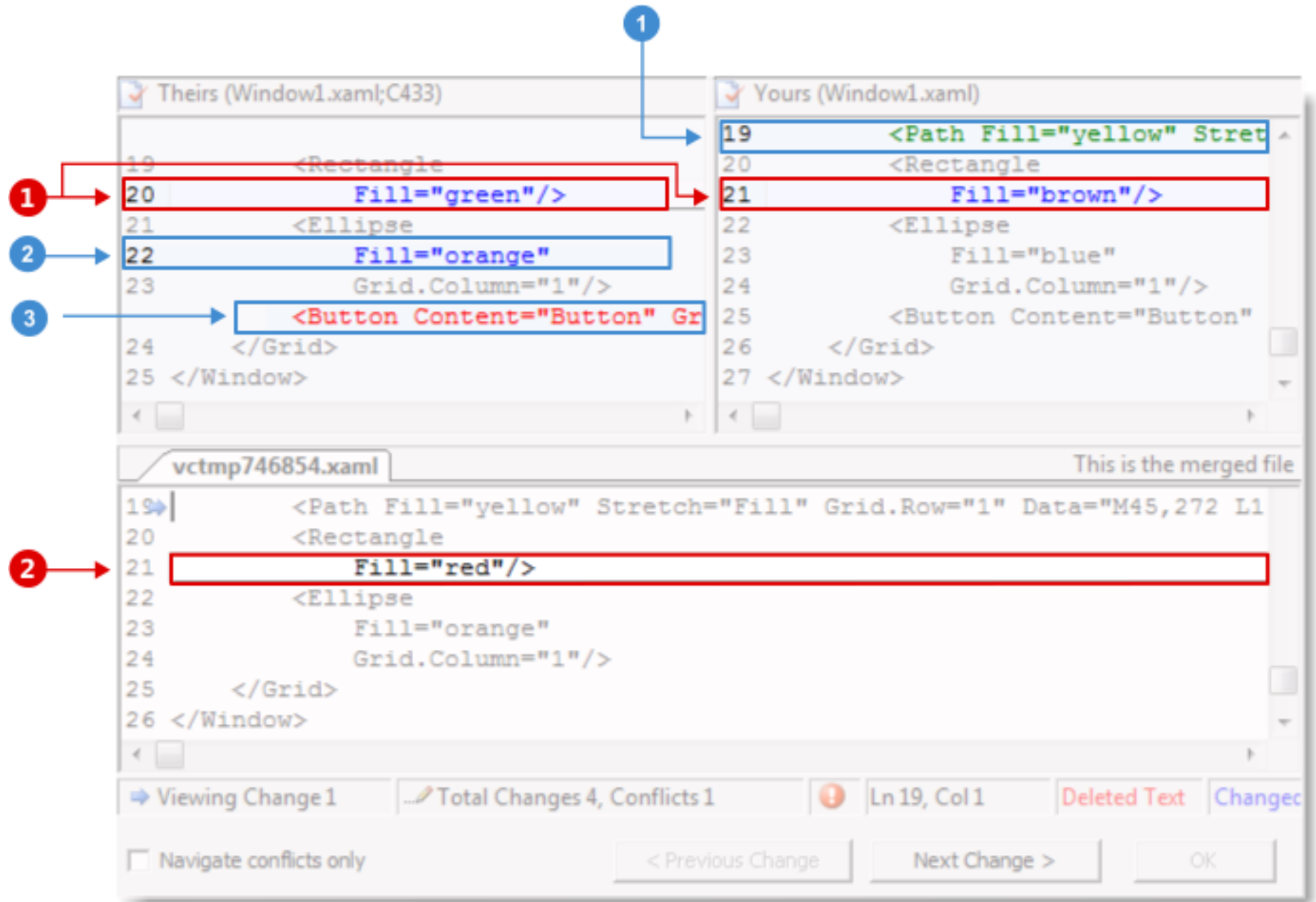


Schneller im Team entwickeln mit **Komponentenorientierung**

Stefan Lieser

stefan@lieser-online.de



1

2

3

Theirs (Window1.xaml;C433)

19 <Rectangle
20 Fill="green"/>
21 <Ellipse
22 Fill="orange"
23 Grid.Column="1"/>
24 <Button Content="Button" Gr
25 </Grid>
26 </Window>

Yours (Window1.xaml)

19 <Path Fill="yellow" Stret
20 <Rectangle
21 Fill=
22 <Ell
23
24
25 on"

vctmp746854.xaml

19 <Path
20
21
22

This is the merged file

Row="1" Data="M45,272 L1

Total Changes 4, Conflicts 1

Ln 19, Col 1

Deleted Text

Change

Navigate conflicts only

< Previous Change

Next Change >

OK

Merge Konflikte

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

NOT DONE

IN PROGRESS

READY FOR TEST

DONE

HARRIS
NATIVE PLUS PLUS FRAMEWORK
[Sticky notes with details]

RAVEN
[Sticky notes with details]

FOOSE
[Sticky notes with details]

BUILD SERVER
[Sticky notes with details]

LOIS
[Sticky notes with details]

TAP FACTORY
[Sticky notes with details]

DOG
[Sticky notes with details]

KONNERT
[Sticky notes with details]

LEOPARD
[Sticky notes with details]

TOM
[Sticky notes with details]

[Large red oval highlighting the IN PROGRESS column with various sticky notes]

[READY FOR TEST column with sticky notes]

[DONE column with sticky notes]



