Meta Programming

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Resumo

- Meta Programming
- Code Generation
- AppML

Meta Programming

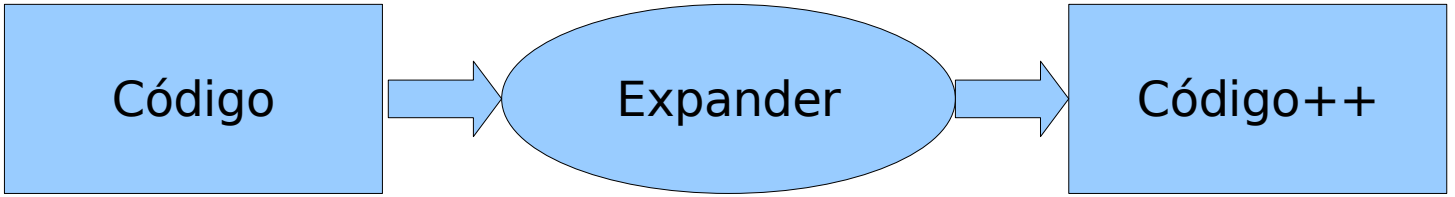
- Programas que manipulam programas
  - Geração de código
  - Em tempo de compilação
  - Ou mesmo em runtime

Vantagens

- Qualidade
- Consistência
- Produtividade
- Abstração

Inline Code Expander

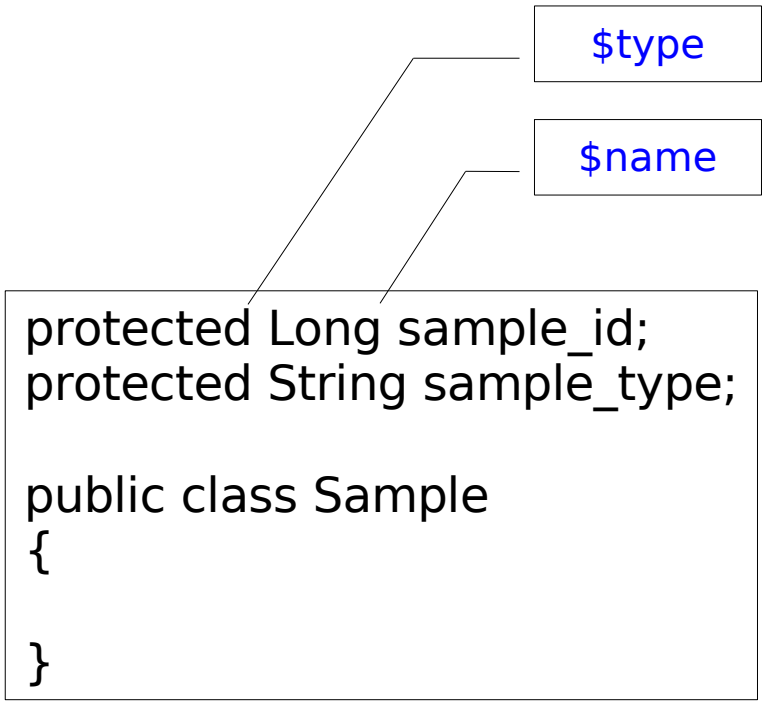
Inline Code Expander



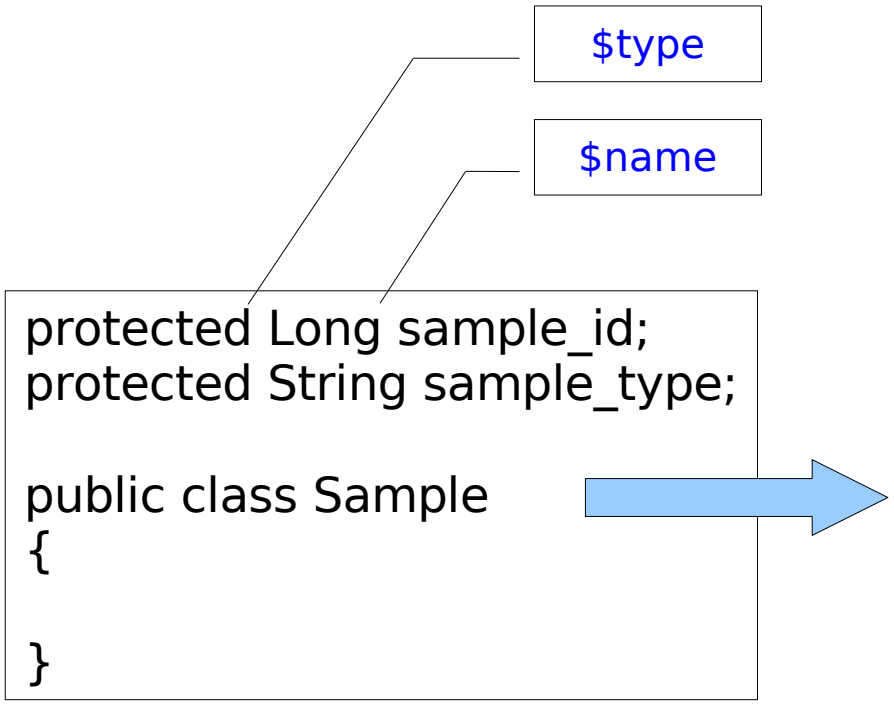
Inline Code Expander

```
protected Long sample_id;
protected String sample_type;

public class Sample
{

}
```

Inline Code Expander



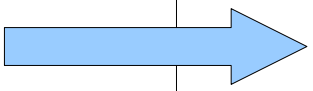
Inline Code Expander




```
public class Sample
{
   public void set_$name($type p_$name)
   {
      $name = p_$name;
   }

   public $type get_$name()
   {
      return $name;
   }
}
```

Inline Code Expander

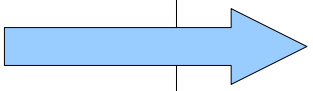
```
protected Long sample_id;
protected String sample_type;

public class Sample
{

}
```



```
public class Sample
{
   public void setSample_id(Long p_sample_id)
   {
      sample_id = p_sample_id;
   }

