CPSC 3720
Lesson 13

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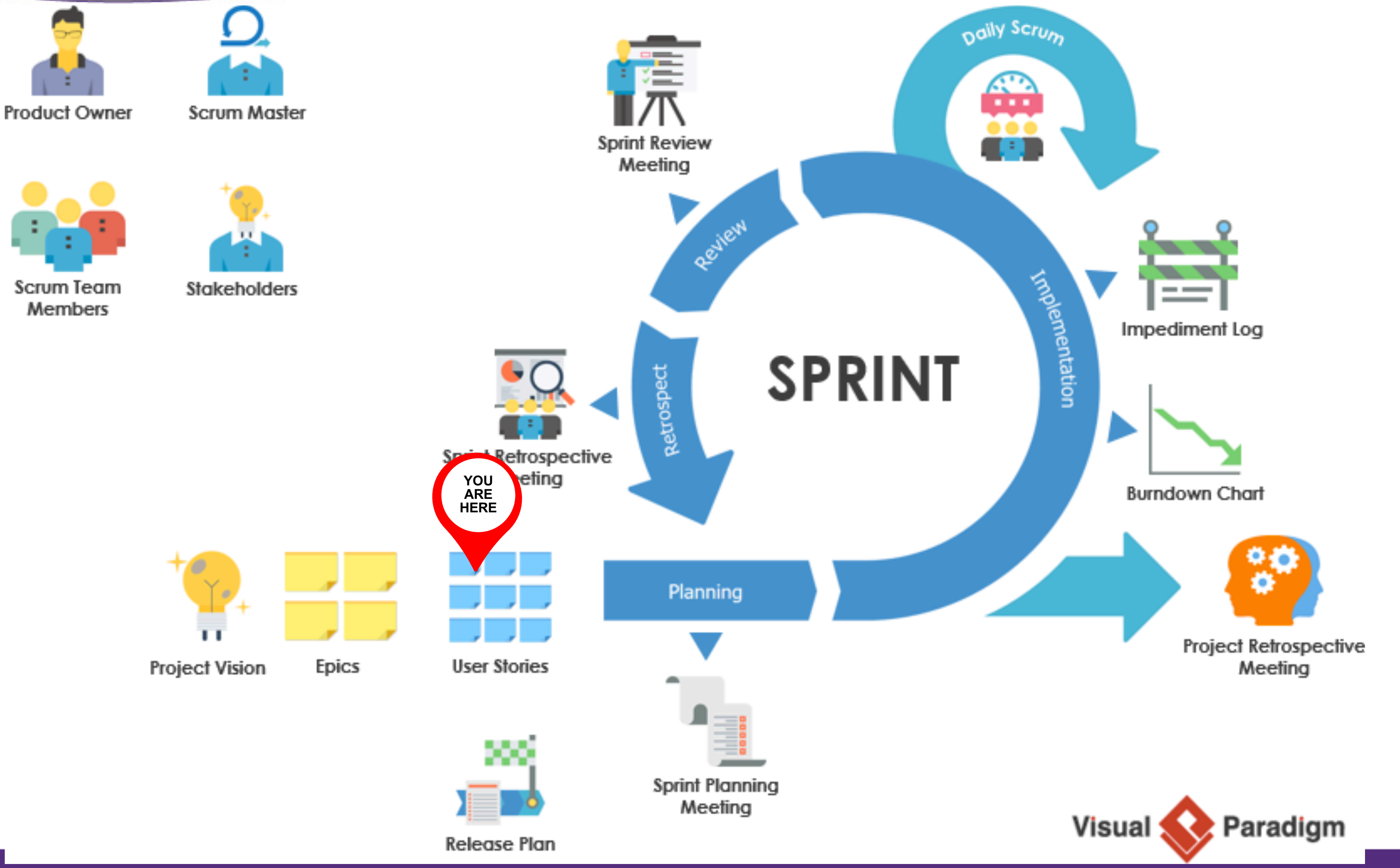
School of COMPUTING