NOT
DONE

IN
PROGRESS

READY
FOR
TEST

DONE

HARRIS NATIVE PLUS 1919 FRAMEWORK

RAVEN BURNING 1

FOUR 1/8

BUILD SERVER

LOVE

TAP FACTORY

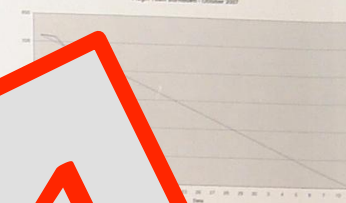
DEB 10/10/10

KONNEKT

LEOPARD

TOM

Project Team Burndown - October 2007



WIP Limit > 1

NOT
DONE

IN
PROGRESS

READY
FOR
TEST

DONE

HARBOUR NATURE PLUS 1919 FRAMEWORK

Work In Progress

LOGO

TAP FACTORY

DEB

KONNEKT

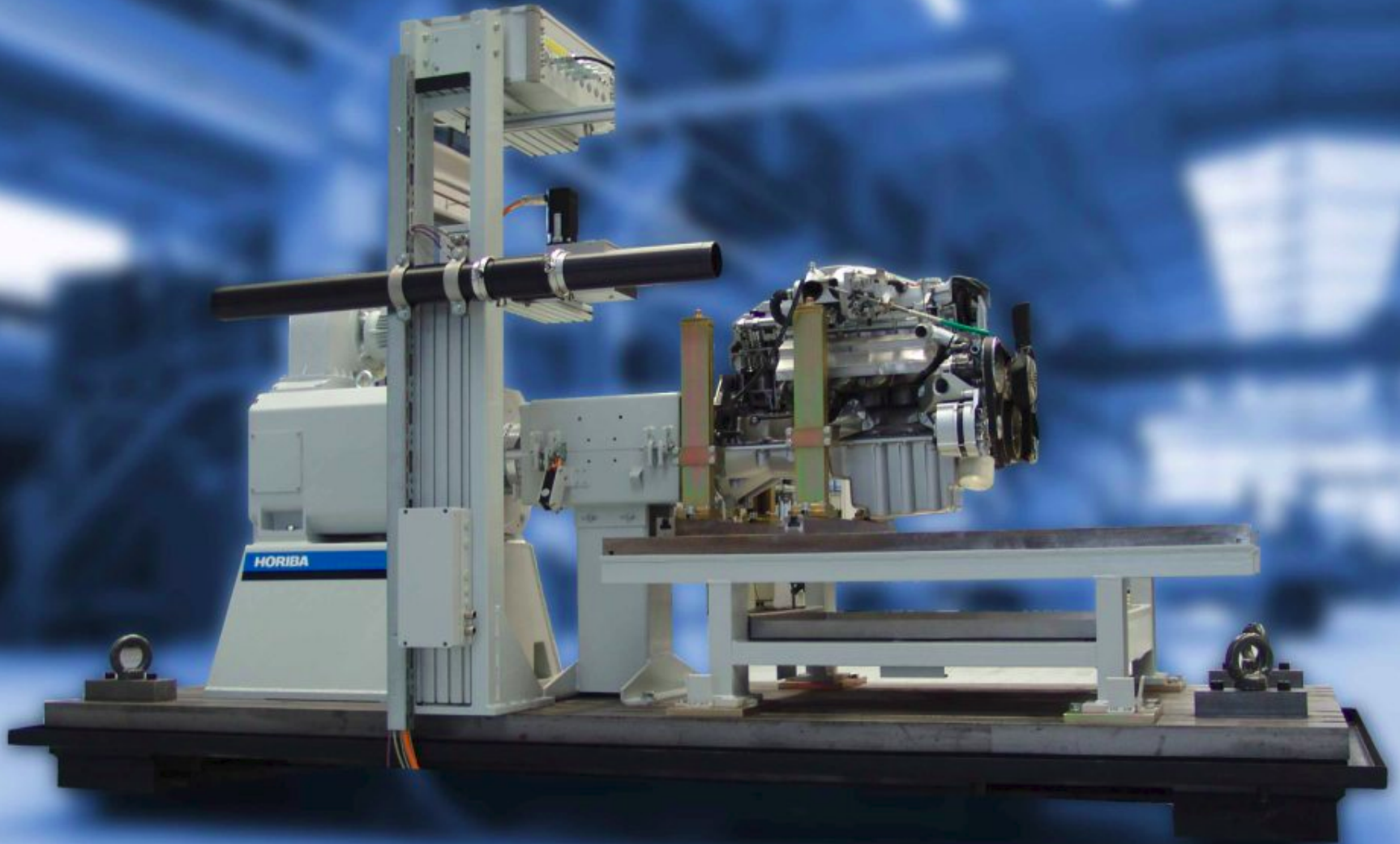
