Exercise 6.3.2

(b)
SELECT DISTINCT class
FROM Ships
WHERE name IN (SELECT ship
FROM Outcomes
WHERE result = 'sunk');

SELECT DISTINCT Classes.class
FROM Classes JOIN Ships ON Classes.class = Ships.class
WHERE EXISTS (SELECT Ship
FROM Outcomes
WHERE result = 'sunk' AND ship = name);

(b) Output:

```
 class
-------
 Kongo
(1 row)
```

(e) Output:

```
      name
----------------
 Wisconsin
 New Jersey
 Missouri
 Iowa
 Washington
 North Carolina
 Royal Sovereign
 Royal Oak
 Revenge
 Resolution
 Ramillies
 Tennessee
 California
 Yamato
 Musashi
(15 rows)
```

(e)
SELECT name
FROM Ships JOIN Classes C1 ON Ships.class = C1.class
WHERE numGuns >= ALL (SELECT numGuns
FROM Ships JOIN Classes C2 ON Ships.class = C2.class
AND C2.bore = C1.bore);

SELECT name
FROM Ships JOIN Classes C1 ON Ships.class = C1.class
WHERE numGuns IN (SELECT MAX(numGuns)
FROM Ships JOIN Classes C2 ON Ships.class = C2.class
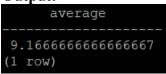AND C2.bore = C1.bore);

Exercise 6.4.7

(a) SELECT COUNT(class) FROM Classes WHERE type = 'bb';
Output:

```
 count
------
     6
(1 row)
```

(b) SELECT AVG(numGuns) AS average FROM Classes WHERE type = 'bb';
Output:

```
      average
-------------------
 9.1666666666666667
(1 row)
```

(c)
SELECT AVG(numGuns) AS average
FROM Classes JOIN Ships
ON Classes.class = Ships.class
WHERE type = 'bb';

Output:

```
      average
-------------------
 9.0666666666666667
(1 row)
```

(d) SELECT class, MIN(launched) AS year FROM Ships GROUP BY class;
Output:

```
     class      | year
----------------+------
 Renown         | 1916
 North Carolina | 1941
 Yamato         | 1941
 Kongo          | 1913
 Tennessee      | 1920
 Iowa           | 1943
 Revenge        | 1916
(7 rows)
```

(e)
SELECT class, COUNT(result) AS Sunk
FROM Ships JOIN Outcomes
ON Ships.name = Outcomes.ship
WHERE result = 'sunk'
GROUP BY class;

Output:

```
 class | sunk
-------+------
 Kongo |    1
(1 row)
```

(f)
SELECT Ships.class, COUNT(ship) AS sunk
FROM Outcomes JOIN Ships
ON Outcomes.ship = Ships.name
WHERE result = 'sunk' AND class IN (SELECT class
FROM Ships
WHERE (SELECT count(name)
FROM Ships S
WHERE S.class = Ships.class) >= 3)
GROUP BY class;

Output:

class	sunk
Kongo	1

(1 row)

(g)
SELECT country, AVG((bore^3)/2) AS avgshellweight
FROM Classes JOIN Ships ON Classes.class = Ships.class
GROUP BY country;

Output:

country	avgshellweight
Japan	1886.66666666667
USA	1879
Gt. Britain	1687.5

(3 rows)