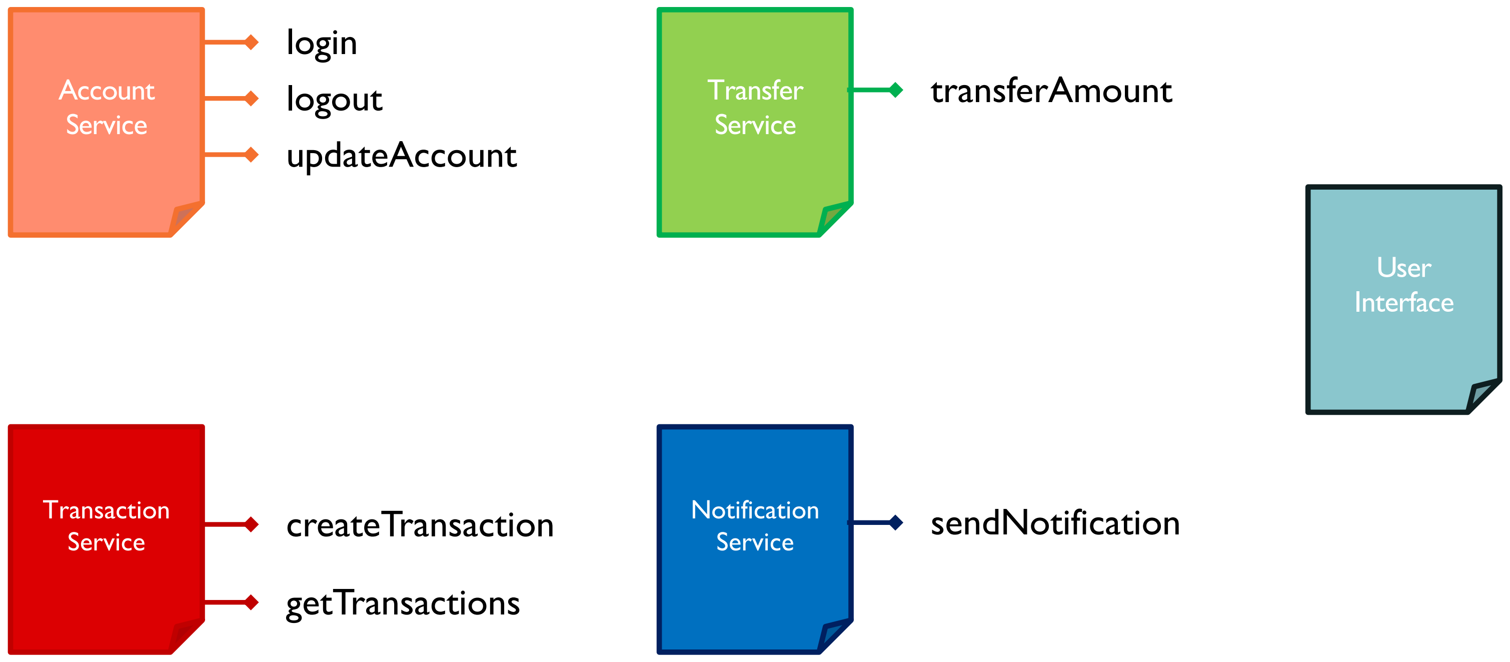
Scrum in 1 Picture



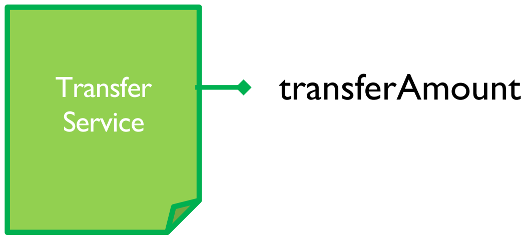
Modules

An online banking system……

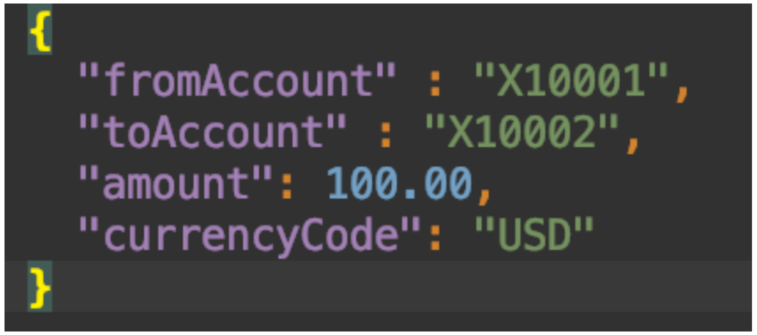
Clemson Bank



API Contract

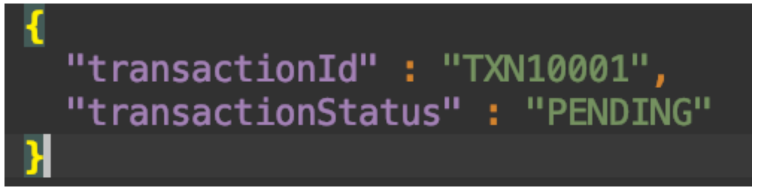


Input

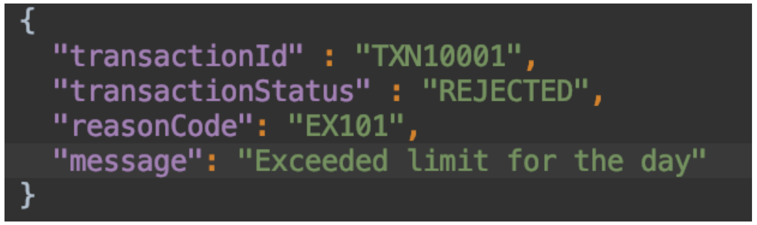


```
{
  "fromAccount" : "X10001",
  "toAccount" : "X10002",
  "amount": 100.00,
  "currencyCode": "USD"
}
```

Output



```
{
  "transactionId" : "TXN10001",
  "transactionStatus" : "PENDING"
}
```



```
{
  "transactionId" : "TXN10001",
  "transactionStatus" : "REJECTED",
  "reasonCode": "EX101",
  "message": "Exceeded limit for the day"
}
```

CUSports – Entities and API Contracts

CUSPORTS MODULES/COMPONENTS:

1. Account Service
2. Item Service
3. Search Service
4. Pricing Service
5. Cart Service
6. Payment Service
7. Notification Service

CUSPORTS BUSINESS FLOW:

- Create an account
- Login as existing user
- Search by items in stock
- View Product Details
- Add to Cart
- Enter shipping address
- Pay with Credit Card