   public Long getSample_id()
   {
      return sample_id;
   }
}
```

Inline Code Expander

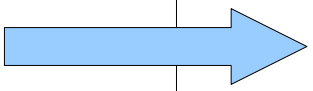
```
protected Long sample_id;
protected String sample_type;

public class Sample
{

}
```



```
public class Sample
{
   public void setSample_id(Long p_sample_id)
   {
      sample_id = p_sample_id;
   }

   public Long getSample_id()
   {
      return sample_id;
   }

   public void setSample_type(String
p_sample_type)
   {
      sample_type = p_sample_type;
   }

   public String getSample_type()
   {
      return sample_type;
   }
}
```

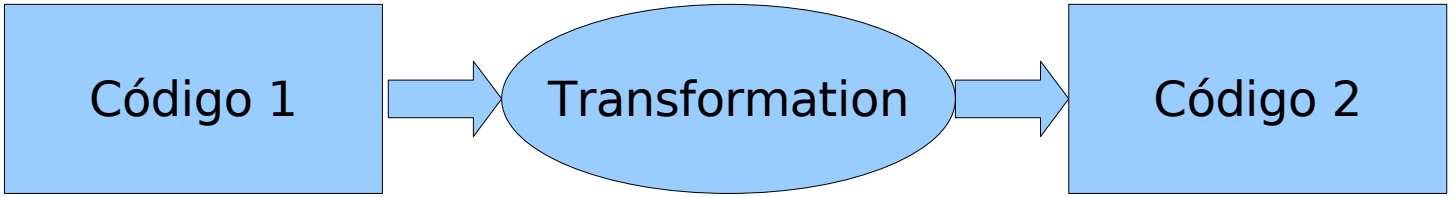
Inline Code Expander

```
protected Long sample_id;
protected String sample_type;

public class Sample
{

}
```



```
protected Long sample_id;
protected String sample_type;

public class Sample
{
   public void setSample_id(Long p_sample_id)
   {
      sample_id = p_sample_id;
   }

   public Long getSample_id()
   {
      return sample_id;
   }

   public void setSample_type(String
p_sample_type)
   {
      sample_type = p_sample_type;
   }

   public String getSample_type()
   {
      return sample_type;
   }
}
```

