Part 1:

1. π<sub>shipName, companyName, (crew + passengers) AS TotalPeople</sub> (σ<sub>(crew + passengers) > 3500</sub> (S ⨝<sub>S.companyName = CO.companyName</sub> σ<sub>stockSymbol LIKE '%R%'</sub> (CO)))
2. π<sub>firstName, lastName, TO\_CHAR(sum(price), '$99,999.99') AS TotalSales</sub> (σ<sub>TotalSales > 1000</sub> (γ<sub>firstName, lastName; SUM(price) AS TotalSales</sub> (R ⨝<sub>R.cruiseID = CR.cruiseID</sub> (T ⨝<sub>T.travelAgentID = R.travelAgentID</sub> CR))))
3. π<sub>firstName, lastName, COUNT() AS Visits</sub> (γ<sub>customerID, firstName, lastName; COUNT() AS Visits</sub> (σ<sub>departurePort = 'Miami'</sub> (R ⨝<sub>R.cruiseID = CR.cruiseID</sub> (C ⨝<sub>C.customerID = R.customerID</sub>))))
4. OldCruises = π<sub>customerID, cruiseID</sub> (σ<sub>days < 7</sub> (R ⨝<sub>R.cruiseID = CR.cruiseID</sub> (CR ⨝<sub>CR.shipName = S.shipName</sub> S)))

NewCruises = π<sub>customerID, cruiseID</sub> (σ<sub>days > 7</sub> (R ⨝<sub>R.cruiseID = CR.cruiseID</sub> (CR ⨝<sub>CR.shipName = NS.newShipName</sub> NS)))

BothCruises = π<sub>firstName, lastName, COUNT(\*) AS TotalCruises</sub> (C ⨝<sub>C.customerID = OldCruises.customerID</sub> (C ⨝<sub>C.customerID = NewCruises.customerID</sub>))

1. π<sub>A + B AS E, C, X AS G</sub> (σ<sub>X > B</sub> (M ⨝<sub>M.B = N.B</sub> N))

Join:

| **A** | **B** | **C** | **D** | **X** | **Y** |
| --- | --- | --- | --- | --- | --- |
| 14 | 4 | Henry | David | 3 | Matt |
| 8 | 2 | Mary | Helen | 2 | Tom |
| 8 | 2 | Mary | Helen | 8 | Lisa |
| 2 | 6 | Jane | Susan | 8 | Mary |
| 61 | 3 | Tom | Paul | 2 | Tom |
| 61 | 3 | Tom | Paul | 42 | Henry |
| 2 | 5 | Lisa | Mary | 5 | John |
| 24 | 9 | Mark | John | 13 | Tom |
| 24 | 9 | Mark | John | 42 | Henry |
| 5 | 2 | Dan | Matt | 2 | Tom |
| 5 | 2 | Dan | Matt | 8 | Lisa |

Selection:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 8 | 2 | Mary | Helen | 8 | Lisa |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 2 | 6 | Jane | Susan | 8 | Mary |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 61 | 3 | Tom | Paul | 42 | Henry |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 2 | 5 | Lisa | Mary | 5 | John |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 24 | 9 | Mark | John | 13 | Tom |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 24 | 9 | Mark | John | 42 | Henry |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 5 | 2 | Dan | Matt | 8 | Lisa |

Projection:

| **E** | **C** | **G** |
| --- | --- | --- |
| 10 | Mary | 8 |
| 8 | Jane | 8 |
| 64 | Tom | 42 |
| 7 | Lisa | 5 |
| 33 | Mark | 13 |
| 33 | Mark | 42 |
| 7 | Dan | 8 |