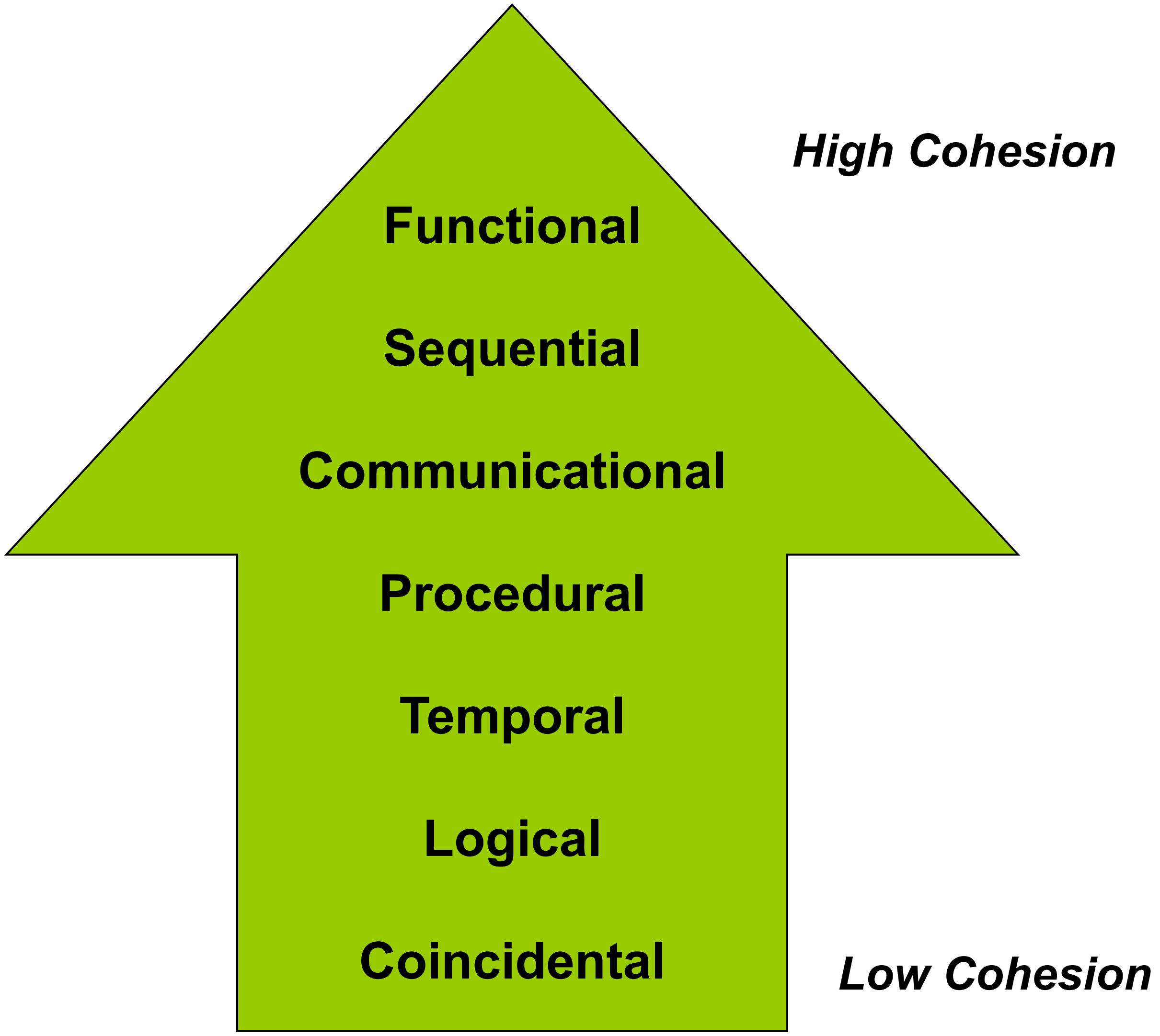
Keys to Good Design

- Component/Module/Service Independence
  - High Cohesion
  - Low Coupling
- Exception identification and handling
- Fault prevention and tolerance
- Design for change

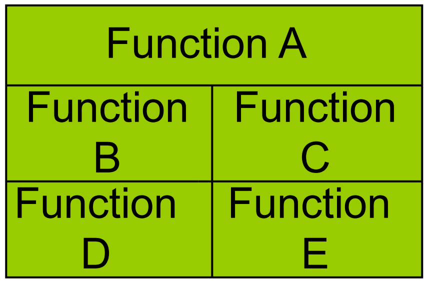
Cohesion

- 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.
- All elements of component are directed toward and essential for performing the same task.

