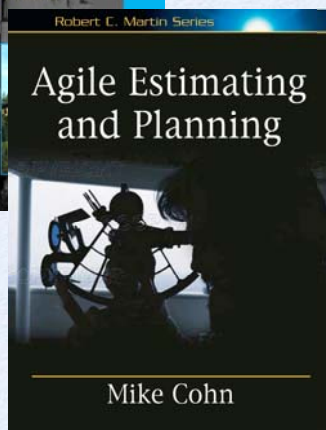


Agile Estimating and Planning



1

Mike Cohn - background



2

Today's agenda



- Overview
- Estimating in story points
- Estimating in ideal time
- Techniques for estimating
- Iteration planning
- Release planning
- Estimating velocity



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What's a good plan?

- A good plan is one that supports reliable decision-making
- Will go from
 - We'll be done in the fourth quarter
 - We'll be done in November
 - We'll be done November 7th



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What makes planning agile?

Is more focused on planning than the plan

Encourages change

Results in plans that are easily changed

Is spread throughout the project



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An agile approach to planning

Release

Conditions of Satisfaction
(user stories, budget, schedule)

Release planning

Feedback

Iteration

Conditions of Satisfaction
(user stories, tests)

Feedback

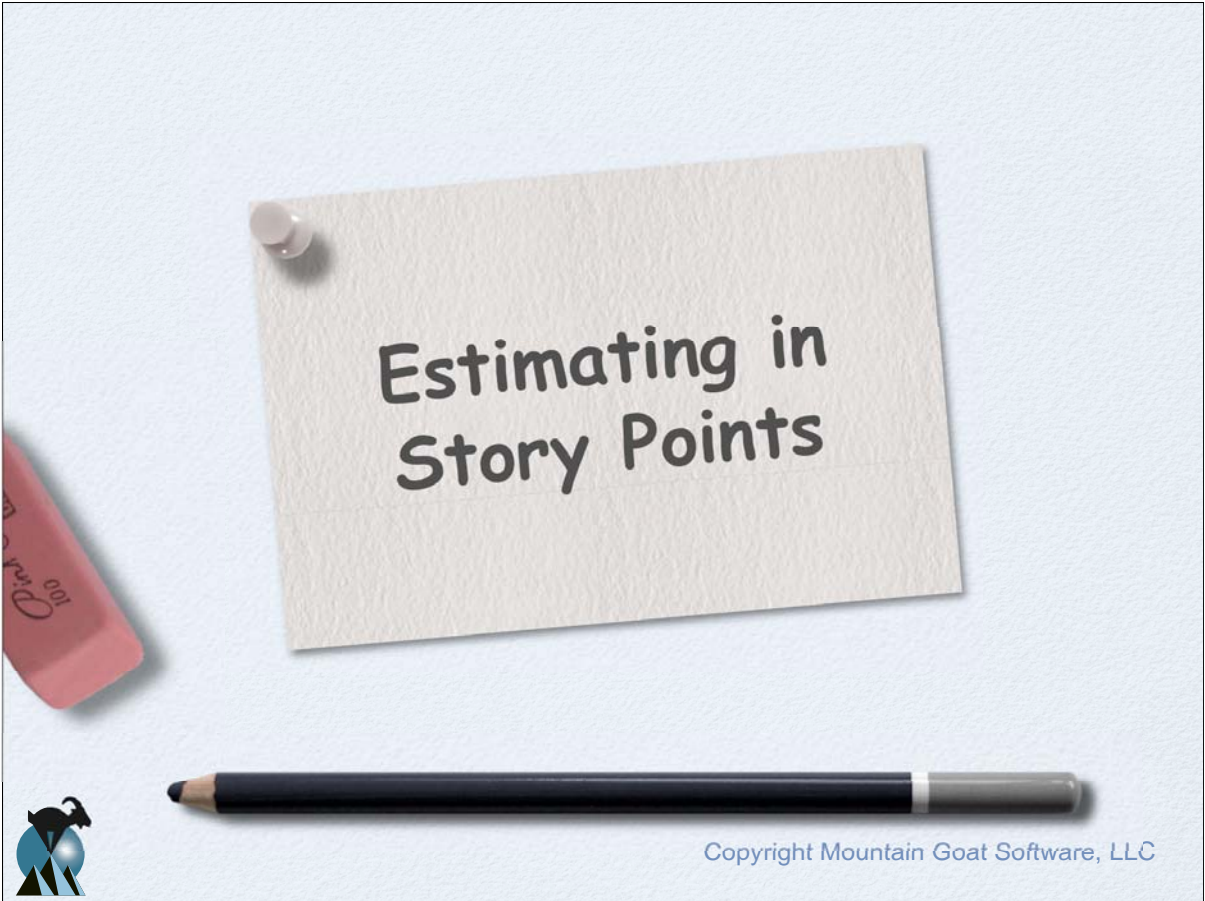
Iteration planning

Development

Product increment



6



Estimates on the product backlog

	Product Backlog		Iteration Backlog		
Iteration 1	As a frequent flyer, I want to...	3		Code the UI	8
	As a frequent flyer, I want to...	5		Write test fixture	6
Iteration 2	As a frequent flyer, I want to...	5		Code middle tier	12
	As a frequent flyer, I want to...	2		Write tests	5
	As a frequent flyer, I want to...	2		Automate tests	4

We're talking about these right now

How long will it take...



