

Solution

Solution 4a

The query in SQL:

```
SELECT star, SUM(mass) AS totalMass FROM Planets WHERE atmosphere GROUP BY
star HAVING COUNT(*) > 5;
```

The query in relational algebra:

$$\pi_{star, totalMass}(\sigma_{atmosphere \& planetcount > 5}(\gamma_{star, COUNT(*) \rightarrow planetcount, SUM(mass) \rightarrow totalMass}(Planets)))$$

Solution 4b

```
SELECT position, MAX(gravity) AS maxg
FROM (P NATURAL JOIN G)
GROUP BY position
ORDER BY maxg;
```