid = C.aid AND  E.eid = C.eid AND
        distance < cruisingrange AND  salary > 100,000
```

Question 5

```
SELECT  E.ename
FROM    Certified C, Employees E, Aircraft A
WHERE   A.aid = C.aid AND E.eid = C.eid AND A.cruisingrange > 3000
AND E.eid NOT IN ( SELECT C2.eid
FROM Certified C2, Aircraft A2
WHERE C2.aid = A2.aid AND A2.aname = 'Boeing' )
```

Question 6

```
SELECT  E.eid
FROM    Employees E
WHERE   E.salary = ( Select MAX (E2.salary)
                         FROM  Employees E2 )
```

Question 7

```
SELECT  E.eid
FROM    Employees E
WHERE   E.salary = (SELECT MAX (E2.salary)
                    FROM    Employees E2
                    WHERE   E2.salary ≠ (SELECT MAX (E3.salary)
                                         FROM    Employees E3 ))
```

Question 8

```
SELECT  Temp.eid
FROM    ( SELECT      C.eid AS eid, COUNT (C.aid) AS cnt,
          FROM        Certified C
          GROUP BY  C.eid) AS Temp
WHERE   Temp.cnt = ( SELECT      MAX (Temp.cnt)
                     FROM        Temp)
```

Question 9

```
SELECT  C1.eid
FROM    Certified C1, Certified C2, Certified C3
WHERE   (C1.eid = C2.eid AND  C2.eid = C3.eid AND
        C1.aid ≠ C2.aid AND  C2.aid ≠ C3.aid AND  C3.aid ≠ C1.aid)
EXCEPT
SELECT  C4.eid
FROM    Certified C4, Certified C5, Certified C6, Certified C7,
WHERE   (C4.eid = C5.eid AND  C5.eid = C6.eid AND  C6.eid = C7.eid AND
        C4.aid ≠ C5.aid AND  C4.aid ≠ C6.aid AND  C4.aid ≠ C7.aid AND
        C5.aid ≠ C6.aid AND  C5.aid ≠ C7.aid AND  C6.aid ≠ C7.aid )
```

This could also be done in SQL using COUNT.

Question 10

```
SELECT  SUM (E.salaries)
FROM    Employees E
```