A. OLAP and Data Warehouse (25%)

Consider the following table called **GDP**:

Place	Population	GDPperCapita	NATO	FirstCredited	Density
USA	320M	53K	Y	1776	34
Switzerland	8M	84K	N	1848	198
France	66M	45K	Y	1791	116
Italy	60M	35K	Y	1861	202
Denmark	6M	62K	Y	1849	131
China	1357M	7K	N	1912	279
Luxembourg	0.5M	112K	Y	1815	194

and the following query called $\mathbf{Q_1}$

```
SELECT NATO, Sum(Population) AS SumPop
FROM GDP
WHERE Density >= 100 AND GDPperCapita < 100K
GROUP BY NATO
```

1) Show the result of query $\mathbf{Q_1}$ by filling in the table below (you may not need to use all the rows and columns).

2) On the result you obtained in point 1), perform now a **drill-down** operation on the **Place** dimension, keeping it at the *continent* level, and show the result by filling in the table below (you may not need to use all the rows and columns)

3) On the result you obtained in point 2), perform now a **drill-down** operation on the **FirstCredited** dimension, keeping it at the *century* level, and show the result by filling in the table below (you may not need to use all the rows and columns)

4) On the result you obtained in point 3), perform now a **rollup** operation on **NATO** and show the result by filling in the table below (you may not need to use all the rows and columns)

5) Let $\mathbf{Q_2}$ be the same query as $\mathbf{Q_1}$ but with the "WITH CUBE" clause at the end. Show the result of query $\mathbf{Q_2}$ by filling in the table below (you may not need to use all the rows and columns)