Code Transformation



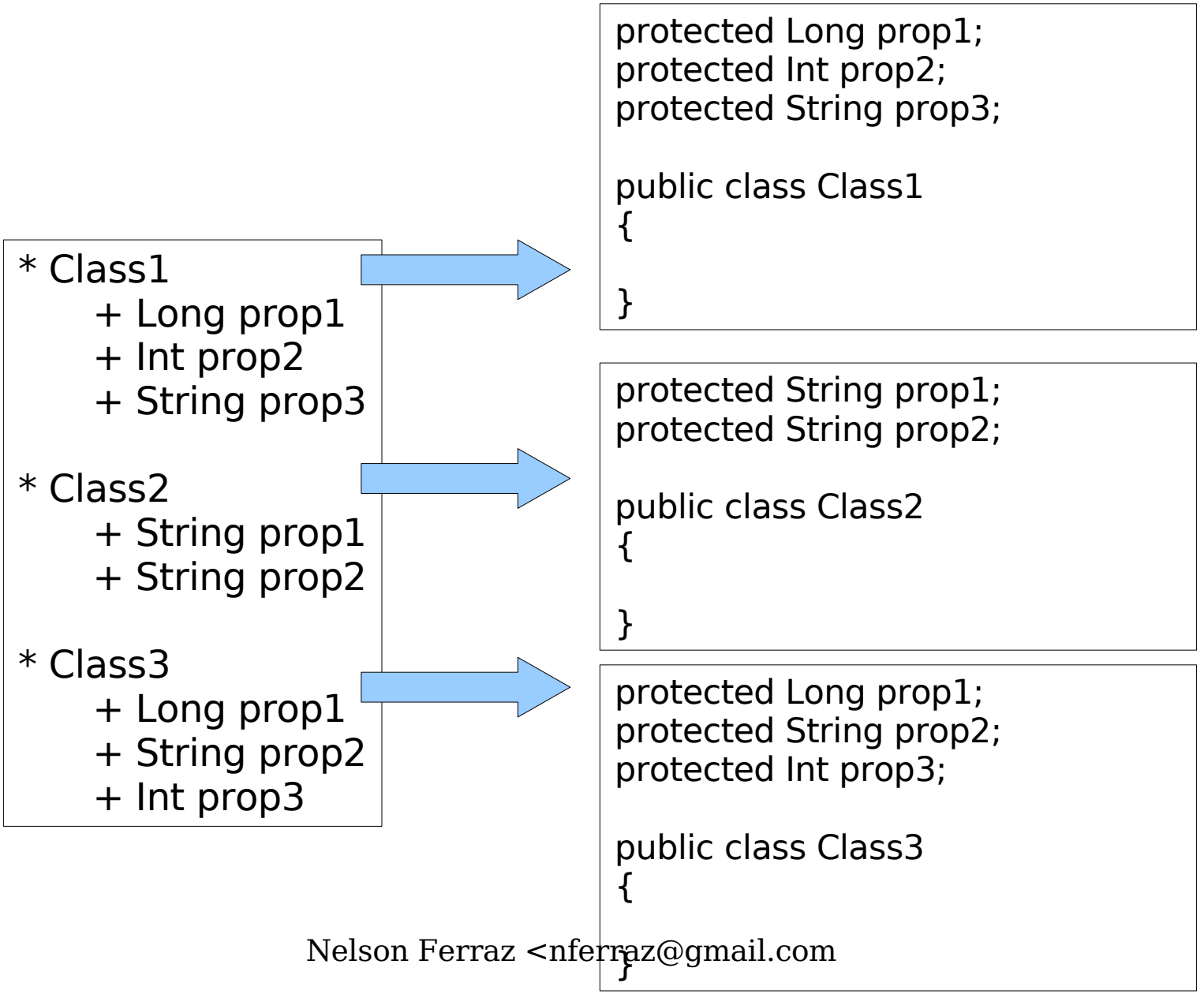
Code Transformation

* Class1
    + Long prop1
    + Int prop2
    + String prop3

* Class2
    + String prop1
    + String prop2

* Class3
    + Long prop1
    + String prop2
    + Int prop3

Code Transformation



“Filosofia Unix”