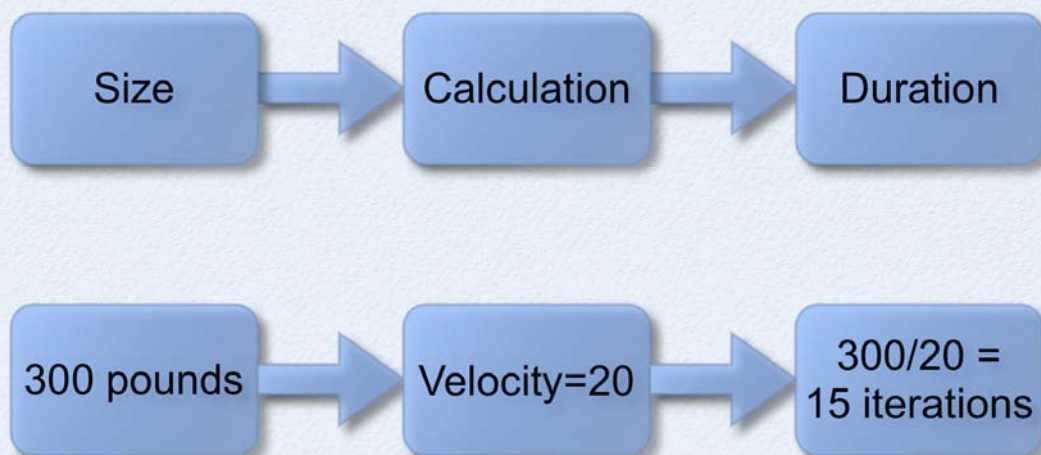
- ...to read the latest Harry Potter book?
- ...to drive to Seattle?



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Estimate size; derive duration

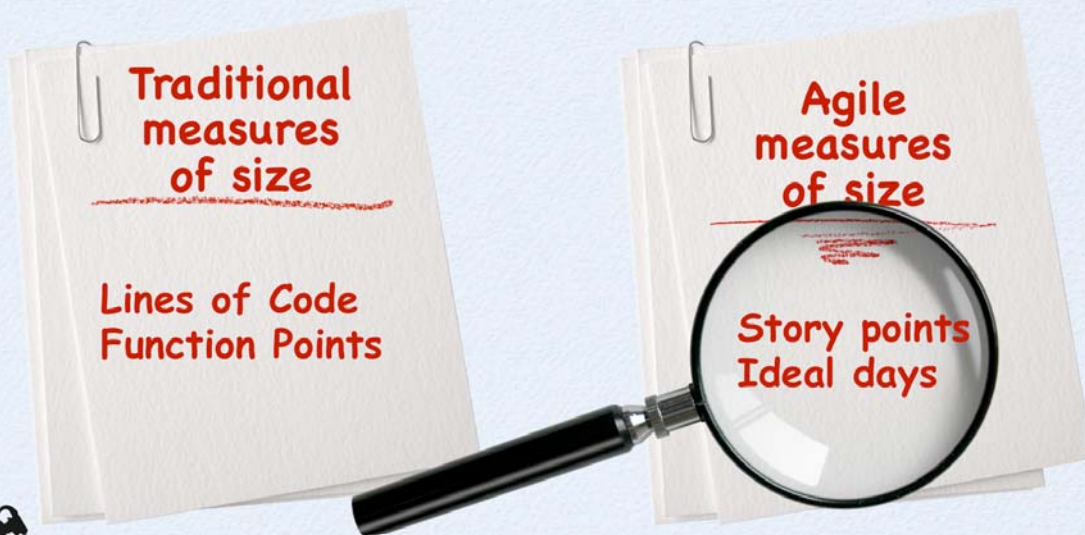


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Measures of size

- Traditional and agile measure size differently



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Story points

- The “bigness” of a task
- Influenced by
 - How hard it is
 - How much of it there is
- Relative values are what is important:
 - A login screen is a 2.
 - A search feature is an 8.
- Points are unit-less

As a user, I want to be able to have some but not all items in my cart gift wrapped.

5

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Dog points



Assign "dog points" to the following breeds

Labrador retriever
Dachshund
Great Dane
Terrier
German Shepherd
Poodle
St. Bernard
Bulldog

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Estimating in
Ideal Time

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Ideal time

- How long something would take if
 - it's all you worked on
 - you had no interruptions
 - and everything you need is available
- The ideal time of a basketball game is 40 minutes
 - Four 10-minute quarters
- The elapsed time is much longer (3+ hours?)



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Elapsed time vs. ideal time

Ideally

- Monday has 8 hours
- Each week has 40 hours

But instead

- Monday has:
- 3 hours of meetings
 - 1 hour of email
 - 4 hours left for the project

So, this developer will only make four hours of progress on Monday.

It will take two calendar days to complete one ideal day of work.

"How long will this take?"
 Are you answering what is being asked?

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Ideal time vs. elapsed time

- It's easier to estimate in ideal time
- It's too hard to estimate directly in elapsed time
 - Need to consider all the factors that affect elapsed time at the same time you're estimating



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Specialization

- First, don't worry about it too much
 - We're usually better off with fairly rapid, imprecise estimates than spending more time
- Second
 - Just add up the components and report one total estimate of ideal days



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The great debate



Story points or ideal days?