LEOPARD

TOM

IN PROGRESS

READY FOR TEST

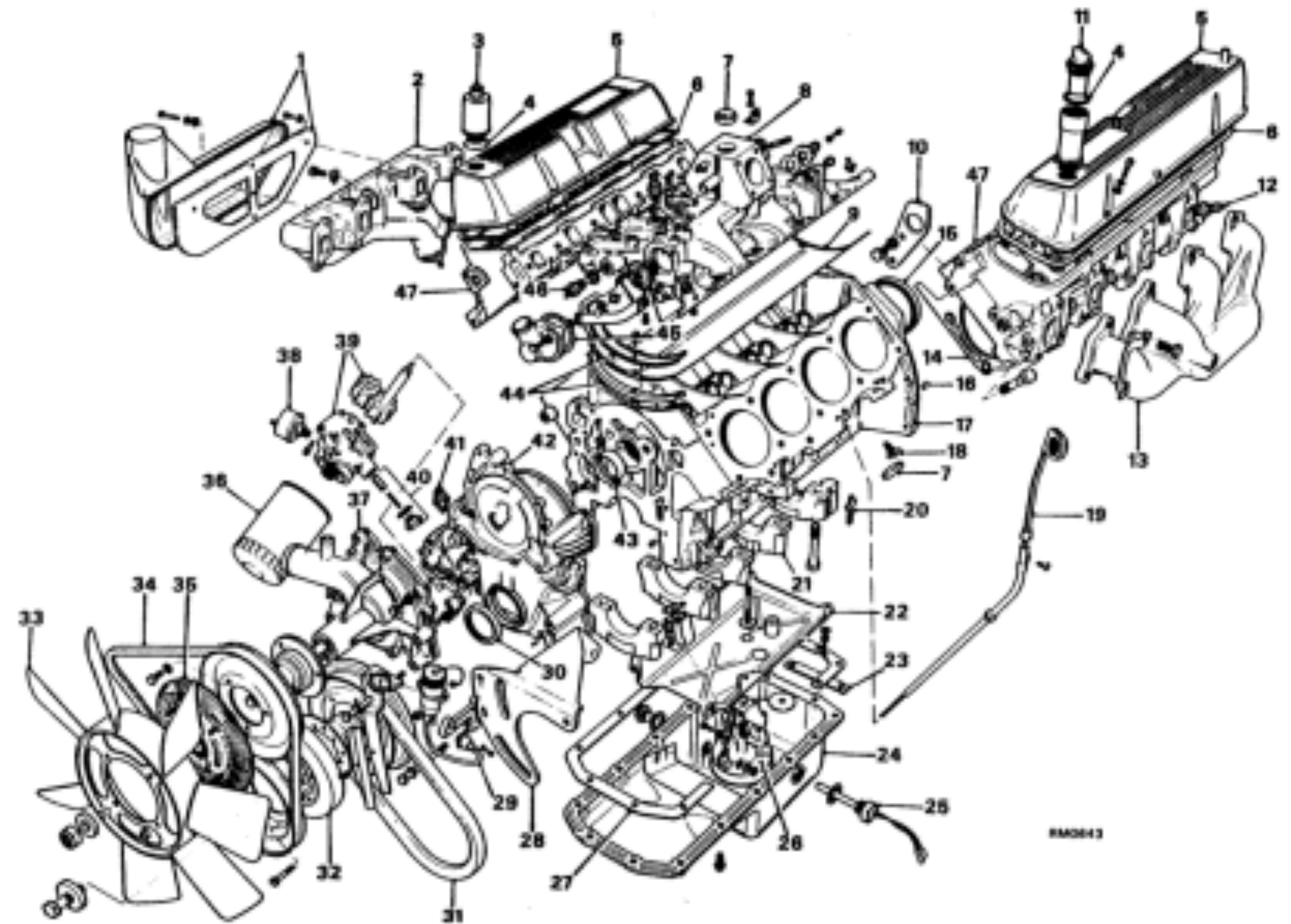
DONE

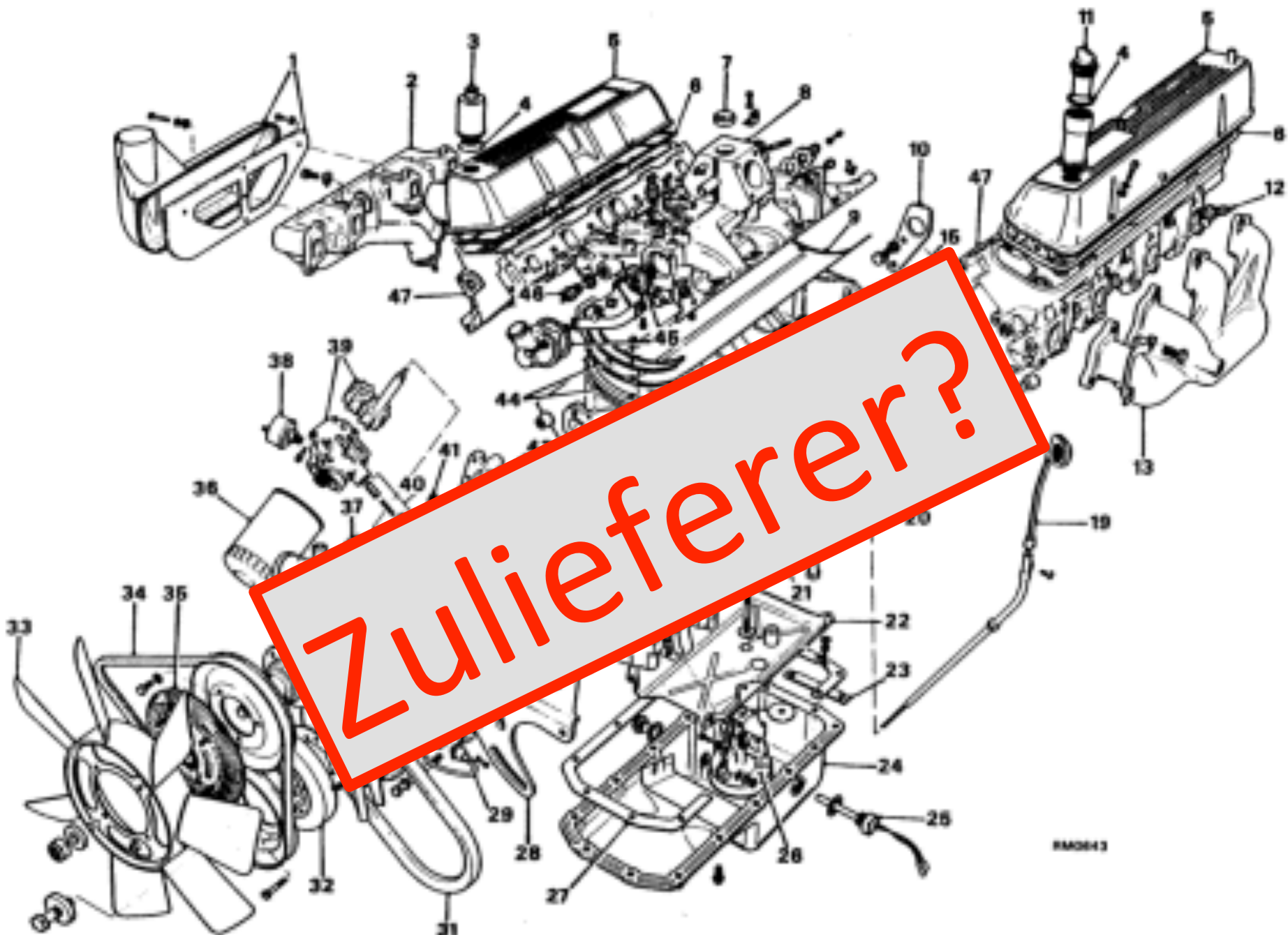


HORIBA



Prüfstände?





8MA0643





Arbeitsteilung?

“ adding manpower to
a late software
project makes it later

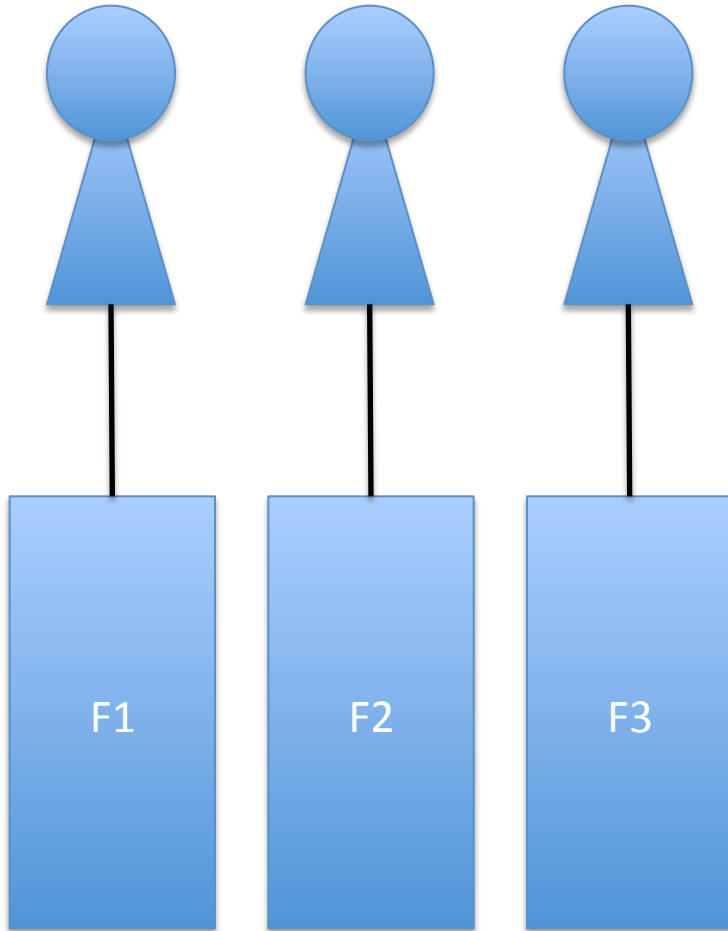
Fred Brooks, *The Mythical Man Month*, 1975



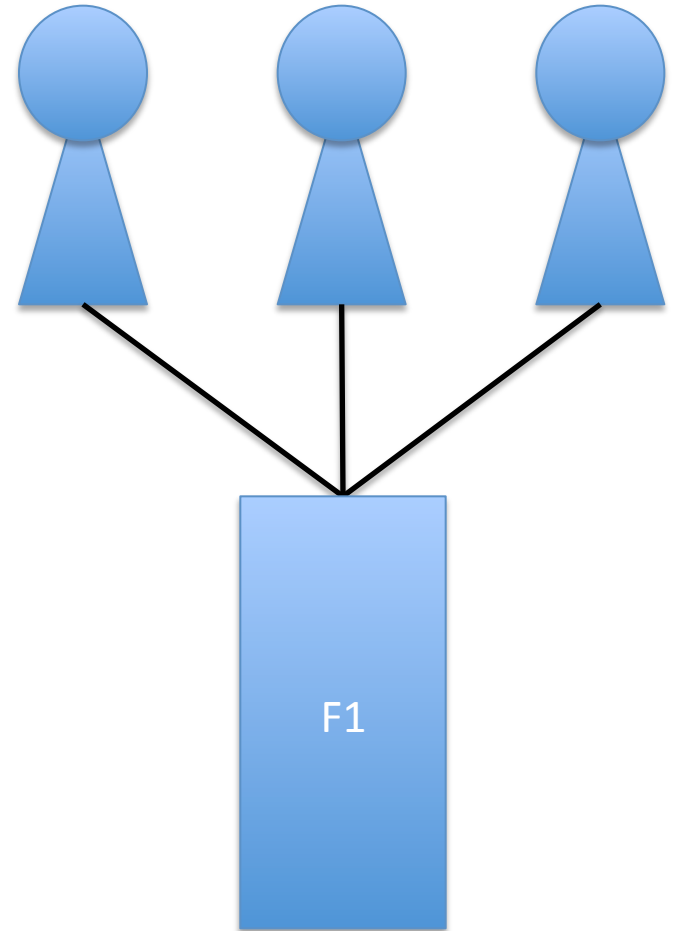
adding manpower to
a late software
project makes it later

