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**

Task Name	Amount Of Work	Productivity Rate
Coding and Unit Test		
Write Code	5600 SLOC	5 SLOC/Hour
Unit Testing		
Prepare/Execute Test cases	334 Test Cases	10 Test Cases/Day
Fix Found Defects	410 Defects	5 Defects/Day
Test Fixed Defects	410 Defects	10 Defects/Day
Code Inspection		
Prepare for Code Inspection		148 SLOC/Hour
Code Inspection Meeting		190 SLOC/Hour
Rework	244 Defects	5 Defects/Hour

- **Assignment #2 Values**

Task Name	Amount Of Work	Productivity Rate
Coding and Unit Test		
Write Code	5730 SLOC	5 SLOC/Hour
Unit Testing		
Prepare/Execute Test cases	617 Test Cases	3 Test Case/Hour
Fix Found Defects	413 Defects	8 Defects/Day
Test Fixed Defects	413 Defects	16 Defects/Day
Code Inspection		
Prepare for Code Inspection		150 SLOC/Hour
Code Inspection Meeting		200 SLOC/Hour
Rework	814 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” = 5 SLOC/Hour

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

i.e $= \frac{5+5}{2} = \frac{10}{2} = 5$ 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"

$$= \frac{334*1000}{5600} = 59.64 \approx 60 \text{ Test Cases/KLOC}$$ [**Round up to next integer**]

In Assignment #2:

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

$$= \frac{617*1000}{5730} = 107.67 \approx 108 \text{ Test Cases/KLOC}$$

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

$$= \frac{60 + 108}{2} = \frac{168}{2} = 84 \text{ Test Cases/KLOC}$$

In Assignment #3:

Number of Test Cases = 4.57 * 84 = 383.88 ≈ 384 Test Cases

Fix Found Defects

In Assignment #1:

Number of Defects/**K**LOC for "Fix Found Defects"

$$= \frac{410*1000}{5600} = 73.21 \approx 74 \text{ Defects/KLOC}$$

In Assignment #2:

Number of Defects/**K**LOC for "Fix Found Defects"

$$= \frac{413*1000}{5730} = 72.07 \approx 73 \text{ Defects/KLOC}$$

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

$$= \frac{74+73}{2} = \frac{147}{2} = 73.5 \approx 74 \text{ Defects/KLOC}$$

In Assignment #3:

Number of defects= 4.57 * 74 = 338.18 ≈ 339 Defects

Test Fixed Defects

Same as Fix Found Defects.

Rework

In Assignment #1:

Number of Defects/**K**LOC for "Rework"

$$= \frac{244*1000}{5600} = 43.57 \approx 44 \text{ Defects/KLOC}$$

In Assignment #2:

Number of Defects/**K**LOC for "Rework"

$$= \frac{814*1000}{5730} = 142.05 \approx 143 \text{ Defects/KLOC}$$

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

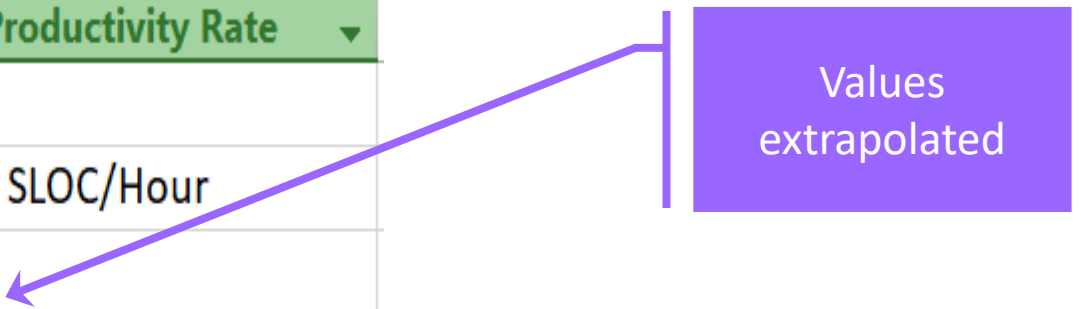
$$= \frac{44+143}{2} = \frac{187}{2} = 93.5 \approx 94 \text{ Defects/KLOC}$$

In Assignment #3:

Number of defects = 4.57 * 94 = 429.58 ≈ 430 Defects

Calculated Values for Assignment #3

Task Name	Amount Of Work	Productivity Rate
Coding and Unit Test		
Write Code	4570 SLOC	5 SLOC/Hour
Unit Testing		
Prepare/Execute Test cases	384 Test Cases	17 Test Case/Day
Fix Found Defects	339 Defects	7 Defects/Day
Test Fixed Defects	339 Defects	13 Defects/Day
Code Inspection		
Prepare for Code Inspection	4570 SLOC	149 SLOC/Hour
Code Inspection Meeting	4570 SLCO	195 SLOC/Hour
Rework	430 Defects	5 Defects/Hour



Questions