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Comparing the approaches

- Story points help drive cross-functional behavior
- Story point estimates do not decay
- Story points are a pure measure of size
- Estimating in story points is typically faster
- My ideal days cannot be added to your ideal days
- Ideal days are easier to explain outside the team
- Ideal days are easier to estimate at first
- Ideal days can force companies to confront time wasting activities



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What I usually do

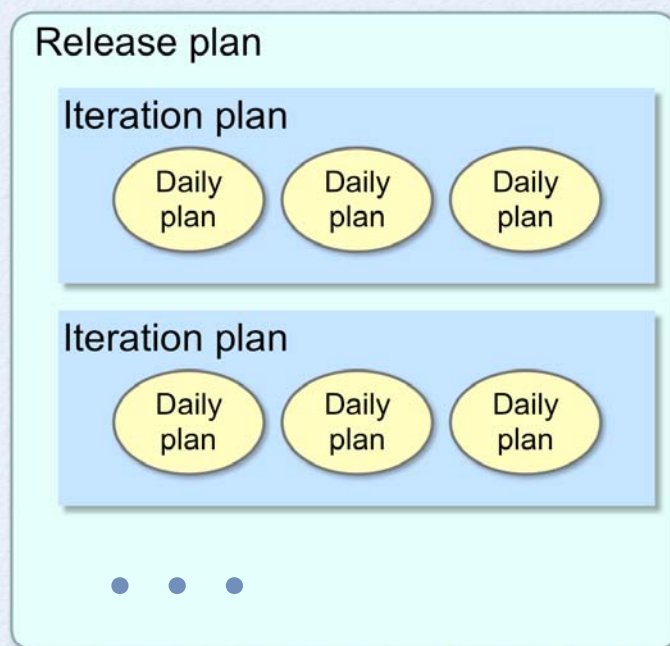
- I prefer story points
 - ...but they make some teams uncomfortable, so I'll
- Start with ideal time
 - Gives the team a nice foundation for the initial stories
 - Helps team get started
- Define "1 story point = 1 ideal day" then
 - Gradually convert team to thinking in unit-less story points
 - "This story is like that story."
 - Stop talking about how long it will take



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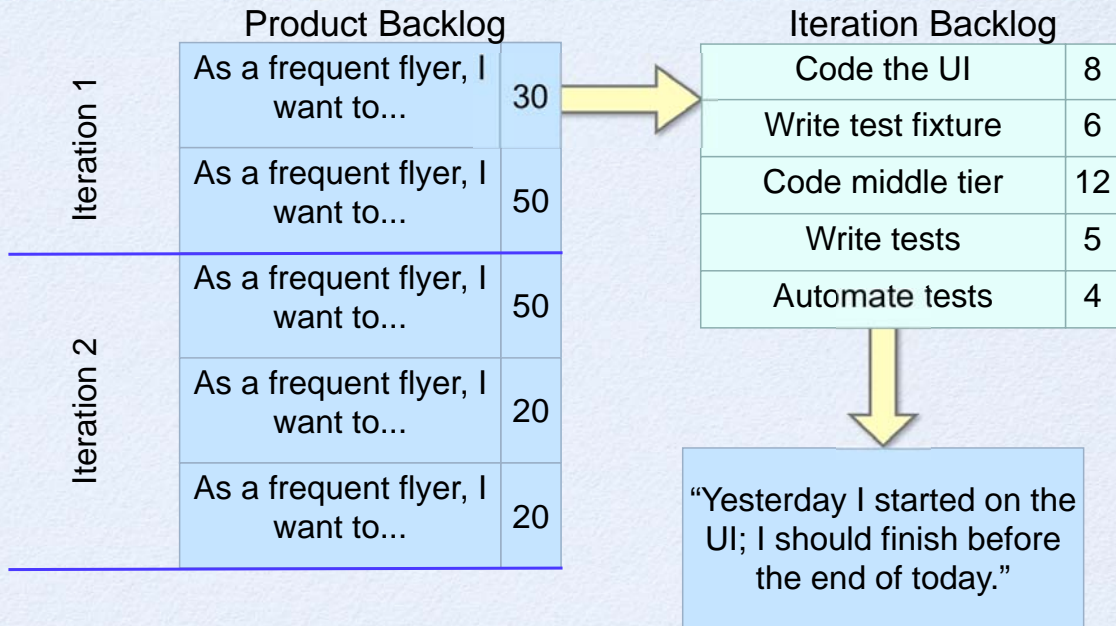
Three levels of planning...



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...three levels of precision



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Techniques for Estimating



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Approaches to estimating

- Analogy
- Disaggregation
- Planning poker



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Estimate by analogy

- Comparing a user story to others
 - “This story is like that story, so its estimate is what that story’s estimate was.”
- Don’t use a single gold standard
- Triangulate instead
 - Compare the story being estimated to multiple other stories

