

CPSC 3720

Lesson 9

Software Development Estimating and Planning Part 1

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School of
COMPUTING

TigerChow Project

– Sprint 0



Sprint 0 (total of 25 points):

- **Team Kickoff and TigerChow Epics/Services** using the Trello Board instructions.
- COPY the Kickoff and Epic boards to your workspace
- 2-3 minute review per team next Tuesday 2/13 to present:
 - Team Kickoff Board with team name and logo
 - Epic and Services board
- 10 points for thoughtful kickoff board/logo/name
- 10 points for thoughtful Epics and Services
- 5 points for the Sprint Review (if you are not present you lose the points)
- Team Survey due at end of day Wed 2/14 (if you don't do the survey, it will impact your grade!)

TigerChow Users/Roles Recommendation

As a < **type of user/user role** >, I want < some goal >, so that < some reason > (WHY)

Customers (role)

- On campus students
- Fraternities and sororities
- Off campus students
- Faculty
- Clemson locals
- Delivery drivers
- Restaurant managers and personnel
- Food critics
- Event planners
- People visiting the area
- Sports teams
- Loyalty program members
- Mobile users
- People who don't know technology
- Colorblind – visually impaired users
- Cash only customers
- 21 and up consumers

IGNORE

- Job applicants
- HR

Restaurant Staff (role)

- Fulfill orders

Delivery drivers (role)

- Delivery driver

TigerChow System Admin (role)

- IT users

Customer Service User (role)

- Customer Support staff to help customers with orders

Business User (role)

- Business users (run reports to manage business)
- Marketing
- HR
- TigerChow executive management
- Sales
- Partners/sponsors/advertisers (promotion on website)



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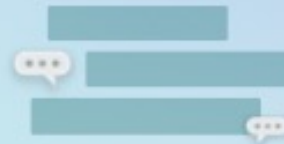
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0 response submitted

What is the opposite of a microservice based architecture?



Waiting for response...

Responses will be displayed in a list

Wondershare

All responses



1 of 1

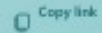




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Microservices should have low _____ and high _____



Waiting for response...

Responses will be displayed in a list

Wandcloud

All responses



1 of 1



❖ Definition

- The degree to which all elements of a component are directed towards a single task.
- The degree to which all elements directed towards a task are contained in a single component.
- The degree to which all responsibilities of a single class are related.

❖ **High Cohesion:** All elements of a component are directed toward and essential for performing the same task.

Consequences of Coupling

- High coupling
 - Components are difficult to understand in isolation
 - Changes in component ripple to others
 - Components are difficult to reuse
 - Need to include all coupled components
 - Difficult to understand
- Low coupling
 - May incur performance cost
 - Generally faster to build systems with low coupling



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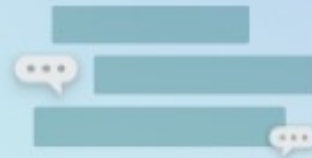
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Microservices communicate with each other using _____



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Responses will be displayed in a list