- Ferramentas pequenas
- Fazem apenas uma coisa (e bem)
- Funcionam como filtros: lêem textos e escrevem textos

“Filosofia Unix”


```
* Class1
      + Long prop1
      + Int prop2
      + String prop3

* Class2
      + String prop1
      + String prop2

* Class3
      + Long prop1
      + String prop2
      + Int prop3
```

```
protected Long
prop1;
protected Int prop2;
protected String
prop3;

public class Class1
{

}
```

```
protected Long sample_id;
protected String sample_type;

public class Class1
{
   public void setSample_id(Long p_sample_id)
   {
      sample_id = p_sample_id;
   }

   public Long getSample_id()
   {
      return sample_id;
   }

   public void setSample_type(String
p_sample_type)
   {
      sample_type = p_sample_type;
   }

   public String getSample_type()
   {
      return sample_type;
   }
```

“Filosofia Unix”

* Class1
    + Long prop1
    + Int prop2
    + String prop3

* Class2
    + String prop1
    + String prop2

* Class3
    + Long prop1
    + String prop2
    + Int prop3

```
protected Long sample_id;
protected String sample_type;

public class Class1 {
{
   public void setSample_id(Long p_sample_id)
   {
      sample_id = p_sample_id;
   }

   public Long getSample_id()
   {
      return sample_id;
   }

   public void setSample_type(String
p_sample_type)
   {
      sample_type = p_sample_type;
   }

   public String getSample_type()
   {
      return sample_type;
   }
}
```

* Class1
    + Long prop1
    + Int prop2
    + String prop3

* Class2
    + String prop1
    + String prop2

* Class3
    + Long prop1
    + String prop2
    + Int prop3

```
CREATE TABLE Class1 (
        prop1 type1,
        prop2 type2,
        prop3 type3,
);

CREATE TABLE Class1 (
        prop1 type1,
        prop2 type2,
);

CREATE TABLE Class1 (
        prop1 type1,
        prop2 type2,
        prop3 type3,
);
```

* Class1
    + Long prop1
    + Int prop2
    + String prop3

* Class2
    + String prop1
    + String prop2

* Class3
    + Long prop1
    + String prop2
    + Int prop3

class1.html

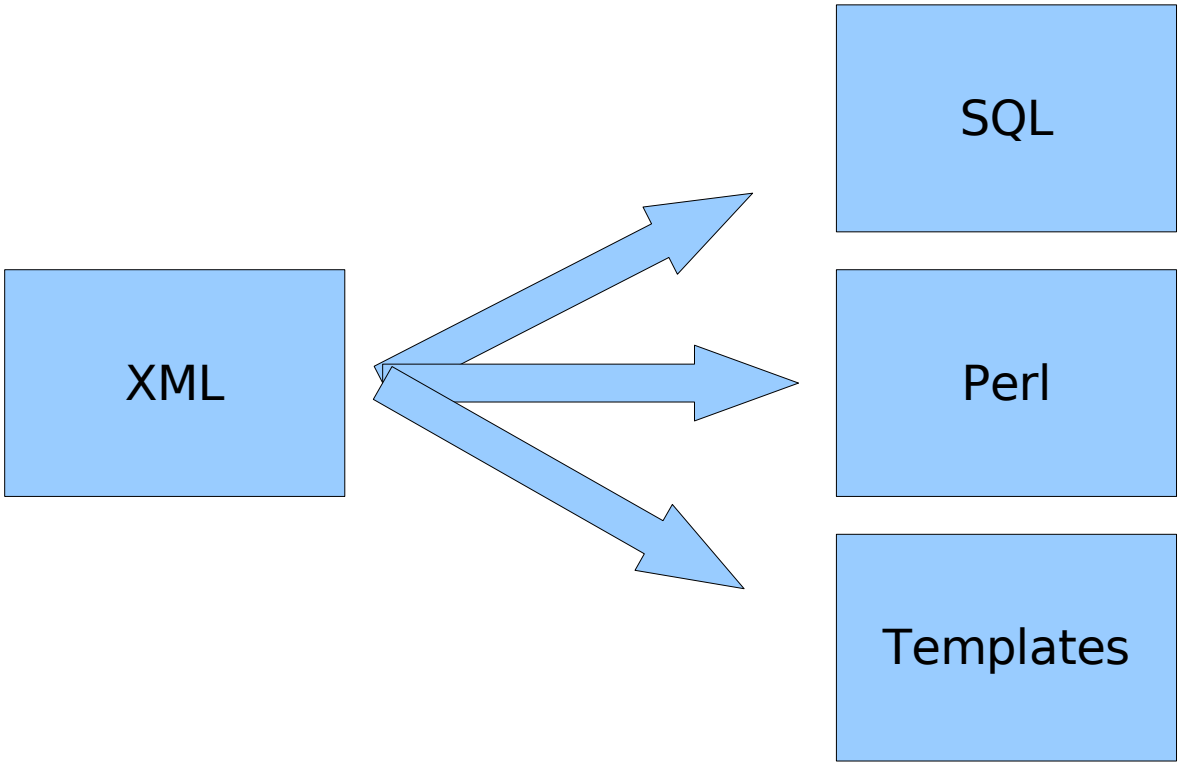
```
<h1>Class1</h1>

<form>
        prop1: <input name=”prop1”
type=”text” size=”40”/>
        prop2: <input name=”prop2”
type=”text” size=”40”/>
        prop3: <input name=”prop3”
type=”text” size=”40”/>
</form>
```