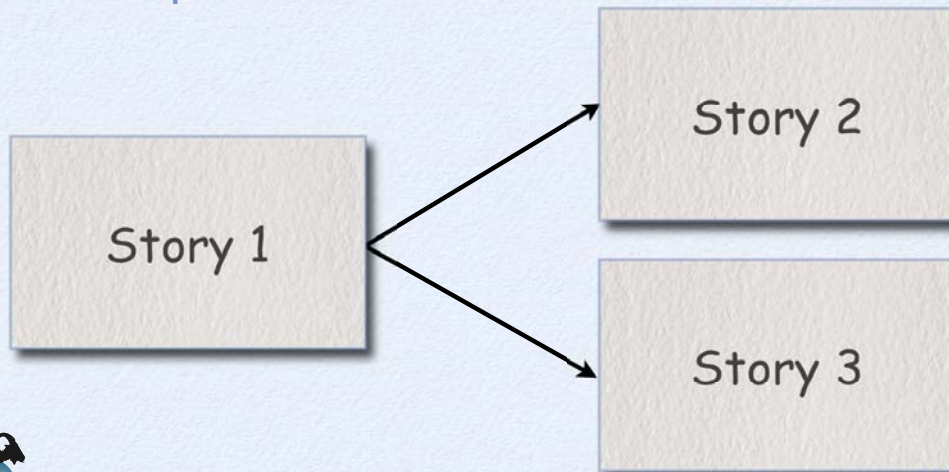


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Triangulation

- Confirm estimates by comparing the story to multiple other stories.
- Group like-sized stories on table or whiteboard



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Disaggregation

- Breaking a big story into smaller stories or tasks
- Sometimes very useful
- But disaggregating too far causes problems
 - Forgotten tasks
 - Summing lots of small errors can be big number

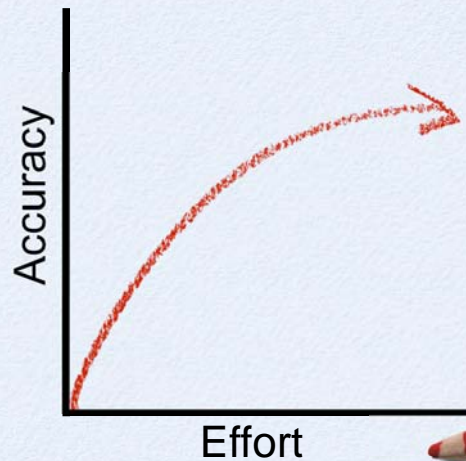


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How much effort?

- A little efforts helps a lot
- A lot of effort only helps a little more



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Use the right units

- Can you distinguish a 1-point story from a 2?
- Can you distinguish a 17 from an 18?
- Use units that make sense, such as
 - 1, 2, 3, 5, 8
 - 1, 2, 4, 8
- Stay mostly in a 1-10 range

Include 0
and $\frac{1}{2}$ if you
want



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Planning poker

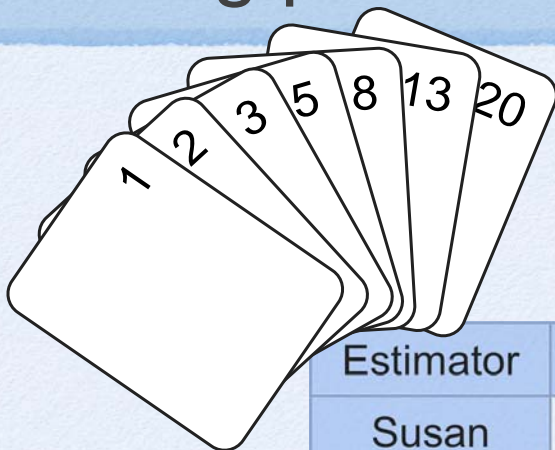
- An iterative approach to estimating
- Steps
 - Each estimator is given a deck of cards, each card has a valid estimate written on it
 - Customer/Product owner reads a story and it's discussed briefly
 - Each estimator selects a card that's his or her estimate
 - Cards are turned over so all can see them
 - Discuss differences (especially outliers)
 - Re-estimate until estimates converge



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Planning poker - an example



Estimator	Round 1	Round 2
Susan	3	5
Vadim	8	5
Ann	2	5
Chris	5	8



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Remodeling my kitchen



1. Install new hardwood floor
2. Refinish (remove, sand, repaint) the cabinets
3. Replace my tile countertop with granite
4. Repaint entire kitchen
5. Lay shelf paper
6. Install recessed lighting
7. Replace electric stove with gas stove
8. Install built-in refrigerator
9. Install a new oven
10. Plumb the island and add sink



