Laboratórios de Desenvolvimento de Software - LEI
Data Access (Part I)

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Visual Database Tools

- Visual Studio allows managing databases without leaving the IDE;
- It may connect to SQL Server, Oracle, Access or any ODBC driver;
- Managed as a *Data Connection*.

Database management

- Allows the creation of edition of tables, relationships and views;
- May be done visually via database diagrams;

Data management

- Data contained in the database can also be viewed and edited;
- Can also be inspected by performing queries.

DataSets

- *DataSets* allows applications to connect to databases;
- Contains *DataTables* with *DataColumns* and *DataRows*
- Not necessarily contains the entire database
    - the user defines which data is retrieved;
- They can be weekly or strongly typed;

Weakly Typed DataSets

- Lookups are performed through string literals:
    - Very error-prone;

```
DataSet set = RetrieveData();
DataTable nontyped_entries = set.Table["Entries"];
DataRow nontyped_entry = nontyped_entries.Rows[0];
string = nontyped_entry["Description"].ToString;
```

Strongly Typed DataSets

- Every database entity is strongly typed;

```
BudgetDataSet set = RetrieveData();
BudgetDataSet.EntriesDataTable typed_entries = set.Entries;
BudgetDataSet.EntriesRow typed_entry = entries.Rows[0] as E
string = typed_entry.Description;
```

Strongly Typed DataSets

- Typed DataSets can be created manually;
- However, Visual Studio provides a wizard to help create DataSets from databases;
- Can also be edited visually in the *DataSet Designer*;

Strongly Typed DataSets

- A *TableAdapter* is created for each table;
- Allows the communication with the actual database;
- *Fill* and *GetData* methods are generated by applying a query on the database;
- Customized queries can also be created;

DataBindings

- *DataBindings* connect graphical elements to the application data;
- May connect to a database through DataSets, or any generic object;
- Relationship is two-way;

Bibliography

📕 N. Randolph, D. Gardner, M. Minutillo and C. Anderson
Professional Visual Studio 2010.
Wrox, 2010.