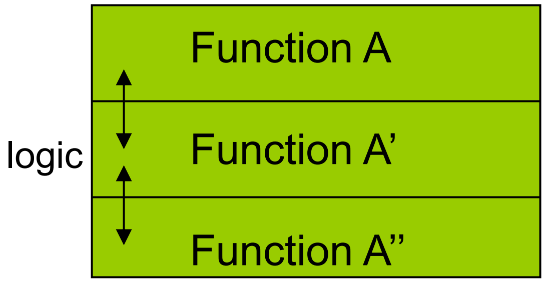
Cohesion


High Cohesion
Functional
Sequential
Communicational
Procedural
Temporal
Logical
Coincidental
Low Cohesion

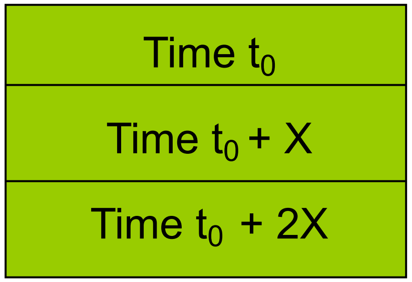
Cohesion Examples



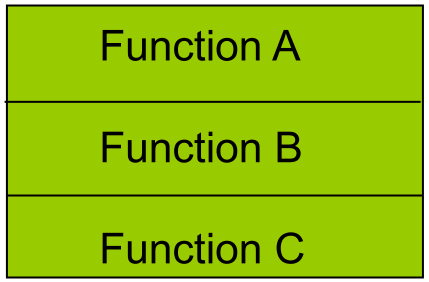
Coincidental
Parts unrelated



Logical
Similar functions

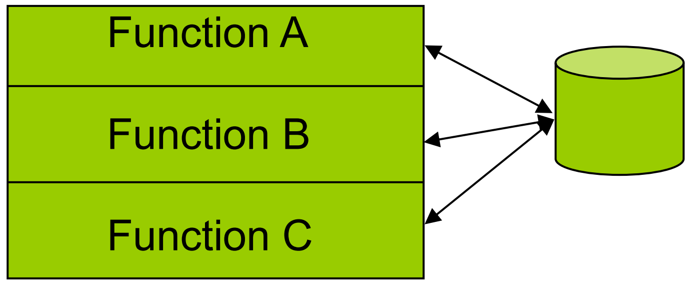


Temporal
Related by time



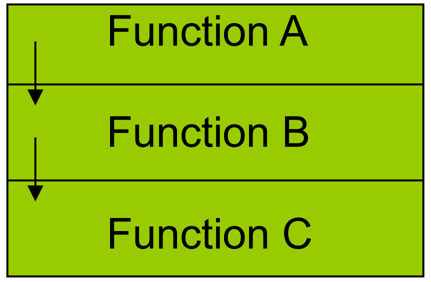
Procedural
Related by order
of functions

Cohesion Examples Cont'd



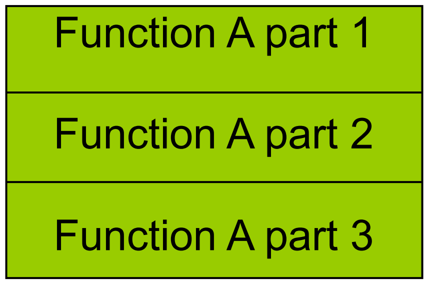
Communicational

Access same data



Sequential

Output of one is input to another

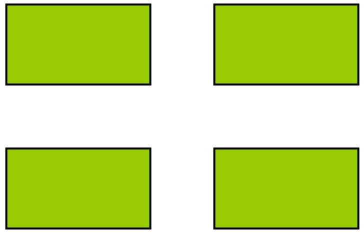


Functional

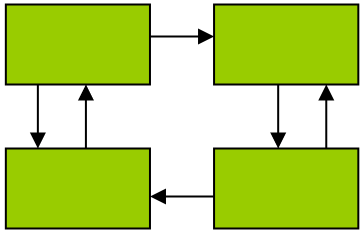
Sequential with complete, related functions

Coupling

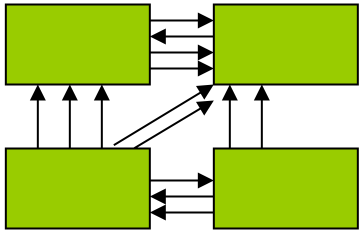
The degree of dependence across components such as the amount of interactions among components



No dependencies



Loosely coupled
some dependencies



Highly coupled
many dependencies

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

Discussion

What is the effect of cohesion and coupling on maintenance?