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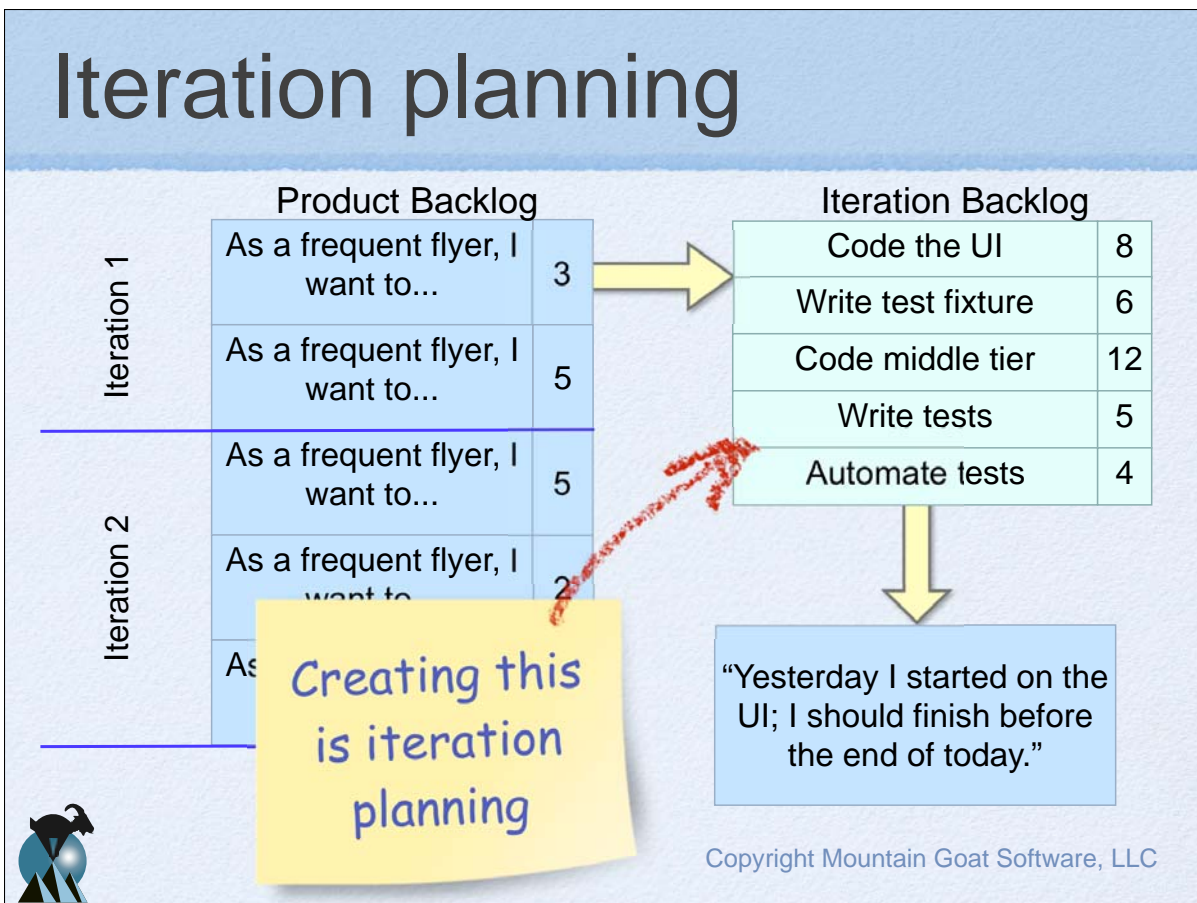
Why planning poker works

- Emphasizes relative estimating
- Focuses most estimates within an approximate one order of magnitude
- Everyone's opinion is heard
- Estimators are required to justify estimates
- It's quick
- It's fun



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Two approaches

- Velocity-driven iteration planning
 - “We finished 15 story points last time, let’s plan on 15 story points this time.”
- Commitment-driven iteration planning



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Commitment-driven iteration planning

- Discuss the highest priority item on the product backlog
- Decompose it into tasks
- Estimate each task
 - Whole team estimates each task
- Ask ourselves, “Can we commit to this?”
 - If yes, see if we can add another backlog item
 - If not, remove this item but see if we can add another smaller one



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Estimate availability

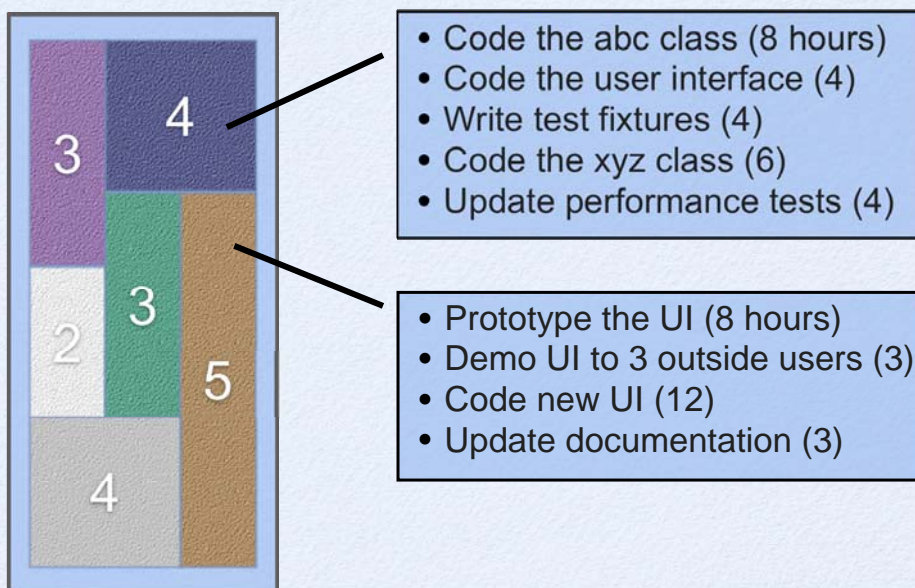
Person	Hours per Day	Hours per Iteration
Sergey	4-6	40-60
Yuri	5-7	50-70
Carina	2-3	20-30
Total		110-160



