C♯ The Gilded Rose Recap

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Code Metrics (Visual Studio Enterprise)

Maintainability Index

Between 0 and 100. Higher is better. Aim for higher than 20

Cyclomatic Complexity

Lower is better. Split methods with complexity > 10

Lines of Source Code

Depth of Inheritance

Between 1 and infinity

Lower is better, but sometimes inheritance is good

Class Coupling

Lower is better. Aim for max 9

Lines of Executable Code

https://docs.microsoft.com/en-us/visualstudio/code-quality/code-metrics-values

Code Metrics - Original

	Maintainability Index	Cyclomatic Complexity	Depth of Inheritance	Class Coupling	Lines of Source Code	Lines of Executable Code
Program	50	22	1	4	131	34
Item	100	6	1	0	8	0
Total	**75**	**28**	**1**	**4**	**144**	**34**

Approach

Understand the task at hand – inspect the code

Write tests to ensure the program works to specification

Refactor, refactor, refactor

Extract methods

Implement *Conjured*

Refactor, refactor, refactor

1. Introduce polymorphism?
2. Immutable, functional, pattern matching?

The Gilded Rose in C♯

Demo

Code Metrics – Refactored – Make the Change Easy

	Maintain-ability Index	Cyclomatic Complexity	Depth of Inheritance	Class Coupling	Lines of Source Code	Lines of Executable Code
Program	58	3	1	5	52	9
Item	100	6	1	0	8	0
GildedRose	72	16	1	3	74	22
Total	**76**	**25**	**1**	**6**	**142**	**31**

Code Metrics – Refactored – Polymorphed

	Maintain-ability Index	Cyclomatic Complexity	Depth of Inheritance	Class Coupling	Lines of Source Code	Lines of Executable Code
Program	58	3	1	8	34	9
Item	91	8	1	1	21	5
AgedBrie	71	2	2	2	15	5
BackstageP.	63	4	2	2	23	9
Sulfuras	100	1	2	1	6	0
Conjured	71	2	2	2	15	5
Total	**75**	**20**	**2**	**9**	**132**	**33**

Code Metrics – Refactored – Immutable, Functional

	Maintain-ability Index	Cyclomatic Complexity	Depth of Inheritance	Class Coupling	Lines of Source Code	Lines of Executable Code
Program	68	3	1	8	33	10
GildedRose	69	12	1	6	81	30
Item	100	1	1	1	1	0
ItemType	100	1	1	0	1	0
Total	**84**	**17**	**1**	**10**	**125**	**40**

The Gilded Rose in F♯

Demo

Summary

	Maintainability Index	Cyclomatic Complexity	Depth of Inheritance	Class Coupling	Lines of Source Code	Lines of Executable Code
Original	75	28	1	4	144	34
Refactored	76	25	1	6	142	31
Polymorp.	75	20	2	9	132	33
Functional	84	17	1	10	125	40
F♯					**64**	

Conclusion - Discussion