Fred Brooks, *The Mythical Man Month*, 1975

Feature Developer



Feature Team

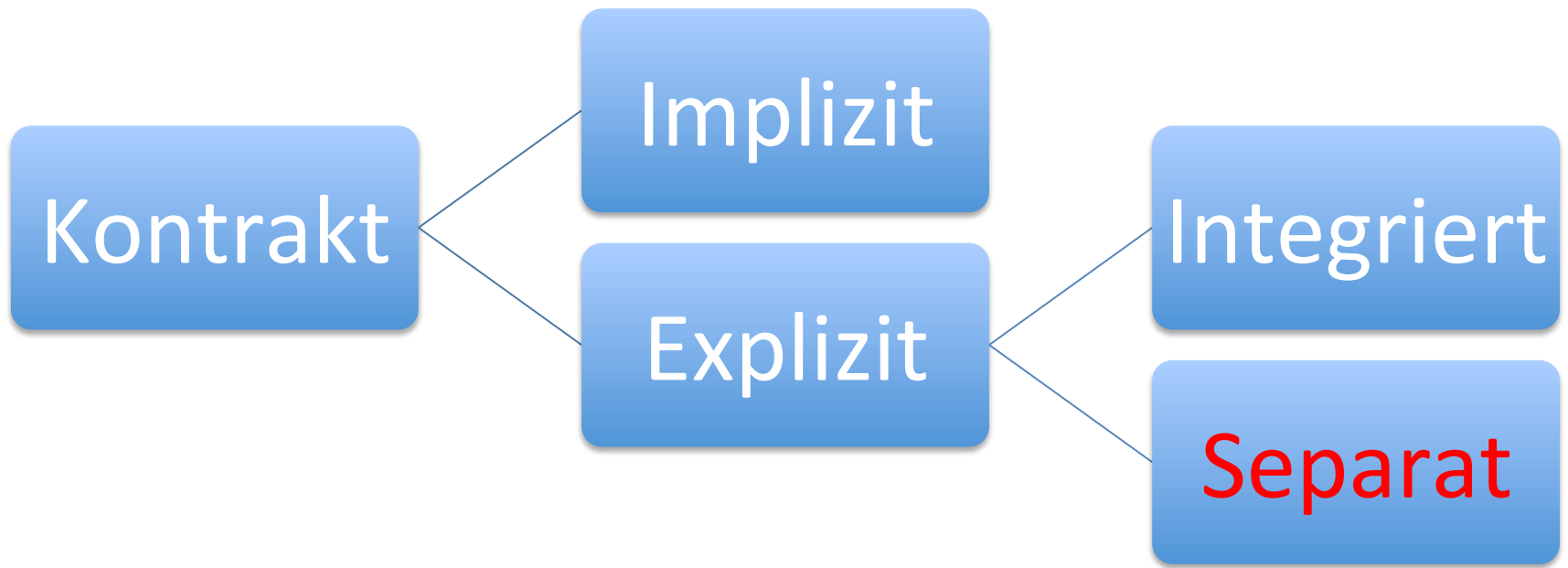


Komponenten



Eine **Komponente** ist
eine binäre
Funktionseinheit mit
separatem Kontrakt.





Implizit

```
public int Add(int x, int y) {  
    return x + y;  
}
```

```
public class Foo {  
    public void Bar() { ... }  
}
```

Explizit

```
public interface IFoo {  
    void Bar();  
}
```

```
public class Foo : IFoo {  
    public void Bar() { ... }  
}
```

Integriert

MyAssembly

```
public interface IFoo {  
    void Bar();  
}
```

```
public class Foo : IFoo {  
    public void Bar() { ... }  
}
```

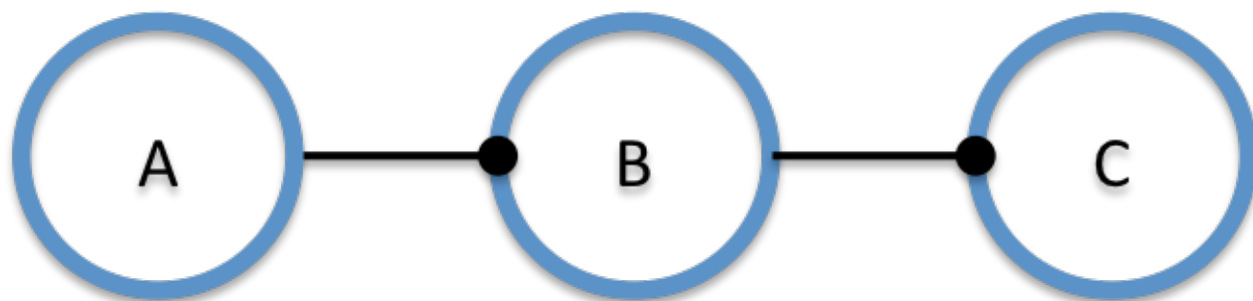
Separat

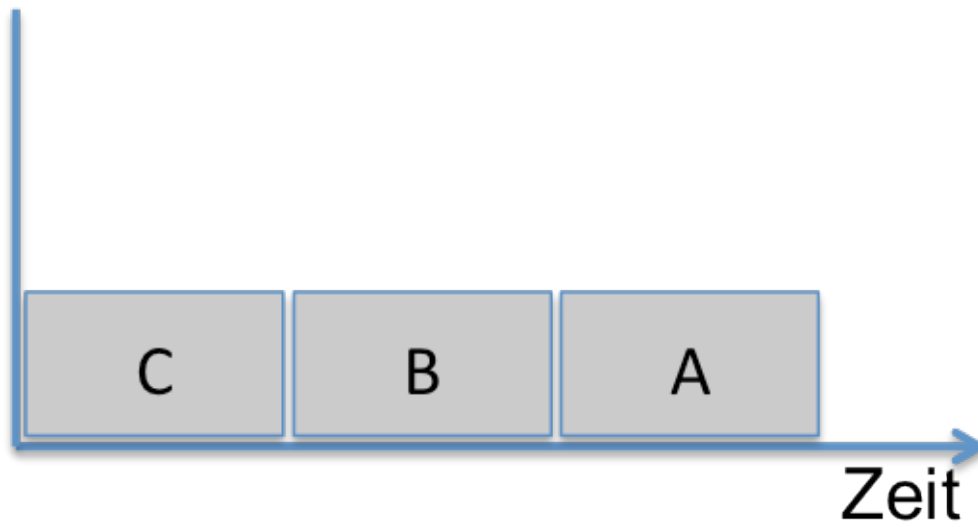
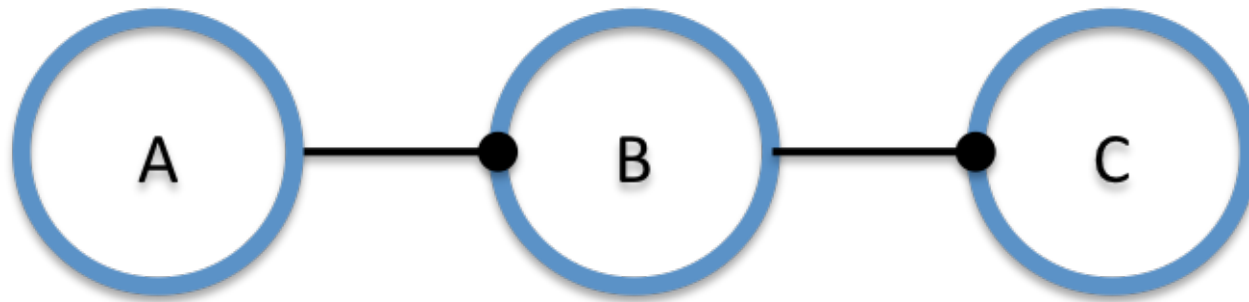
MyAssembly.Contracts

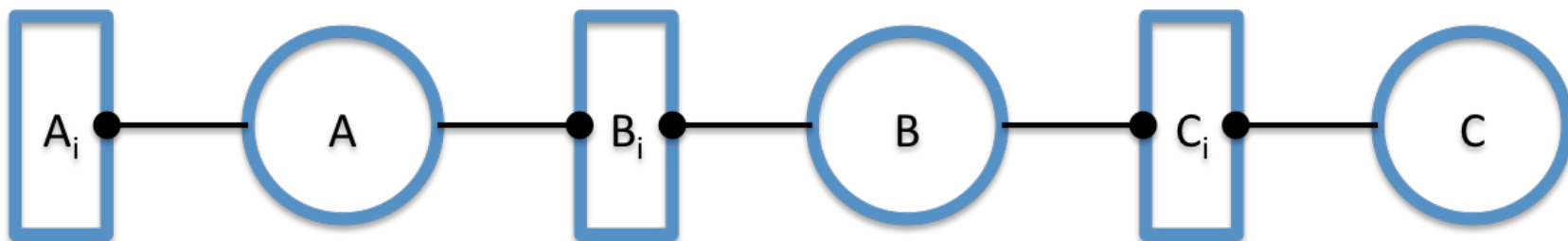
```
public interface IFoo {  
    void Bar();  
}
```