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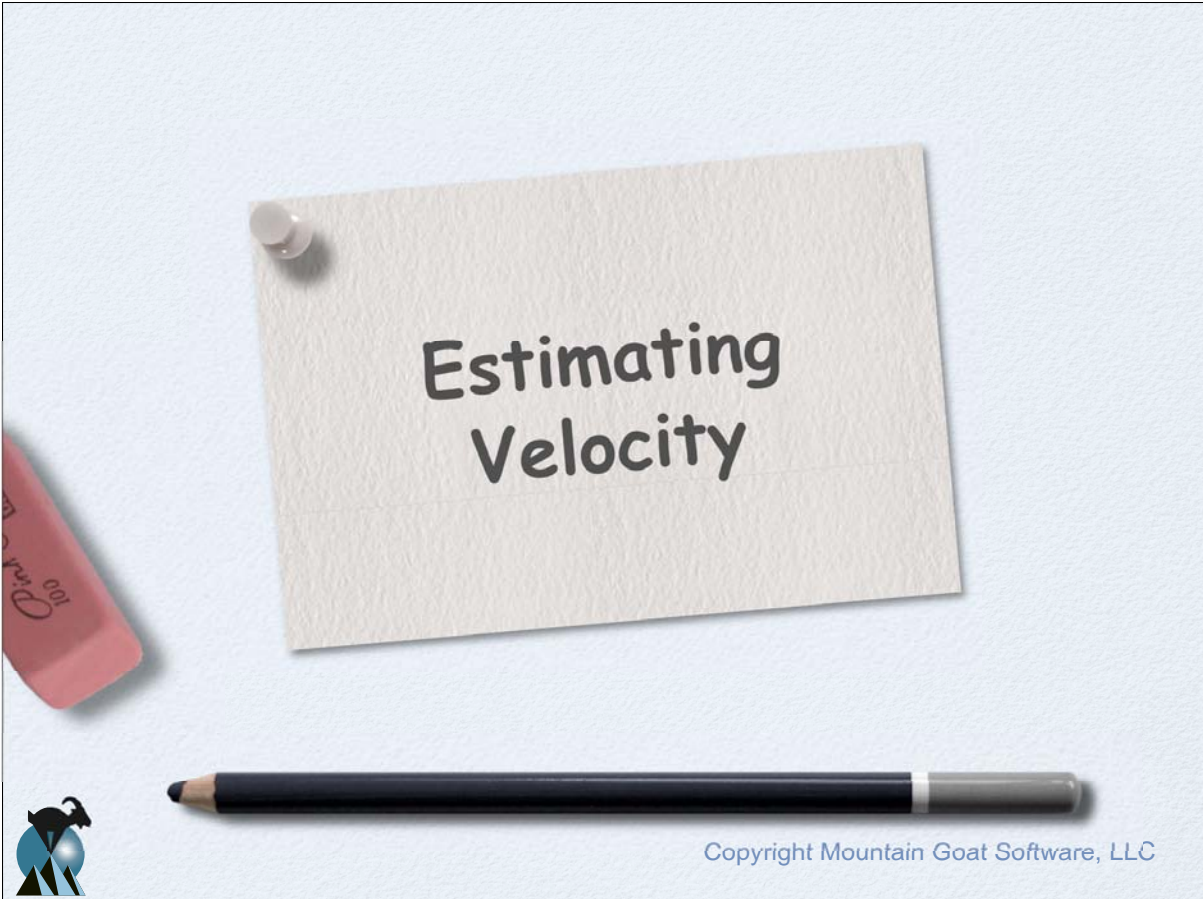
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It looks something like this



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Estimating Velocity

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Predicting velocity

- Three ways to come up with a velocity:

Use historicals

Run a few iterations

Forecast it

- Express velocity as a range that matches your uncertainty in it

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Forecasting velocity

- Just like commitment-driven iteration planning
 - Estimate available hours for the iteration
 - Repeat until full:
 - Pick a story, break into tasks, estimate each task

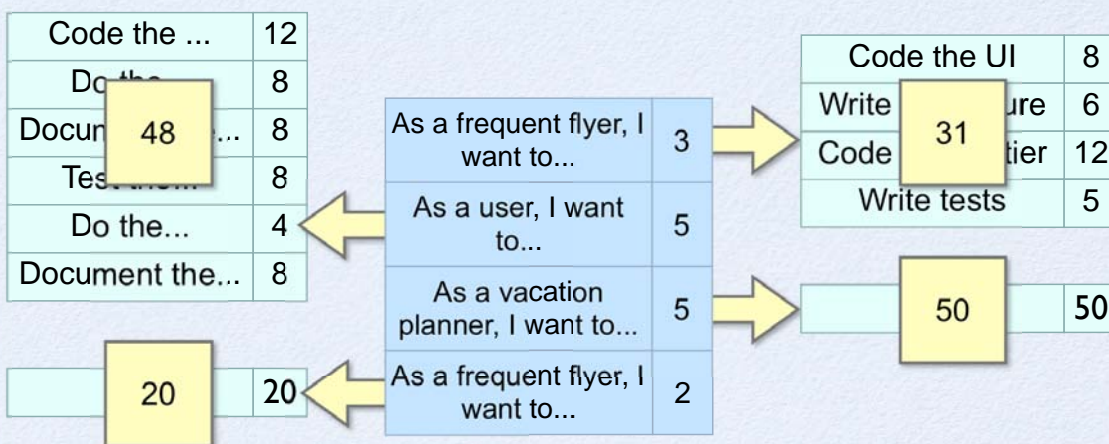
Ideally, "plan"
more than one
iteration



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An example



At 110-160 available hours per iteration,
what is the team's velocity?

