

What is DBC?

- Classes of a system communicate with one another on the basis of precisely defined benefits and obligations.

[Bertrand Meyer, CACM, Vol. 36, No 9, 1992]

What is DBC? (cont.)

- **Preconditions of methods**
A boolean expression which is assumed true when the method gets called
- **Postconditions of methods**
A boolean expression which the caller can assume to be true when the method returns
- **Class invariants**
consistency conditions of objects
must hold for all instances

Preconditions, Postconditions and Class Invariants (cont.)

<http://archive.eifel.com/doc/manuals/technology/contract/pafe.html>

e.g., inserting a certain element into a dictionary
 (a table where each element is identified
 by a certain character string used as key) of bounded capacity.

```

put (x: ELEMENT; key: STRING) is
    -- Insert x so that it will be retrievable through key.
    require
        count <= capacity
        not key.empty
    do
        ... Some insertion algorithm ...
    ensure
        has (x)
        item (key) = x
        count = old count + 1
    end
  
```

The Notion of Contract

<http://archive.eifel.com/doc/manuals/technology/contract/pafe.html>

○ **Obligations**
(Must ensure precondition)

Make sure table is not full and key is a non-empty string.

(Must ensure postcondition)

Record given element in table, associated with given key.

○ **Benefits**
(May benefit from postcondition)

Get updated table where the given element now appears, associated with the given key.

(May assume precondition)

No need to do anything if table is full, or key is empty string.

Client

Supplier

The Notion of Contract (cont.)

<http://archive.eifel.com/doc/manuals/technology/contract/pafe.html>

○ Obligations

○ Benefits

Client

- Satisfy preconditions

- No need to check output values
- Result guaranteed to comply to postcondition

Supplier

- Satisfy postconditions

- No need to check input values
- Input guaranteed to comply to precondition

Current Existing Tools (cont.)

- JDK1.4: assert
- Eiffel
<http://archive.eiffel.com>
- iContract
by Reto Kramer, Cambridge Technology Partners
- JASS
<http://semantik.informatik.uni-oldenburg.de/~jass/>
- JMSAssert
by man machine systems
<http://www.mmsindia.com/JMSAssert.html>
- Jtest and Jcontract
by parasoft
<http://www.parasoft.com>