Wordcloud

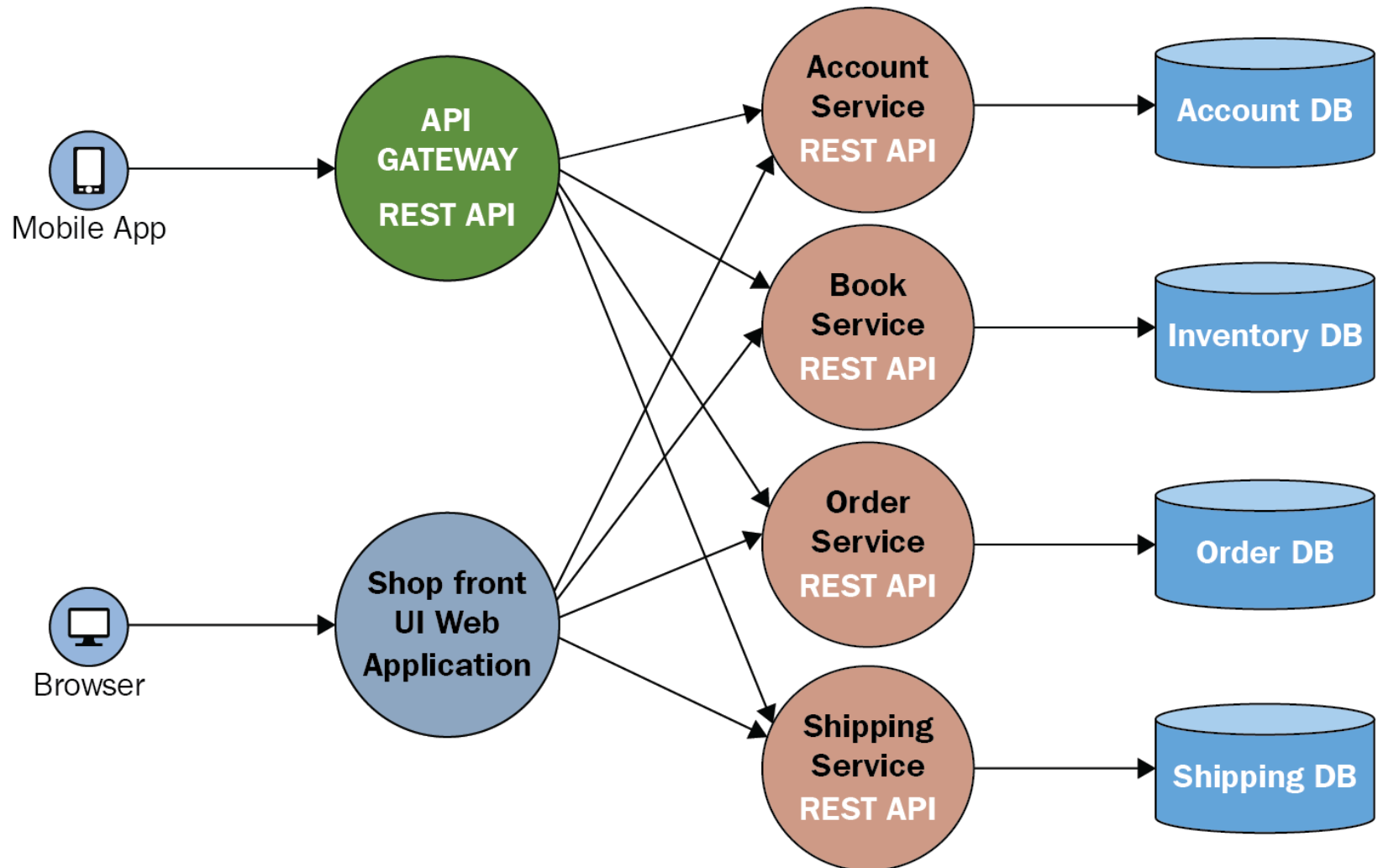
All responses



1 of 1



Microservices Example: Online Bookshop





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What are some of the benefits of microservices?



Waiting for response...

Responses will be displayed in a list

Word cloud

All responses



1 of 1



Why Microservices?

Top benefits of adopting microservices



Greater
agility



Continuous integration
and deployment



Improved
scalability



Faster time-to-market



Higher developer
productivity




Easier debugging
and maintenance



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What are some of the characteristics of microservices?



Waiting for response...

Responses will be displayed in a list

Wordcloud

All responses



1 of 1



Microservices Characteristics

Decentralized Data Management

Decentralized Governance



Design for Failure



Infrastructure Automation IT'S AN API!



Evolutionary Design

Planning Software Projects is EXTREMELY HARD

Why do we need to plan?

And why is it so hard to plan?