class2.html

```
<h1>Class2</h1>

<form>
        prop1: <input name=”prop1”
type=”text” size=”40”/>
        prop2: <input name=”prop2”
type=”text” size=”40”/>
</form>
```

AppML

- Application Markup Language
- Uma fonte, múltiplas saídas:



AppML

- agenda.xml

```
<project name=”agenda”>

</project>
```

AppML

- agenda.xml

```
<project name=”agenda”>
    <table name=”contato”>
    </table>
</project>
```

AppML

- agenda.xml

```
<project name=”agenda”>

    <table name=”contato”>

        <field name=”nome”/>
        <field name=”endereco”/>
        <field name=”telefone”/>

    </table>

</project>
```

AppML

- agenda.xml

```
<project name=”agenda”>

    <table name=”contato”>

        <field name=”nome” type=”varchar” size=”40”/>
        <field name=”endereco” type=”varchar”
size=”40”/>
        <field name=”telefone” type=”varchar” size=”40”/>

    </table>

</project>
```

AppML

- agenda.xml

```
<project name=”agenda”>

    <table name=”contato”>
        <field name=”nome” type=”varchar” size=”40”/>
        <field name=”endereco” type=”varchar”
size=”40”/>
    </table>

    <table name=”telefone”>
        <rel name=”pessoa” table=”contato”/>
        <field name=”telefone” type=”varchar” size=”40”/>
    </table>

</project>
```

AppML

- create.sql

```
CREATE TABLE contato (
    id serial primary key,
    nome varchar(40),
    endereco varchar(40),
    created timestamp DEFAULT NOW(),
    updated timestamp,
    deleted timestamp
);

CREATE TABLE telefone (
    id serial primary key,
    pessoa int references contato,
    telefone varchar(40),
    created timestamp DEFAULT NOW(),
    updated timestamp,
    deleted timestamp
);
```

AppML

- view.sql

```
CREATE VIEW view_telefone AS
  SELECT
    telefone.telefone,
    telefone.pessoa,
    pessoa.nome AS pessoa_nome,
    pessoa.endereco AS pessoa_endereco
  FROM telefone
    LEFT JOIN contato ON (contato.id = telefone.pessoa);
```

