Software Engineering
Lecture 8
Intro to Estimation

Gregory S. DeLozier, Ph.D.
Kent State University
Feb 20, 2017

Estimation

- Why is it so hard?

- What are we trying to do?

- What are some methods of estimation

Definition

- Estimation (or estimating)
  - is the process of finding an estimate,
  - or approximation,
  - which is a value that is usable for some purpose
  - even if input data may be
    - incomplete,
    - uncertain, or
    - unstable.

Software Estimation

- Estimate
  - How long it will take
  - What resources will be required
  - When it can be delivered
  - What its characteristics will be

- Why?

Why Estimate?

- to know if something is feasible
- to know if something is feasible with our constraints
- to know if we have what we need to start
- to know how much we can deliver by a given date
- to know when to start if delivery is due on a date
- to estimate cost/benefit when prioritizing

Why is Estimating Hard?

- Uncertainty
- Unfamiliarity
- Newness

- Software is not alone in this.
  - Pipelines, bridges, rockets - often over budget.

- Software suffers more, though
  - If we had made an identical one before, we'd have it
  - Software is _always_ new.

Estimation Methods

- Judgement and experience
- Comparison
- Decomposition
- Parametric

Expertise

- Experience
- Heuristics
- Intuitive application of other rules

Comparison

- Find something a lot like this one

- How did that turn out?

- Gets better with experience

Decomposition

- Break into subtask components

- Estimate those
  (using some method)

- Add up the subtask estimates

Parametric

- Mathematically represent relationships
  - cost vs characteristics
  - e.g. sidewalk_cost = $20 * sq_ft

- These relationships can be derived from data

- Apply relationships to create an estimate

- See paper in reading for details

Informal Methods

- inchstones

- planning poker

Inchstones

- break down the thing to be estimated
  - dozens to hundreds of task parts

- guess the cost of parts
  - relative ordering is ok

- actually do some of the task parts

- use these to produce an estimate for the rest

- some people use high + low + 2 * average as a heuristic

Inchstone Exercise

- How long will it take you to multiply two 10-digit numbers together on paper?

- Don't actually do the computation.

- Present an answer supported by evidence.

Planning Poker

- A method for group estimation

1. Talk about the problem.
2. Everyone "plays a card" - makes an estimate
   (t-shirt sizes, for instance - XS,S,M,L,XL
3. Talk about with outliers
4. Repeat until estimates are consistent within two sizes

- There are variations
- Easy to use cards
- We're going to try an online version

Planning Poker Exercise

- Read these details:

  https://www.mountaingoatsoftware.com/agile/planning-poker

- Go here:

  https://www.planningpoker.com

Reading

- https://en.wikipedia.org/wiki/Estimation
- https://www.liquidplanner.com/blog/5-methods-of-project-estimation/
- https://www.mountaingoatsoftware.com/agile/planning-poker
- http://www.costandvalue.org/download/?id=1554 (Parametric Estimation)
- https://en.wikipedia.org/wiki/Planning_poker