Planning Software Projects is EXTREMELY HARD

In The Mythical Man Month Fred Brooks gives five reasons this is so hard:

1. Our techniques of estimating are poorly developed. More seriously, they reflect an unvoiced assumption which is quite untrue, i.e., that all will go well
2. Our estimating techniques fallaciously **confuse effort with progress**, hiding the assumption that people and months are interchangeable

Planning Software Projects is EXTREMELY HARD

3. Because we are uncertain of our estimates,
software managers often lack the courteous stubbornness of Antoine's chef.
4. Schedule progress is poorly monitored.
Techniques proven and routine in other engineering disciplines are considered radical innovations in software engineering.
5. When schedule slippage is recognized, the natural (and traditional) response is to add manpower.
Like dousing a fire with gasoline, this makes matters worse, much worse.

Much of software development is sequential

“The bearing of a child takes nine months, no matter how many women are assigned.”

OR

“9 women in a month cannot make a baby”

Software development is a systems effort

“Since software construction is inherently a systems effort—an exercise in complex interrelationships—communication effort is great, and it quickly dominates the decrease in individual task time brought about by partitioning. Adding more [people] then lengthens, not shortens, the schedule.”

Fred Brooks Planning Rule of Thumb

1/3 planning

1/6 coding

1/4 component test and early system
test

1/4 system test, all components in hand

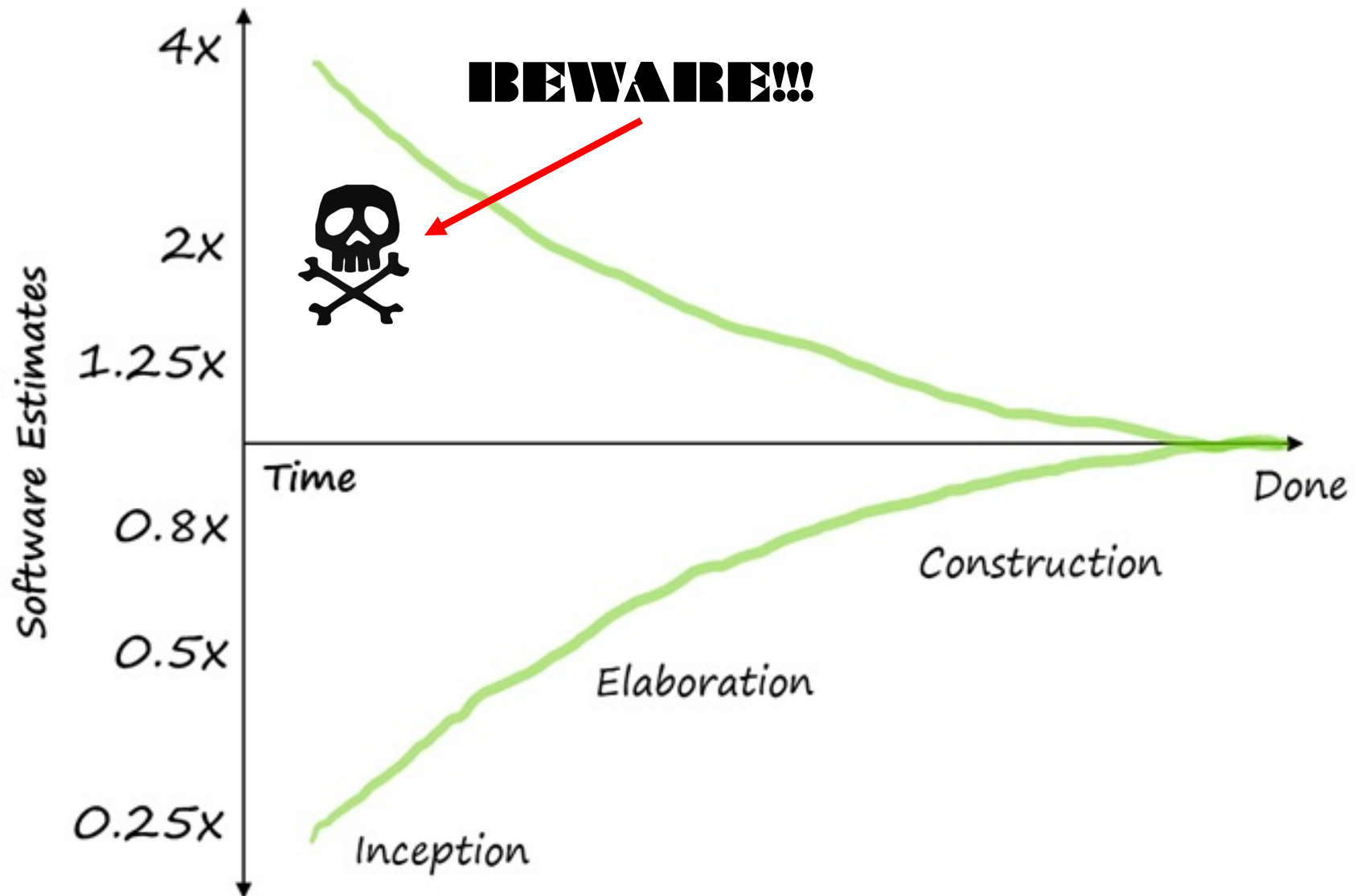
How does Agile help with planning?

