Tutorial 5 - Baseline Estimates, Work Size, and Productivity Rate

CS 587 – Software Project Management
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Baseline Estimations

- Assume we have sample data from Assignment #1 and Assignment #2 as shown in the next slide.
- We will use this sample data to extrapolate values for Assignment #3 Work Size and Productivity Rate.

• Assignment #1 Values

Coding and unit test		
Write Code	5806 SLOC	5 SLOC/Hour
Unit Testing		
Prepare/Execute Test Cases	210 test cases	8 Test Cases/Day
Fix Found Defects	180 Defects	5 Defects/Day
Test Fixed Defects	180 Defects	31 Defects/Day
Code Inspection		
Preparation for Code Inspection		100 SLOC/Hour
Code Inspection Meeting		150 SLOC/Hour
Rework	304 defects	4 defects/Hour

• Assignment #2 Values

Coding and unit test		
Write Code	8250 SLOC	6 SLOC/Hour
Unit Testing		
Prepare/Execute Test Cases	415 test cases	1 Test Case/Hour
Fix Found Defects	344 Defects	5 Defects/Day
Test Fixed Defects	344 Defects	10 Defects/Day
Code Inspection		
Preparation for Code Inspection		120 SLOC/Hour
Code Inspection Meeting		150 SLOC/Hour
Rework	610 defects	5 defects/Hour

We use the values given from the two assignments (#1 and #2) to extrapolate values in assignment #3

Assignment #3

Task Name	Amount Of Work	Productivity Rate
Coding and Unit Test		
Write Code	4570 SLOC	
Unit Testing		
Prepare/Execute Test cases		
Fix Found Defects		
Test Fixed Defects		
Code Inspection		
Prepare for Code Inspection		
Code Inspection Meeting		
Rework		

Walk Through Example: Coding

Step 1: Identify Tasks

- Identify tasks **considering** the information provided by Assignment #1 and Assignment #2

Step 2: Extrapolate Productivity Rates

- Productivity Rates: For the task occurred in both Assignment #1 and #2, assume its productivity rate as the average of the same tasks' productivity rates from #1 and #2

Coding	
Write Code	4570 SLOC
Unit Testing	
Prepare/Execute Test Cases	
Fix Found Defects	
Test Fixed Defects	
Code Inspection	
Preparation for Code Inspection	
Code Inspection Meeting	
Rework	

Extrapolating Productivity rates

In Assignment #1:

Productivity rate for “Write Code” = 5 SLOC/Hour

In Assignment #2:

Productivity rate for “Write Code” = 6 SLOC/Hour

So, the productivity rate in **Assignment #3** will be the average of the first two values,

i.e $= \frac{5+6}{2} = \frac{11}{2} = 5.5 \approx 6$ SLOC/Hour

Walk Through Example: Coding

Step 3: Extrapolate Work Size

Example: Write code

- Given: Work size for Coding task = 4570 SLOC

  = **4.57 KLOC**

- Need to extrapolate work size for:
  - Prepare/Execute Test Cases
  - Fix Found Defects
  - Test Fixed Defects
  - Rework

Task Name	Amount Of Work
Coding and Unit Test	
Write Code	4570 SLOC
Unit Testing	
Prepare/Execute Test cases	
Fix Found Defects	
Test Fixed Defects	
Code Inspection	
Prepare for Code Inspection	
Code Inspection Meeting	
Rework	

- Example of questions to think for extrapolating:
  - What is the average no. of test cases per **KLOC** in both assignments?
  - What is the average no. of defects per **KLOC** in both assignments?

Prepare/Execute Test Cases

In Assignment #1:

Number of Test Cases/**K**LOC for "Prepare/Execute Test Cases"

$$= \frac{210}{5806} = 36.17 \approx 37 \text{ Test Cases/KLOC}$$

In Assignment #2:

Number of Test Cases/**K**LOC for "Prepare/Execute Test Cases"

$$= \frac{415}{8250} = 50.3 \approx 51 \text{ Test Cases/KLOC}$$

Average of Test Cases/KLOC from Assignment #1 & Assignment #2

$$= \frac{37+51}{2} = \frac{88}{2} = 44 \text{ Test Cases/KLOC}$$

In Assignment #3:

Number of Test Cases = 4.57 * 44 = 201.08 ≈ 202 Test Cases

Fix Found Defects

In Assignment #1:

Number of Defects/**K**LOC for “Fix Found Defects”

$$= \frac{180}{5806} = 31.002 \approx 32 \text{ Defects/KLOC}$$

In Assignment #2:

Number of Defects/**K**LOC for “Fix Found Defects”

$$= \frac{344}{8250} = 41.69 \approx 42 \text{ Defects/KLOC}$$

Average of Defects/KLOC from Assignment #1 & Assignment #2

$$= \frac{32+42}{2} = \frac{74}{2} = 37 \text{ Defects/KLOC}$$

In Assignment #3:

Number of defects= 4.57 * 37 = 169.09 ≈ 170 Defects

Test Fixed Defects

Same as Fix Found Defects.

Rework

In Assignment #1:

Number of Defects/**K**LOC for “Rework”

$$= \frac{304}{5806} = 52.36 \approx 53 \text{ Defects/KLOC}$$

In Assignment #2:

Number of Defects/**K**LOC for “Rework”

$$= \frac{610}{8250} = 73.94 \approx 74 \text{ Defects/KLOC}$$

Average Number of defects/KLOC for Assignment #1 & Assignment #2

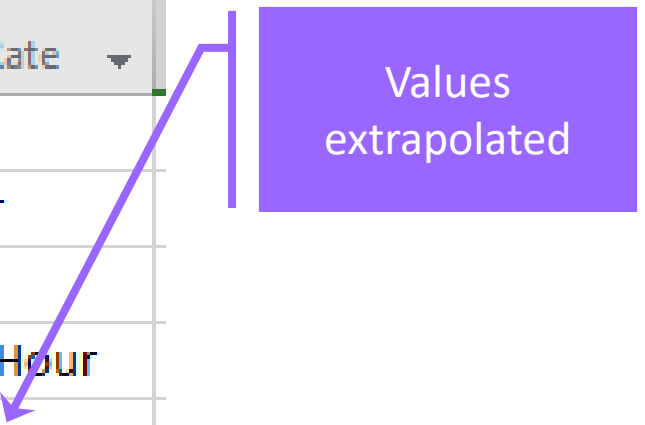
$$= \frac{53+74}{2} = \frac{127}{2} = 63.5 \approx 64 \text{ Defects/KLOC}$$

In Assignment #3:

Number of defects = 4.57 * 64 = 292.48 ≈ 293 Defects

Calculated Values for Assignment #3

Task Name	Amount Of Work	Productivity Rate
Coding and Unit Test		
Write Code	4570 SLOC	6 SLOC/Hour
Unit Testing		
Prepare/Execute Test cases	202 Test Cases	5 Test Case/Hour
Fix Found Defects	170 Defects	5 Defects/Day
Test Fixed Defects	170 Defects	21 Defects/Day
Code Inspection		
Prepare for Code Inspection	4570 SLOC	110 SLOC/Hour
Code Inspection Meeting	4570 SLOC	150 SLOC/Hour
Rework	293 Defects	5 Defects/Hour



Questions