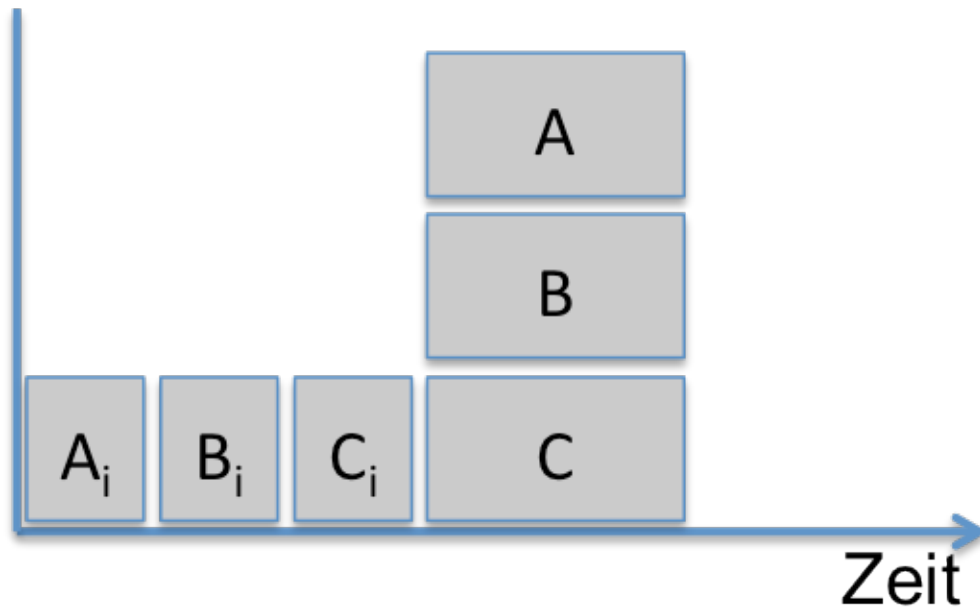
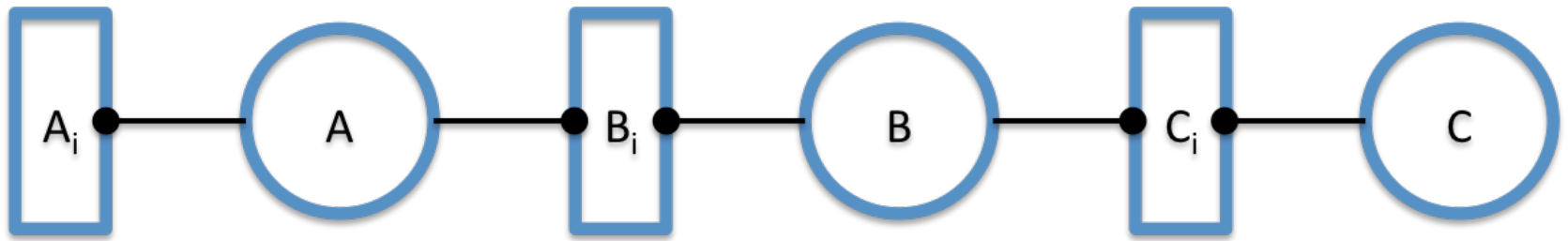
MyAssembly

```
public class Foo : IFoo {  
    public void Bar() { ... }  
}
```