The slide features a decorative header with a solid orange background. Below this, there are three wavy, overlapping lines in grey, purple, and grey, creating a modern, flowing design. The main body of the slide is white, and the footer is a solid dark purple bar.

How does Agile help with planning?

- Agile embraces the uncertainty in software development
- Agile focuses on creating plans that:
 - Are highly honest and visible
 - Focus on customer value in the shortest amount of time
 - Allow you to change course
 - Enable frequent progress reviews with each sprint

The Cone of Uncertainty



Plans need Estimates

- How?
 - Keep it Simple
 - Use Relative Sizing
- Once you have estimates:
 - Create a high-level plan and budget
 - Ongoing refinement (reminds us we were guessing)

SIMPLE – The estimate includes everything

Testing

Design

Coding

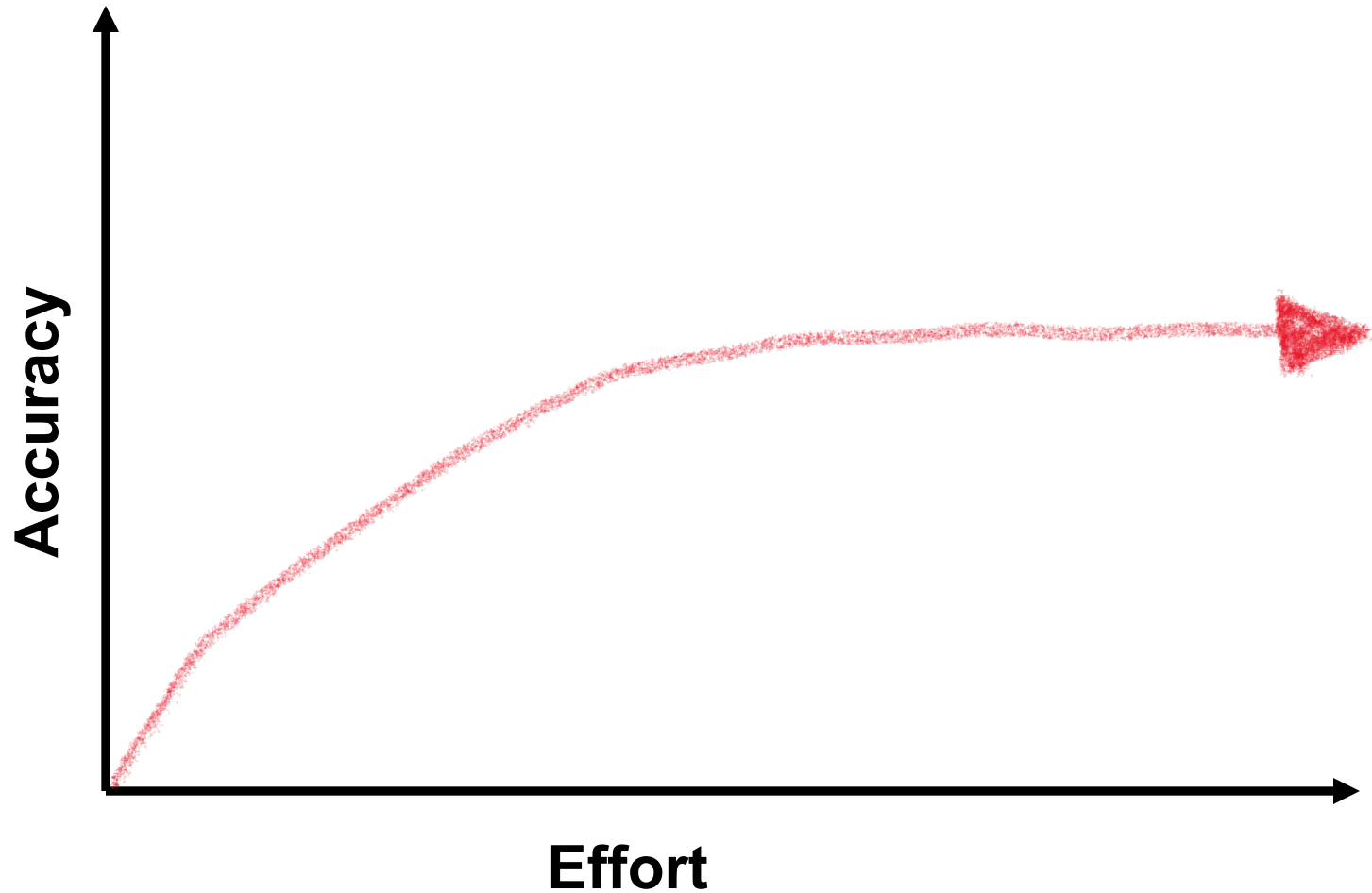
Documentation

UX



Story#1:
As an
customer, I
can login to
the CUSports
system.