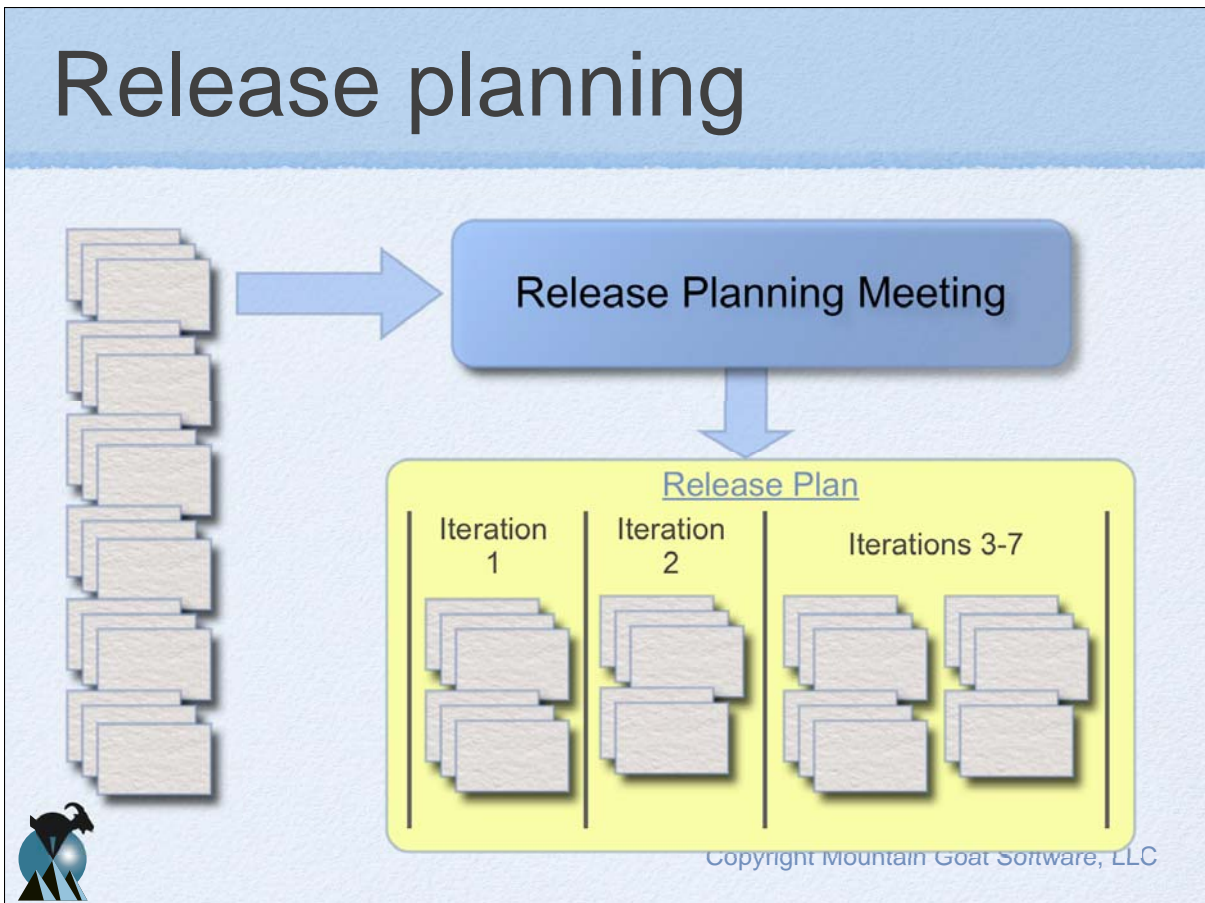


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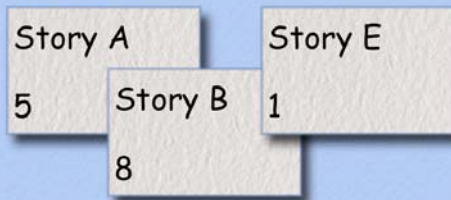
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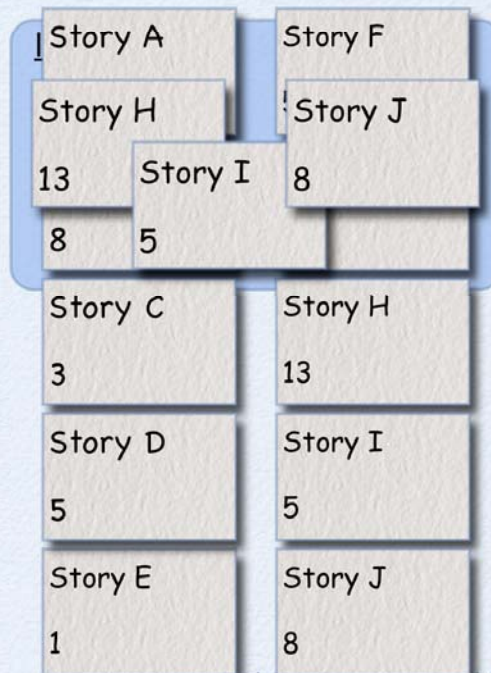
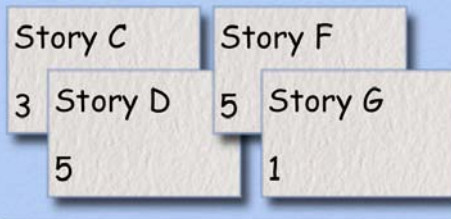
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An example with velocity=14