AppML

- frm_telefone.tt2

```
(...)

<form method="post" action="[% url %]/agenda/telefone/list_telefone"
onSubmit="return(Validation())">
<input type="hidden" name="action" value="[% todo_action %]">
<input type="hidden" name="table" value="telefone">
<input type="hidden" name="id" value="[% my_telefone.id() %]">

<table>

<tr>
  <th class="frm"></th>
  <td class="frm">
    <select name="pessoa">
      <option value="">____________________</option>
[% FOREACH row = list_contato %]
      <option value="[% row.id() %]" [% "selected" IF my_telefone.pessoa() == row.id() %]> [% row.() %]
[% END %]
    </select>
[% IF (show_insert_contato == 1) %]
  <a href="[% url %]/agenda/contato/frm_contato?todo_action=create">insert</a>
[% END %]
  </td>
</tr>

(...)
```

AppML

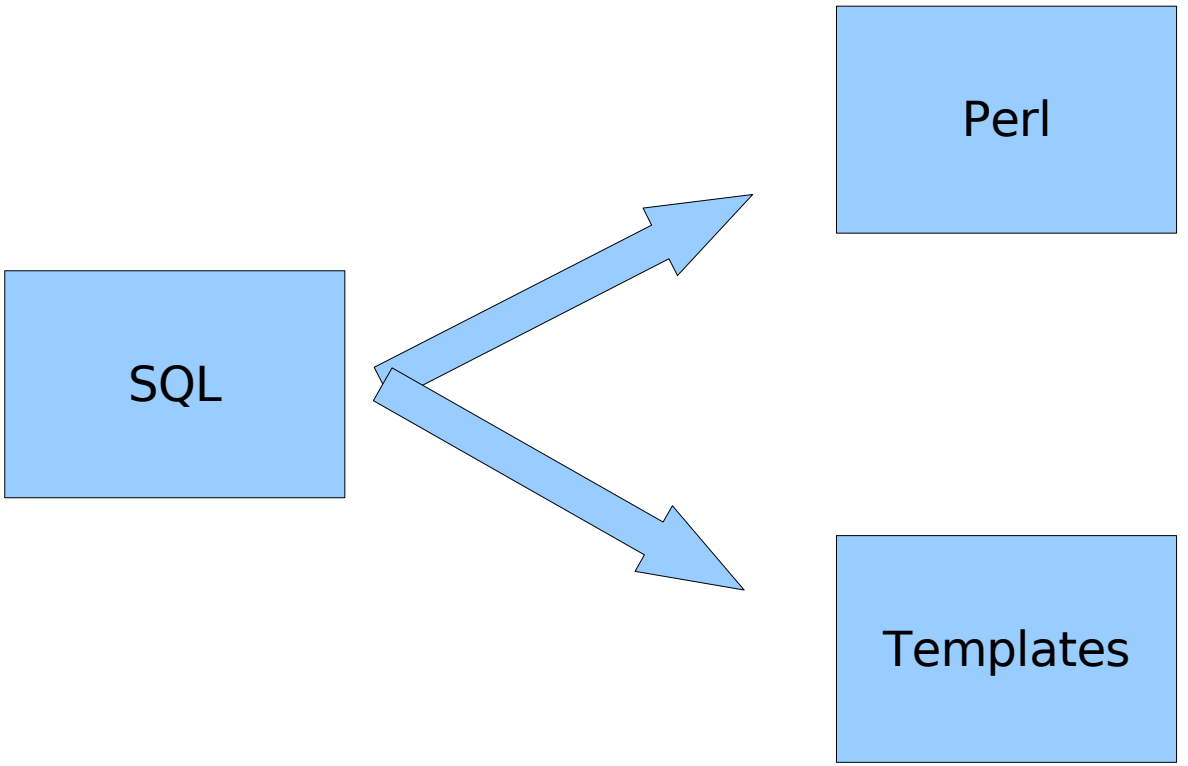
- telefone.pm

```
package agenda::cdbi::telefone;

# Project:
# Module:
# Date:

use strict;
use base qw( agenda::cdbi );

__PACKAGE__->table('telefone');

__PACKAGE__->columns(All => qw(id pessoa telefone));

__PACKAGE__->has_a(pessoa => 'agenda::cdbi::pessoa');

__PACKAGE__->sequence('telefone_id_seq');

1;
```

SQL::Translator

- Extrai informações diretamente do SQL
- Pode ser extendido através de Producers

SQL::Translator::Producer::App



SQL::Translator::Producer::App