**SIMPLE – Don't get stuck in
analysis paralysis!**



Use Relative Sizing



Small Story

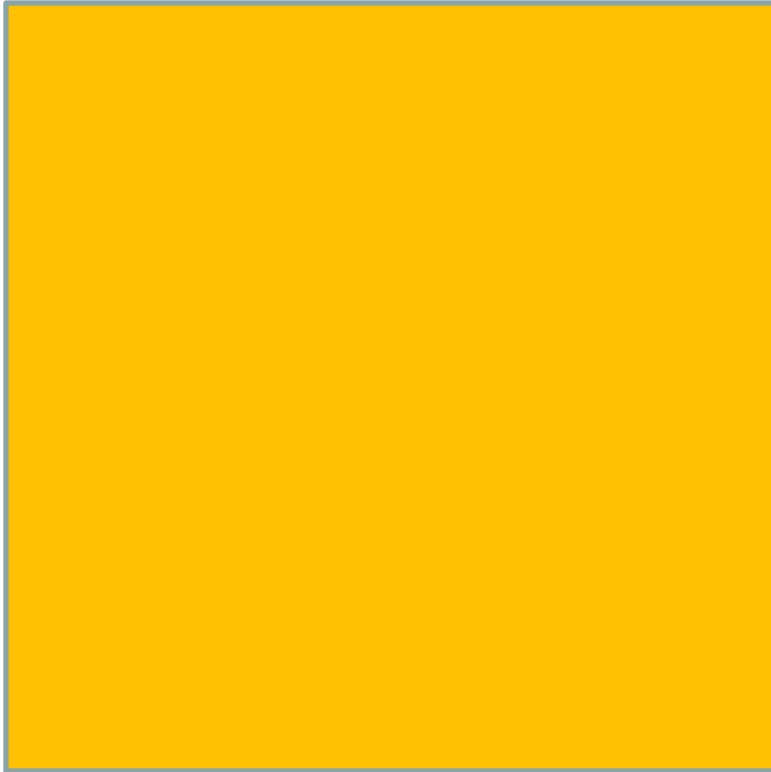


Medium Story



Large Story

Estimate absolutely