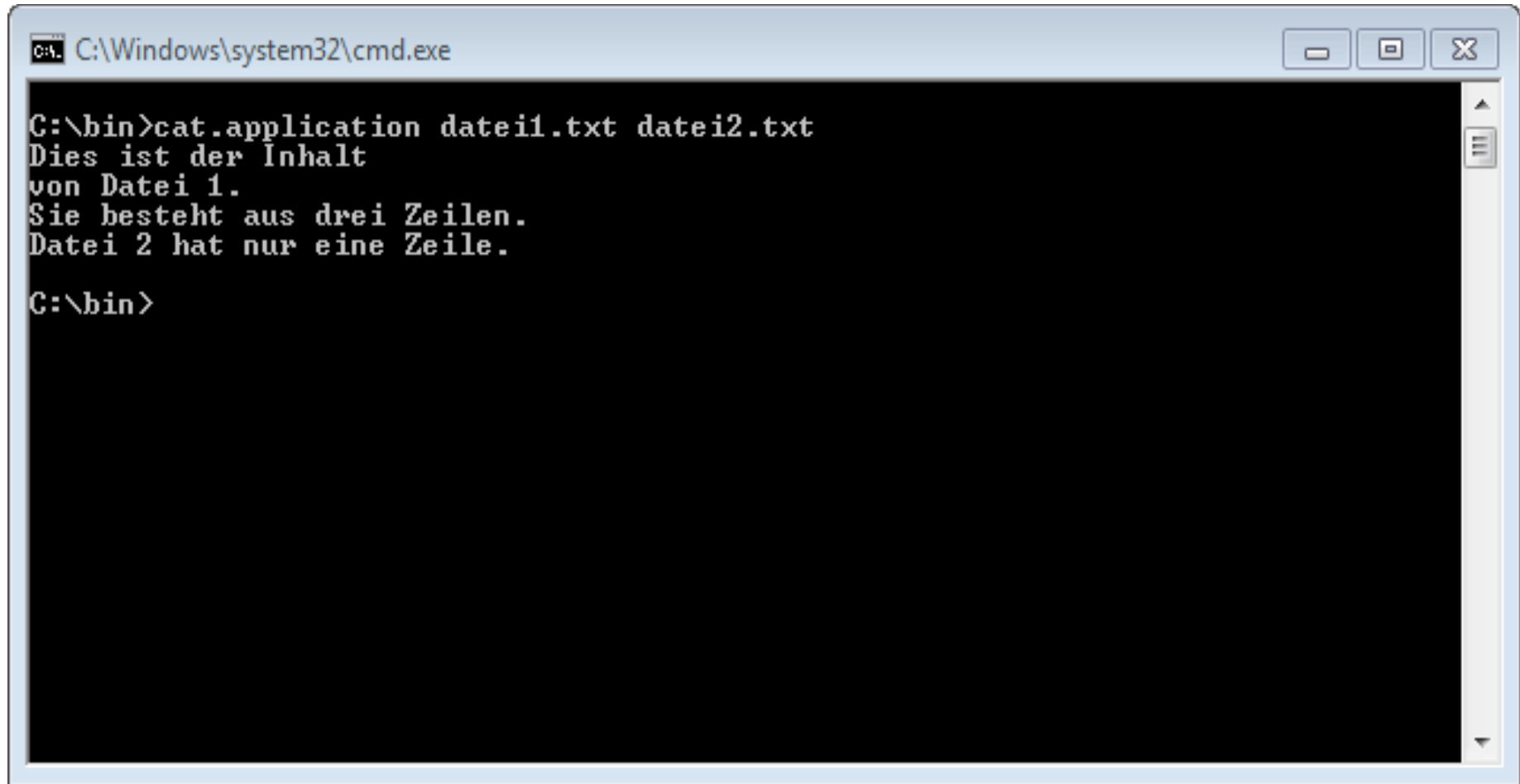









Beispiel: cat

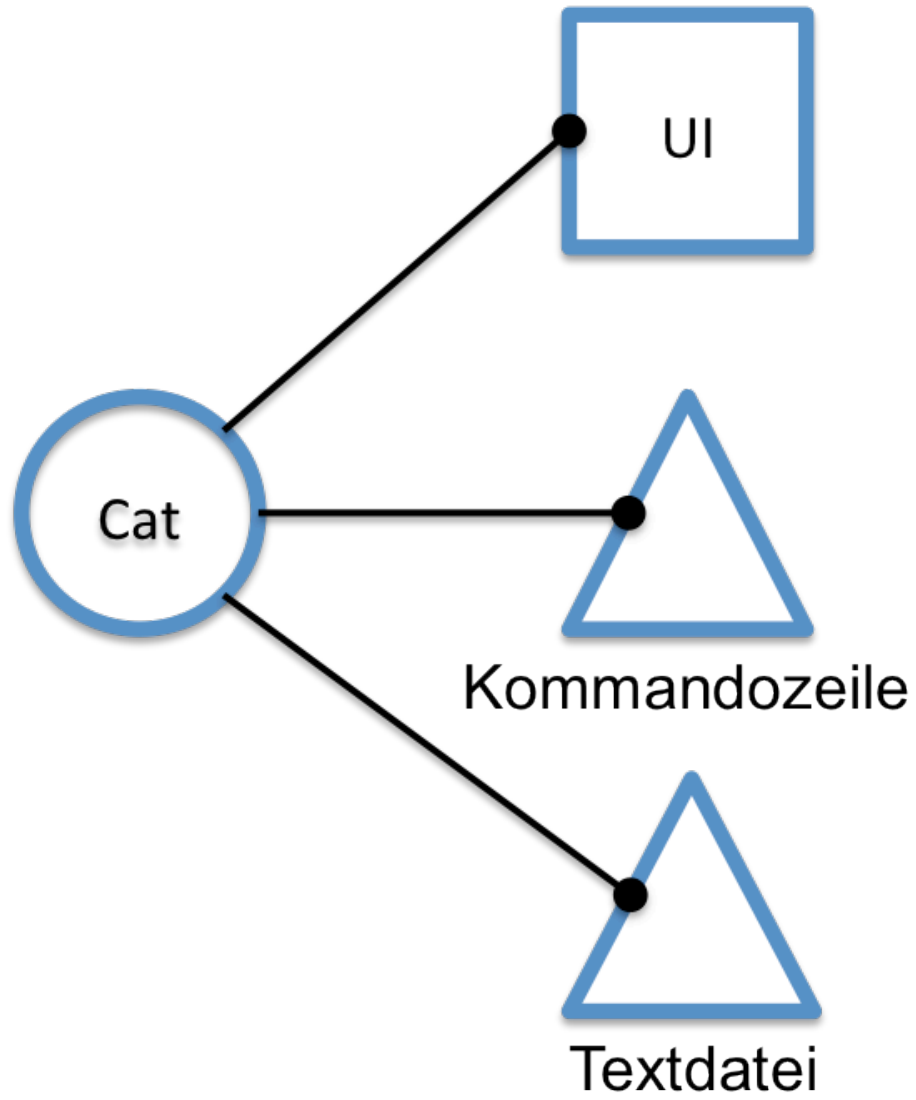


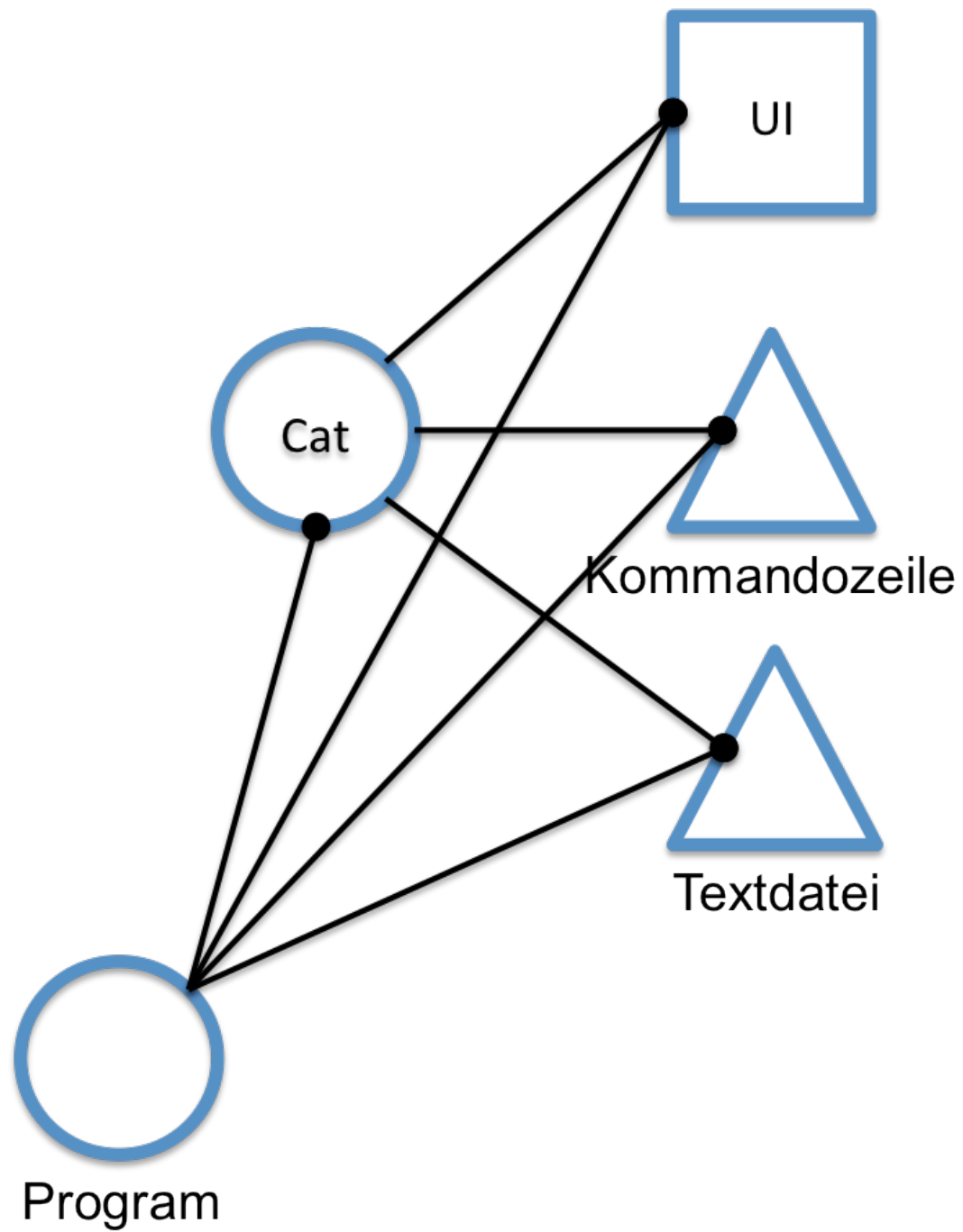
A screenshot of a Windows command prompt window. The title bar at the top reads "C:\Windows\system32\cmd.exe". The command prompt shows the command `C:\bin>cat.application datei1.txt datei2.txt` being executed. The output of the command is displayed on the next four lines: `Dies ist der Inhalt`, `von Datei 1.`, `Sie besteht aus drei Zeilen.`, and `Datei 2 hat nur eine Zeile.`. The prompt then returns to `C:\bin>`. The window has a standard Windows interface with minimize, maximize, and close buttons in the top right corner.

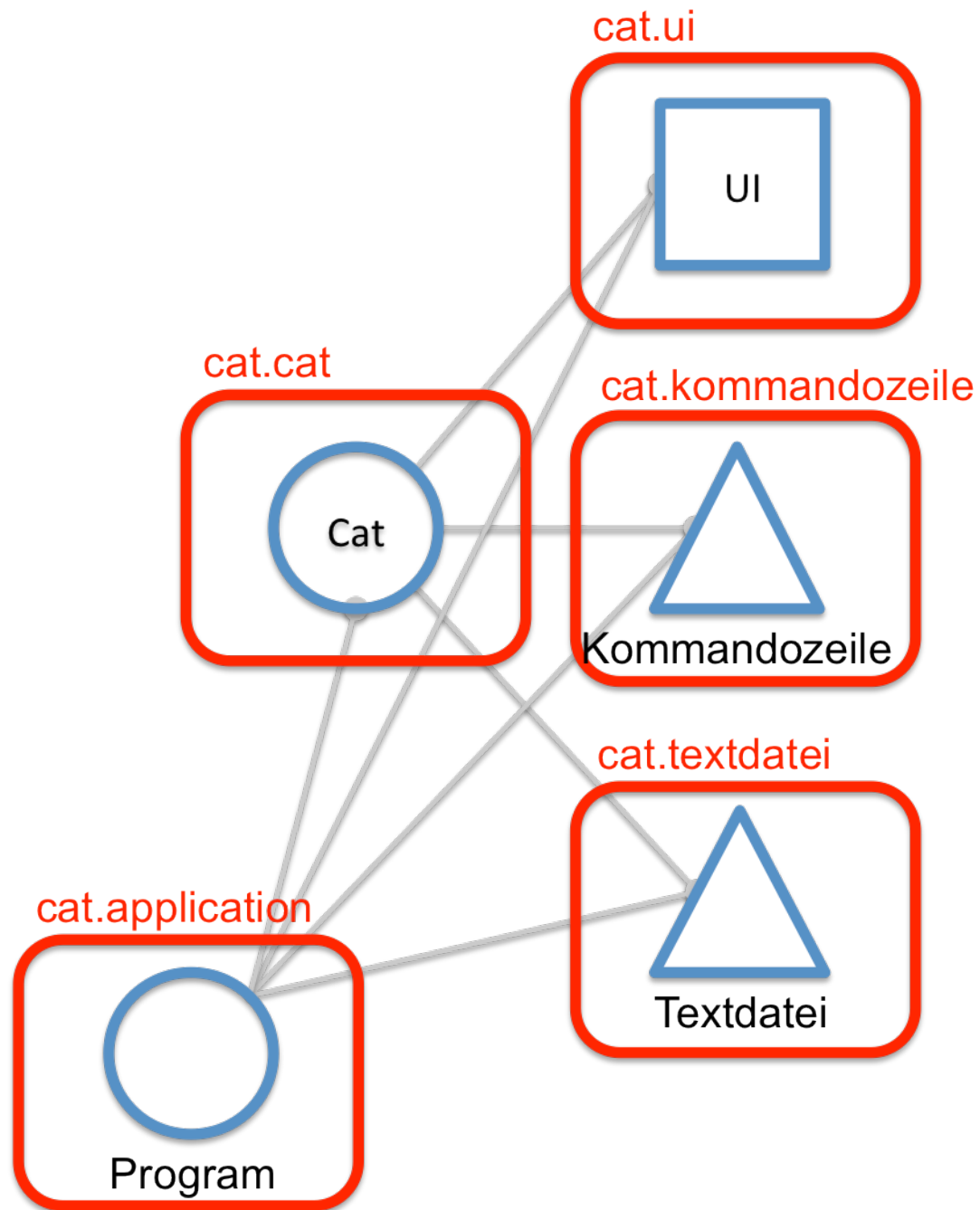
```
C:\Windows\system32\cmd.exe

C:\bin>cat.application datei1.txt datei2.txt
Dies ist der Inhalt
von Datei 1.
Sie besteht aus drei Zeilen.
Datei 2 hat nur eine Zeile.

C:\bin>
```





