**Solution 3**

Calculation of Grain size:

* Franchises

350 franchises for merchandise sales

* Items

Merchandise: 500

MemberType: 10

ServCat: 20

Total: 530

* Customers

Members: 50000 members in the retail database

Corporate customers: 150\*200=30000

Total customers: 80000

* Fact table size

Merchandise purchases: 450000

Service purchases: 100000

Special events: 300\*200=60000

Total: 610000

* Sparsity estimate:

1 - ( fact table size / product of dimensions )

1 – (610000/(350\*530\*365\*80000) ) = 0.999999887

The data cube has mostly missing cells with slightly more than 1% of cells with non zero values