ITDevCon
Delphi European Conference

Going Functional

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bit Time software

Functional programming

Functional programming

- Computation = evaluation of (mathematical) functions
- Based on lambda calculus

- No state
- No mutable data
- No side effects

Functional vs. imperative

- Imperative programming
  - Functions can have side effects
- Functional programming
  - Output depends only on the input arguments

Functional programming

- Immutable variables
- Pattern matching
- Higher-order functions
- Recursion

Functional programming in Delphi

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Functional programming in Delphi

- Immutable variables - hard
- Pattern matching – if / case
- Higher-order functions – anonymous methods
- Recursion – plain old pascal

Anonymous methods

- Nameless methods
- Can be stored in a variable, field, passed as parameter …

- Internally implemented as an interface

Anonymous methods

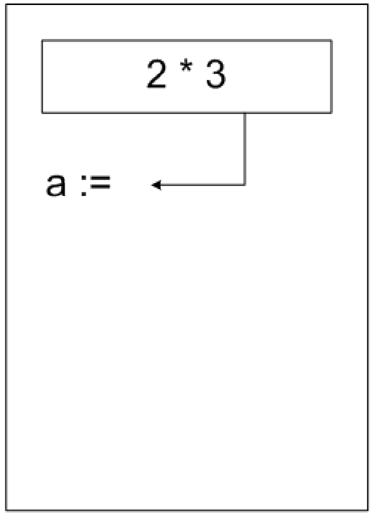
- Binding variable values
- Easy way to define and use methods
- Easy to parameterize using code

- http://docwiki.embarcadero.com/RADStudio/en/Anonymous_Methods_in_Delphi

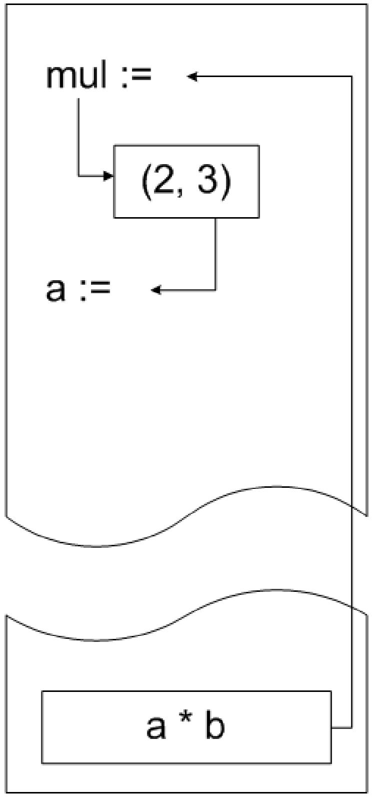
Hands-on

Inline versus anonymous

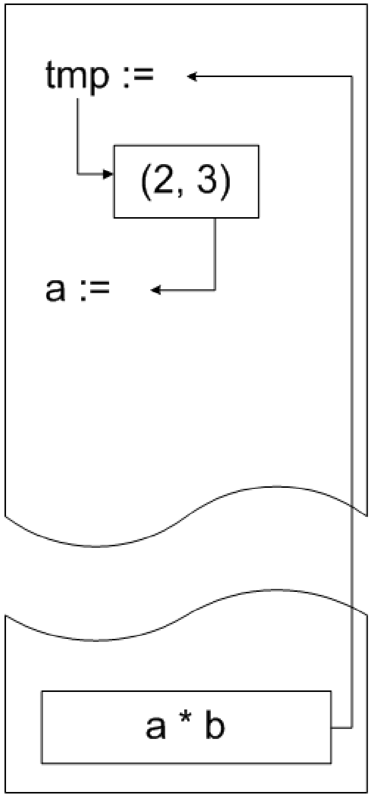
```
a := 2 * 3;
```



```
mul := Multiply();
a := mul(2, 3);
```



```
a := Multiply()(2, 3);
```



Reversing a list in Haskell

```
reverse :: [a] -> [a]
reverse [] = []
reverse (x:xs) = reverse xs ++ [x]
```

Fibonacci sequence in Haskell

```
fibRecurrence first second = first :
  fibRecurrence second (first + second)
fibonacci = fibRecurrence 0 1
main = print (fibonacci !! 10)
```

Questions?