Schneiden von Komponenten



Ziel: Arbeitsorganisation



Aspekte trennen




```
namespace cat.contracts
{
    public interface ICat
    {
        void Run();
    }
}
```

```
using System.Collections.Generic;
```

```
namespace cat.contracts
```

```
{
```

```
    public interface IUi
```

```
    {
```

```
        void Ausgeben(IEnumerable<string> zeilen);
```

```
    }
```

```
}
```

```
using System.Collections.Generic;
```

```
namespace cat.contracts
```

```
{
```

```
    public interface IKommandozeile
```

```
    {
```

```
        IEnumerable<string> Dateinamen();
```

```
    }
```

```
}
```

```
using System.Collections.Generic;
```

```
namespace cat.contracts
```

```
{
```

```
    public interface ITextdatei
```

```
    {
```

```
        IEnumerable<string> Einlesen(string dateiname);
```

```
    }
```

```
}
```

```
public interface ICat
{
    void Run();
}
```

```
public interface IUi
{
    void Ausgeben(IEnumerable<string> zeilen);
}
```

```
public interface IKommandozeile
{
    IEnumerable<string> Dateinamen();
}
```

```
public interface ITextdatei
{
    IEnumerable<string> Einlesen(string dateiname);
}
```

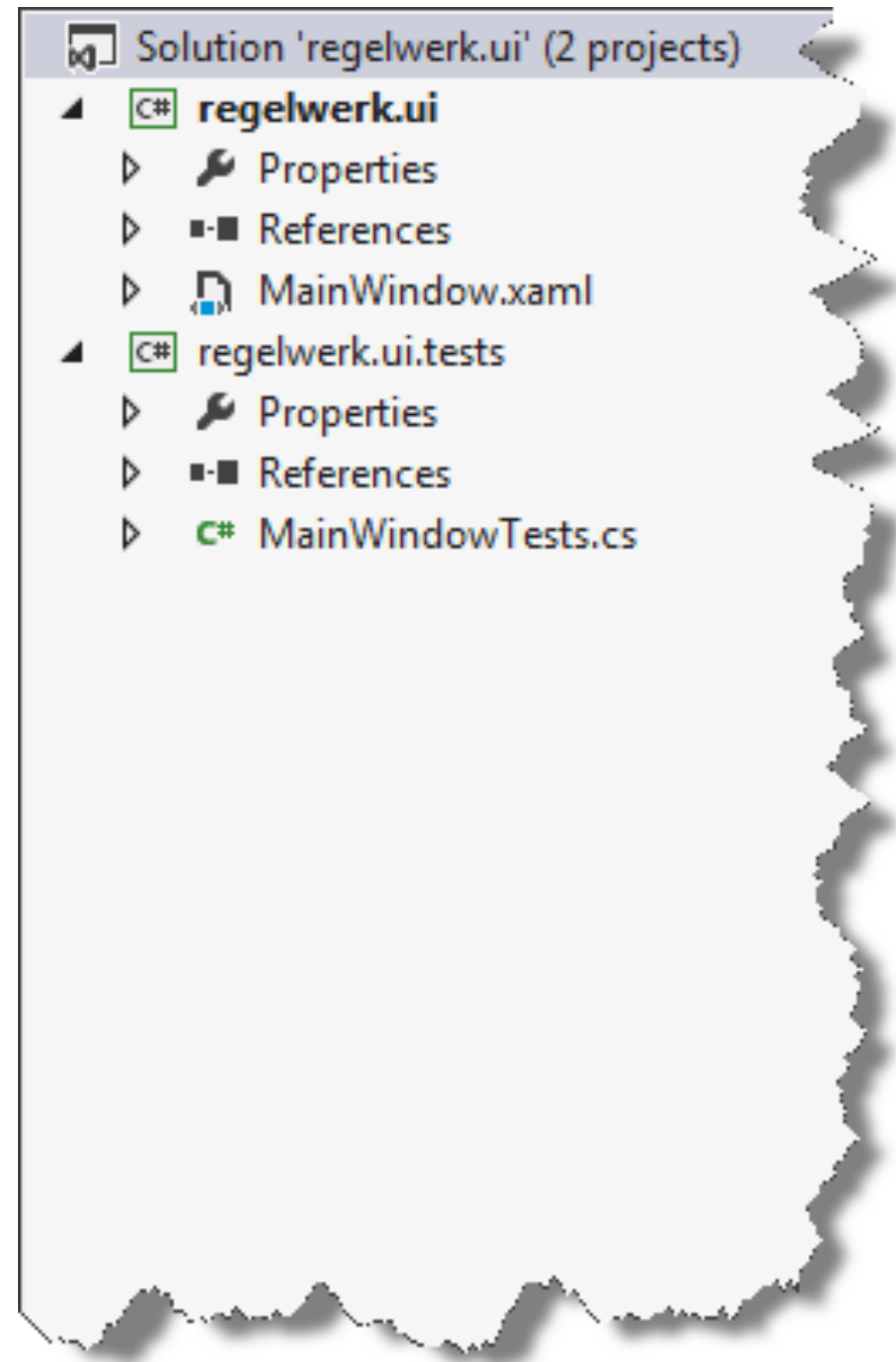
Demo

 Solution 'lernen' (5 projects)

- ▲  **lernen**
 - ▷  Properties
 - ▷  References
 - ▷  Program.cs
- ▲  **lernen.contracts**
 - ▷  Properties
 - ▷  References
 - ▷  Frage.cs
- ▲  **lernen.fragendatei**
 - ▷  Properties
 - ▷  References
 - ▷  FragenDatei.cs
- ▲  **lernen.logik**
 - ▷  Properties
 - ▷  References
 - ▷  Lernen.cs
- ▲  **lernen.ui.console**
 - ▷  Properties
 - ▷  References
 - ▷  Ui.cs

Eine Solution für **alles**.