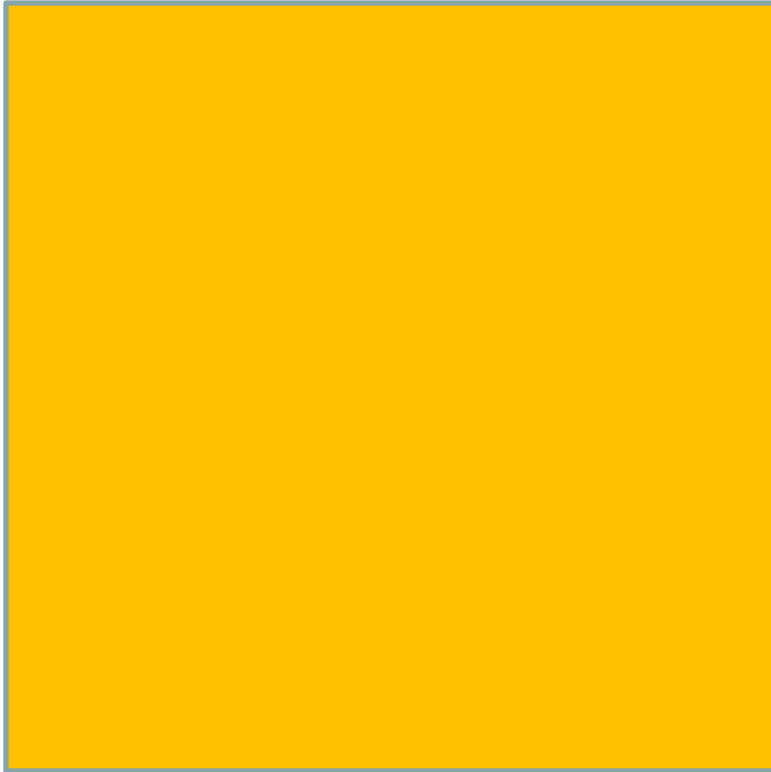


$X \text{ in}^2$



$Y \text{ in}^2$

Estimate relatively

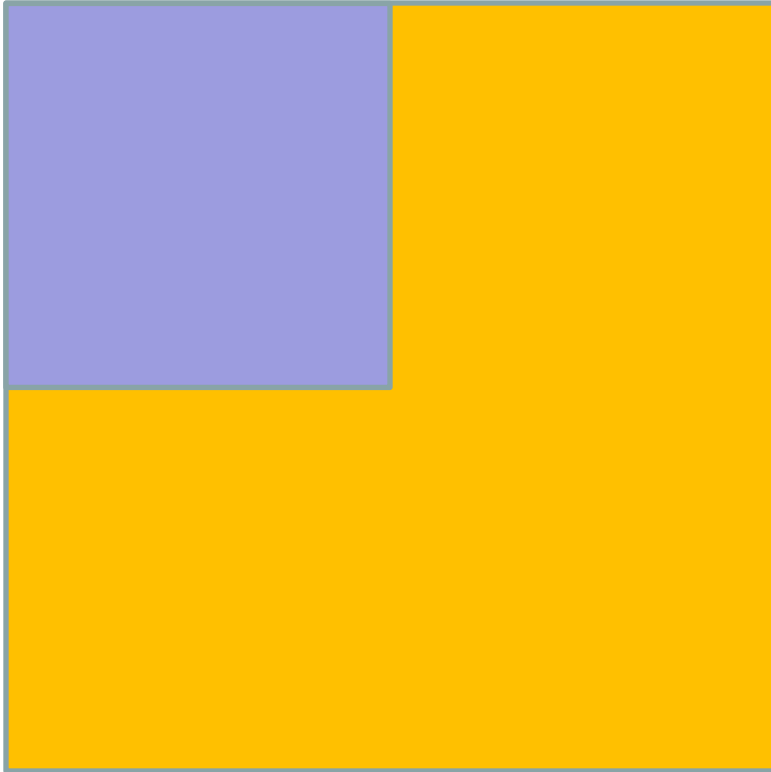


$X \text{ in}^2$



$Y \text{ in}^2$

Which is easier?