Iteration 1



Iteration 2



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Updating the release plan

- Revisit the release plan at the end of every sprint
- Update it based on:
 - Current understanding of velocity
 - Current prioritization of the product backlog
- This should be a very short and sweet process



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A simple updating example

Story A	5
Story B	3
Story C	5
Story F	3
Story D	5
Story E	5
Story G	3
Story I	3
Story H	5
Story J	2
Story K	5
Story L	3

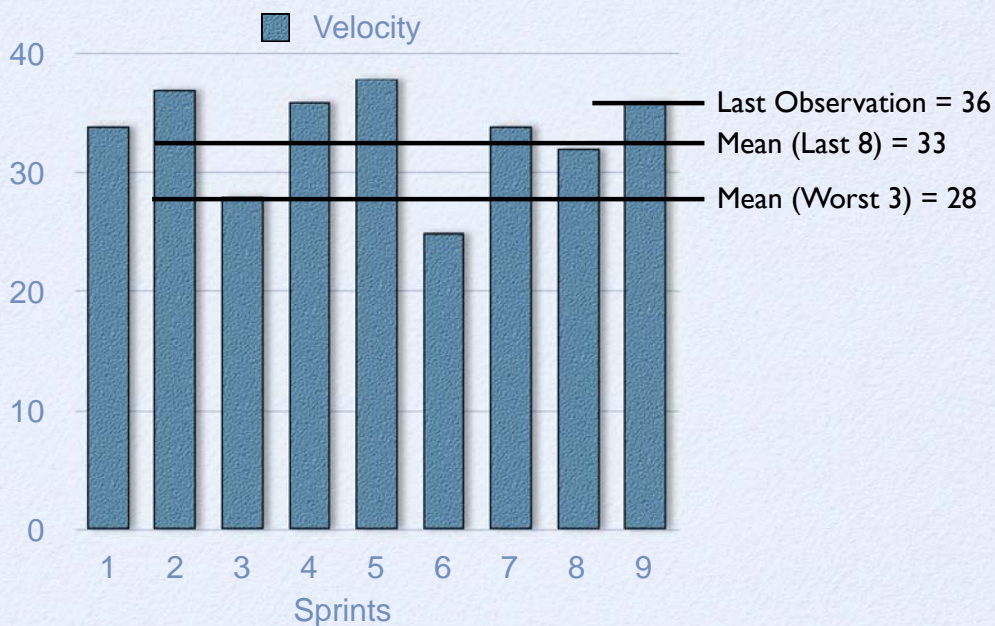
✓ Story A	5
✓ Story B	3
✓ Story C	5
Story F	3
Story D	5
Story E	5
Story G	3
Story I	3
Story H	5
Story J	2
Story K	5
Story L	3



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Look at velocity in a few ways



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Extrapolate from velocity



← At our slowest velocity we'll finish here

← At current velocity we'll finish here

← At our long-term average we'll finish here



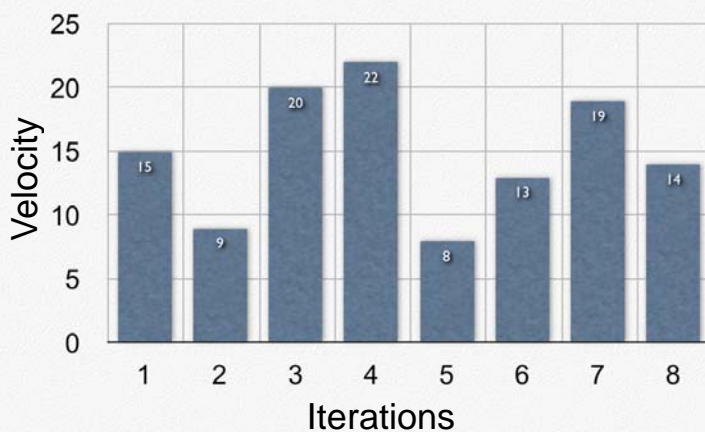
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Updating the release plan



Here are the results of the last 8 iterations. There are 6 iterations left. Using this data, update the release plan on the following slide left by drawing three arrows into it.



Mean of Worst 3 =
Most Recent =
Long-term Average = 14



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Update this release plan

Running Total	Estimate	Story
5	5	As a user, I can...
10	5	As a user, I can...
23	13	As a user, I can...
31	8	As a user, I can...
51	20	As a user, I can...
59	8	As a user, I can...
64	5	As a user, I can...
72	8	As a user, I can...
77	5	As a user, I can...
85	8	As a user, I can...
90	5	As a user, I can...
93	3	As a user, I can...



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Sample buffer calculation

Story	50%	90%	(90%-50%) ²
Story A	2	5	9
Story B	2	5	9
Story C	1	5	16
Story D	1	3	4
Story E	5	8	9
Story F	5	13	64
Total	16	39	111

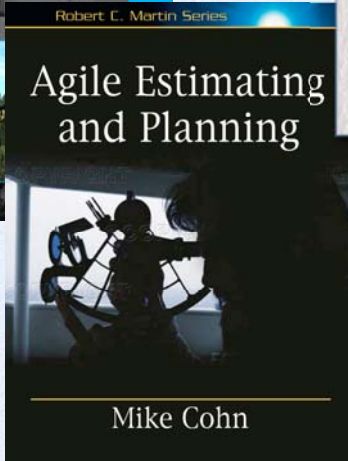
$$Schedule = 16 + \sqrt{111} = 16 + 11 = 27$$



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