

### Solution 3

- 550 franchise: sum of franchise rows and unique franchise in spreadsheet
- 80,000 customers: sum of member rows and unique customers in spreadsheet (150 \* 200)
- Weeks per year: 52
- 510,000 sales: sum of sales (from contains 450,000) and event sales (from spreadsheet 300 \* 200)
- 100,000 services: the number of rows in ServPurchase
- There will be two fact tables:
  - The size Fact Table 1 (combination of individual franchise, customer, sales and weeks) will be the number of sales, i.e., 510,000
  - The size Fact Table 2 (combination of individual franchise, customer, services and weeks) will be the number of services, i.e., 100,000
- Sparsity estimate:
  - $1 - (\text{fact table size} / \text{product of dimensions})$
  - Fact Table 1 – *SalesFact* (combination of individual franchise, customer, sales and weeks)
    - $(1 - (510,000 / (550 * 80,000 * 52))) = 0.999778$  (approx)
    - The data cube has mostly missing cells with slightly more than 0.03% of cells with non-zero values
  - Fact Table 2 – *ServicesFact* (combination of individual franchise, customer, services and weeks)
    - $(1 - (100,000 / (550 * 80,000 * 52))) = 0.999956$  (approx)
  - The data cube has mostly missing cells with slightly more than 0.004% of cells with non-zero values.