4x

Relative sizing is a cornerstone of Agile planning

Think about “bigness” of a story
and not “time”

Units of Measure Don't Matter!



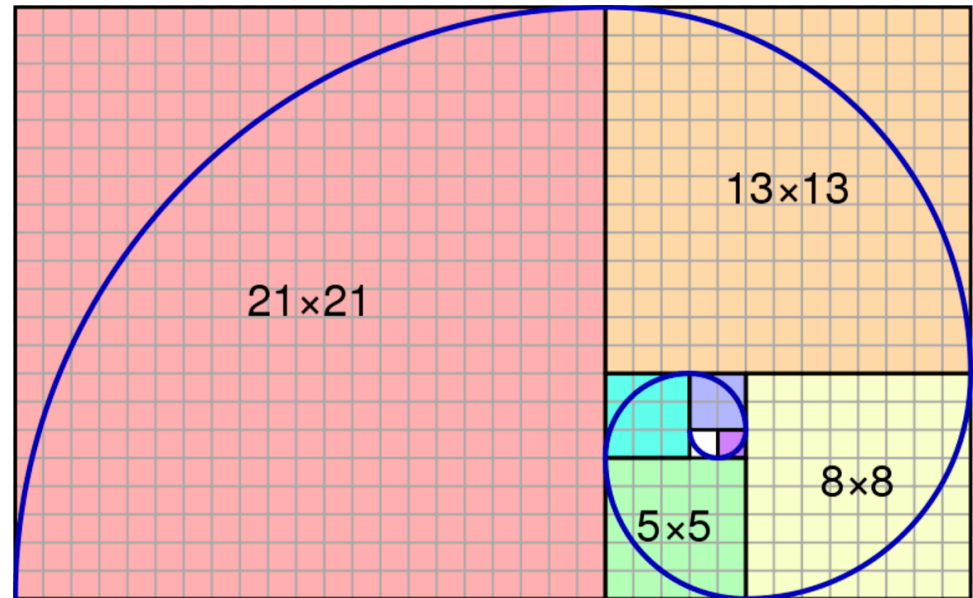
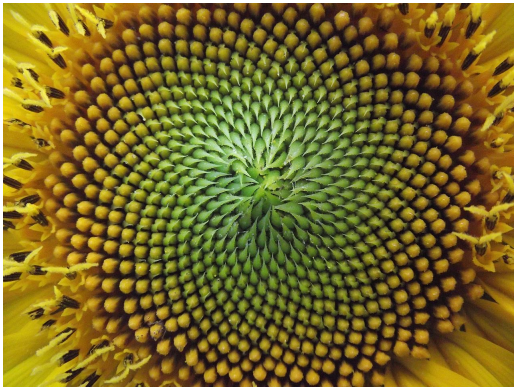
Medium Story



3 Story Points

Estimating Using Fibonacci Numbers

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657, 46368, 75025, 121393, 196418, 317811, ...



1. It's Composed Of Integers
2. It's Non-linear
3. It Forces You To Choose "More Or Less"
4. It Sounds Cool And Adds An Air Of Legitimacy

Science **ABC**

FIBONACCI **sequence**



Let's Practice!

Estimation using Fibonacci Numbers
– make a copy of below xls file

[Rapid Estimation Game](#)

Wednesday

Software Planning

And

We Play Poker!

Sources

www.mountaingoatsoftware.com

Great information, presentations,
and tutorials on Agile.