Komponentenwerkbank



 Solution 'lernen' (5 projects)

- ▲  **lernen**
 - ▷  Properties
 - ▷  References
 - ▷  Program.cs
- ▲  **lernen.contracts**
 - ▷  Properties
 - ▷  References
 - ▷  Frage.cs
- ▲  **lernen.fragendatei**
 - ▷  Properties
 - ▷  References
 - ▷  FragenDatei.cs
- ▲  **lernen.logik**
 - ▷  Properties
 - ▷  References
 - ▷  Lernen.cs
- ▲  **lernen.ui.console**
 - ▷  Properties
 - ▷  References
 - ▷  Ui.cs

 Solution 'regelwerk.ui' (2 projects)

- ▲  **regelwerk.ui**
 - ▷  Properties
 - ▷  References
 - ▷  MainWindow.xaml
- ▲  **regelwerk.ui.tests**
 - ▷  Properties
 - ▷  References
 - ▷  MainWindowTests.cs

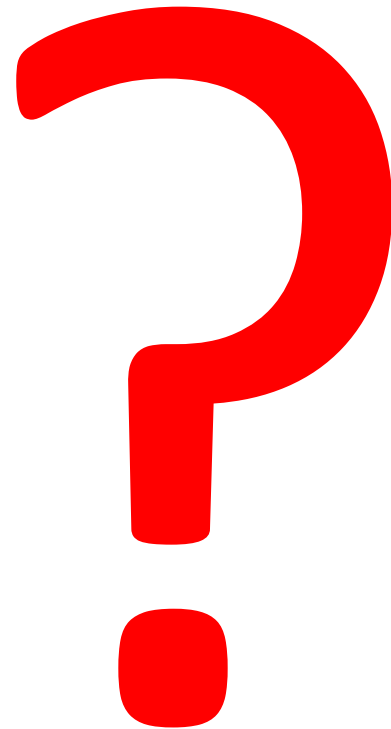
REFACTORING

IMPROVING THE DESIGN
OF EXISTING CODE

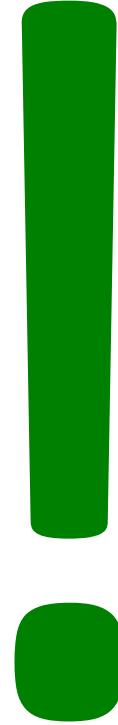
MARTIN FOWLER

With Contributions by **Kent Beck, John Brant,
William Opdyke, and Don Roberts**

Foreword by **Erich Gamma**
Object Technology International Inc.



Weniger
Abhängigkeiten



```

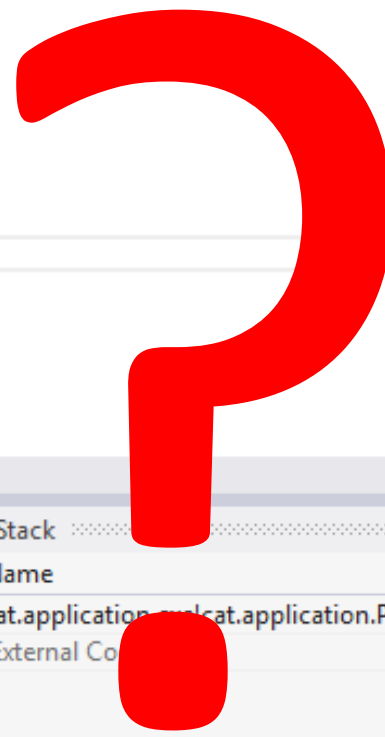
using cat.cat;
using cat.kommandozeile;
using cat.textdatei;
using cat.ui;

namespace cat.application
{
    internal class Program
    {
        private static void Main() {
            var ui = new Ui();
            var kommandozeile = new Kommandozeile();
            var textdatei = new Textdatei();

            var cat = new Cat(ui, textdatei, kommandozeile);

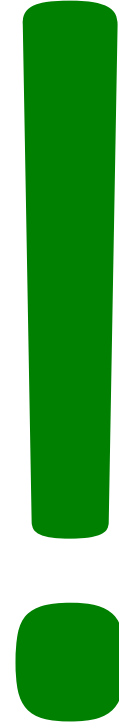
            cat.Run();
        }
    }
}

```



Locals			Call Stack	
Name	Value	Type	Name	
ui	{cat.ui.Ui}	cat.ui.Ui	cat.application.cat.application.Program.Main() Line 15	
kommandozeile	{cat.kommandozeile.Kommandozeile}	cat.kommandozeile.K	[External Co	
textdatei	{cat.textdatei.Textdatei}	cat.textdatei.Textdatei		
cat	null	cat.cat.Cat		

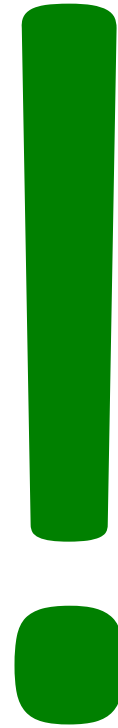
Automatisierte
Tests





Sooooooooo viele
Assemblies?

ILmerge



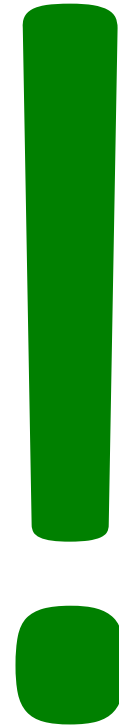
Output

Show output from: Build

```
1>----- Rebuild All started: Project: cat.application, Configuration: Debug Any CPU -----  
1> cat.application -> C:\Mercurial\stefanswiese\Buecher\Komponente\cat.application.exe  
===== Rebuild All: 1 succeeded, 0 failed, 0 skipped =====
```



Build-
Solution



Task Default -depends Test

```
Task Clean {  
    Remove-Item -Force -Recurse $output_dir -ErrorAction SilentlyContinue  
}
```

```
Task Build -depends Clean {  
    BuildSolutions($contracts_dir)  
    BuildSolutions($source_dir)  
    BuildSolutions($app_dir)  
}
```

```
Task Test -depends Build {  
    RunTests($contracts_dir)  
    RunTests($source_dir)  
    RunTests($app_dir)  
}
```

psake

```
properties {  
    $build_dir = resolve-path .  
    $base_dir = "$build_dir\.."  
    $source_dir = "$base_dir\source"  
    $contracts_dir = "$base_dir\source.contracts"  
    $app_dir = "$base_dir\source.application"  
    $output_dir = "$base_dir\bin"  
    $tools_dir = "$base_dir\tools"  
}
```

```
function BuildSolutions($path) {  
    $solutions = @(Get-ChildItem -Path $path -Filter *.sln -Recurse)  
    foreach($solution in $solutions) {  
        msbuild $solution.Fullname  
    }  
}
```

```
function RunTests($path) {  
    $test_assemblies = @(Get-ChildItem -Path $path -Filter *.Tests.dll -Recurse)  
    foreach($test_assembly in $test_assemblies) {  
        if($test_assembly.Fullname.Contains("obj\Debug")) {  
            continue  
        }  
        & $tools_dir\nunit-console.exe $test_assembly.Fullname  
    }  
}
```

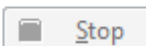
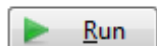


Run

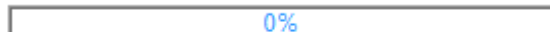
Build not running

Start time:

Run time:



Estimated Progress



Action Statistics

Total: 0

Successful: 0

Skipped: 0

Error: 0

Ignored: 0

Welcome x build.fbz7 x Process E-Junkie Sales.fbz7 x

Description

- Build contracts
 - Build VS.Net Solution [%FBPROJECTDIR%\..\source.contracts\cat.contracts\cat.contracts.sln]
- Build components
 - Folder Iterator [%FBPROJECTDIR%\..\source]
 - File/Fileset Iterator [%slnFolder%*.sln]
 - Build VS.Net Solution [%slnFilename%]
- Build host
 - Build VS.Net Solution [%FBPROJECTDIR%\..\source.application\cat.application\cat.application...

Ena



Projects Actions Run

Main OnFailure

Build Log

☐ Live Log View ☐ Show Full Log ☐ Show all Error Actions ☐ Show Ignored Errors ☐ Show In Context Search:

Message	Date	Start Time	End
build.fbz7	26.02.2013	12:19:45:445	12:19:45:445
Main	26.02.2013	12:19:45:446	12:19:45:446
Build contracts	26.02.2013	12:19:45:446	12:19:45:446
Build components	26.02.2013	12:19:46:851	12:19:46:851
Build host	26.02.2013	12:19:49:607	12:19:49:607

Fragen?

stefan@lieser-online.de