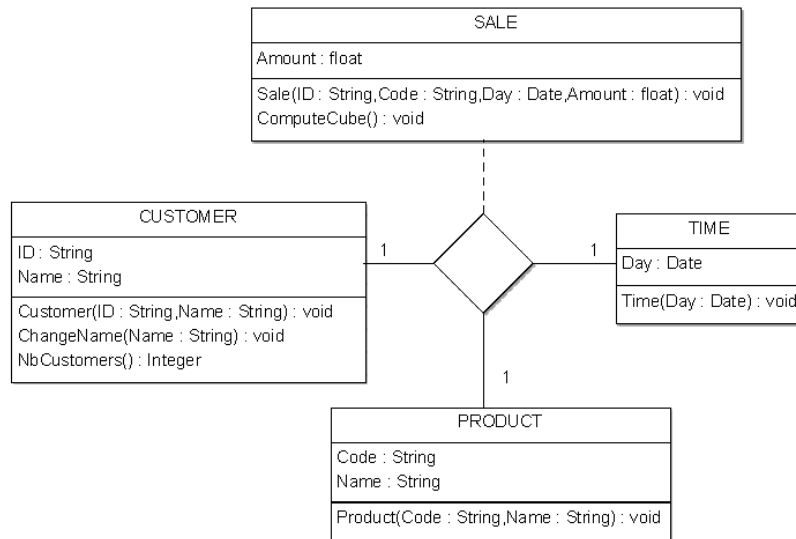


Let us consider the sample datamart whose conceptual “star” model is provided below. The objective of this labwork is to implement it within the XML-native BaseX database management system.



Exercise #1: XML Datamart creation

1. Create the XML documents that store the instances of dimensions CUSTOMER and PRODUCT (TIME is degenerate) with respect to the DTD <http://eric.univ-lyon2.fr/~jdarmont/docs/dim.dtd> reproduced below.

```
<!-- dim.dtd -->
<!ELEMENT dimension (instance+)>
<!ATTLIST dimension name CDATA #REQUIRED>
<!ELEMENT instance EMPTY>
<!ATTLIST instance id ID #REQUIRED name CDATA #REQUIRED>
```

2. Populate documents CUSTOMER and PRODUCT with the instances provided below.

| CUSTOMER | |
|----------|---------|
| ID | Name |
| Cust001 | Darmont |
| Cust002 | Lallich |
| Cust003 | Velcin |

| PRODUCT | |
|-----------|-------------|
| ID (Code) | Name |
| Pr32Blue | Blue thing |
| Pr55White | White stuff |

3. Create the XML document that stores fact instances (SALE) with respect to the DTD <http://eric.univ-lyon2.fr/~jdarmont/docs/fact.dtd> reproduced below.

```
<!-- fact.dtd -->
<!ELEMENT facts (fact+)>
<!ELEMENT fact EMPTY>
<!ATTLIST fact cust-id CDATA #REQUIRED prod-id CDATA #REQUIRED
day CDATA #REQUIRED amount CDATA "0">
```

4. Populate the SALE document with the instances provided below.

| SALE | | | |
|---------|-----------|------------|--------|
| CustID | ProdID | Day | Amount |
| Cust001 | Pr32Blue | 15-09-2011 | 575.75 |
| Cust001 | Pr55White | 15-09-2011 | 200.50 |
| Cust002 | Pr55White | 16-09-2011 | 250 |
| Cust003 | Pr32Blue | 15-09-2011 | 550 |

5. Use the Validome XML Validator (<http://www.validome.org/xml/validate/>) to check whether both CUSTOMER and PRODUCT documents are valid against dim.dtd, and whether the SALE document is valid against fact.dtd.

6. Load the three XML documents into a new BaseX database.

Exercise #2: XML Datamart interrogation with XQuery

Use XPath whenever possible, XQuery 3.0 otherwise.

- Names of (non degenerate) dimensions.
- Number of instances of dimension PRODUCT.
- Fact elements whose amount is greater than 500.
- Customer names sorted by descending alphabetical order.
- Fact list with respect to the following format:

```
<fact cust="CustomerName" prod="ProductName" day="Day" Amount="Amount" />
```
- Total amount per day.
- Average amount per customer.
- Total amount per product and per day.
- Product(s) with the highest total sale amount (best selling product).