In Software Dev projects you often will hear:

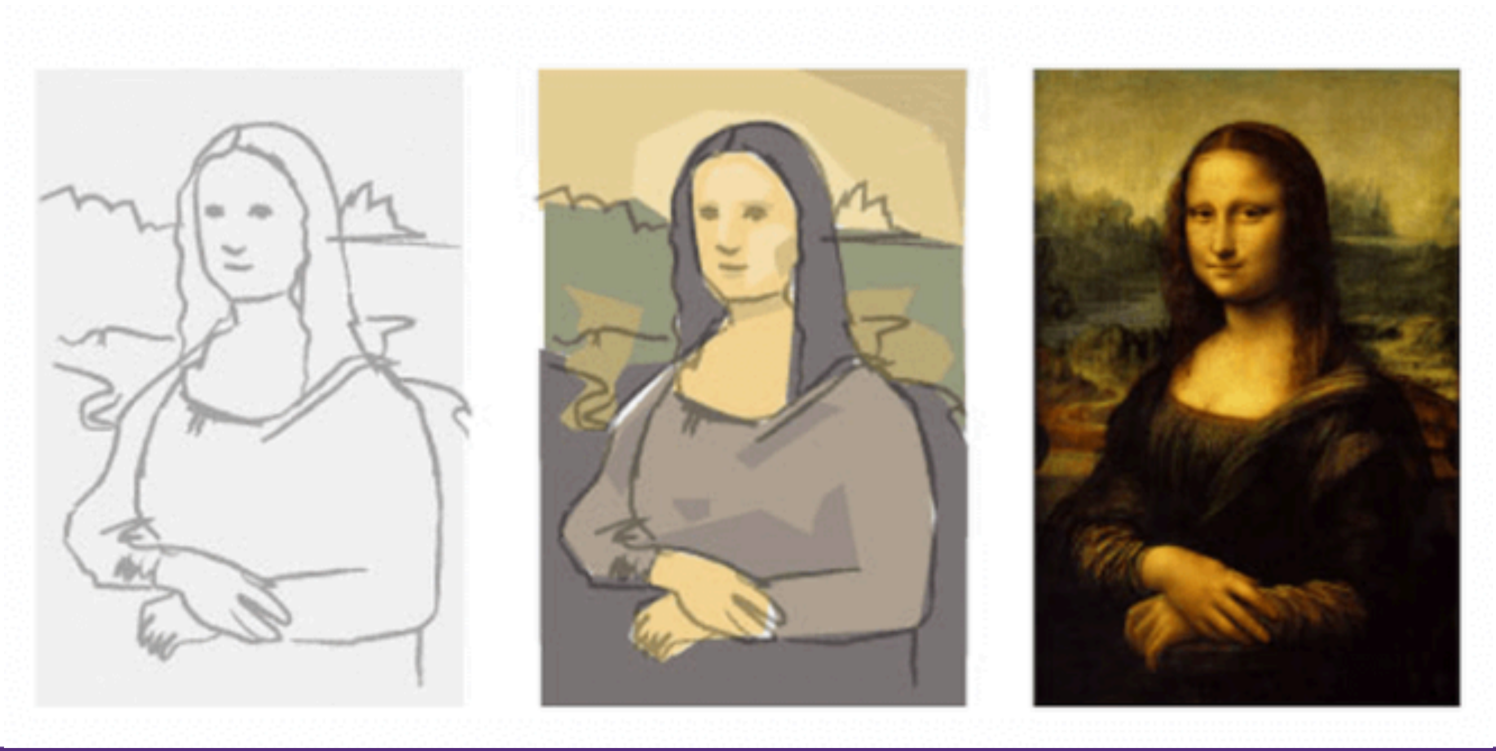
“We know what we want. Can you estimate how long it will take to build?”

-AND/OR-

“We need to get these requirements nailed down before we can start development.”

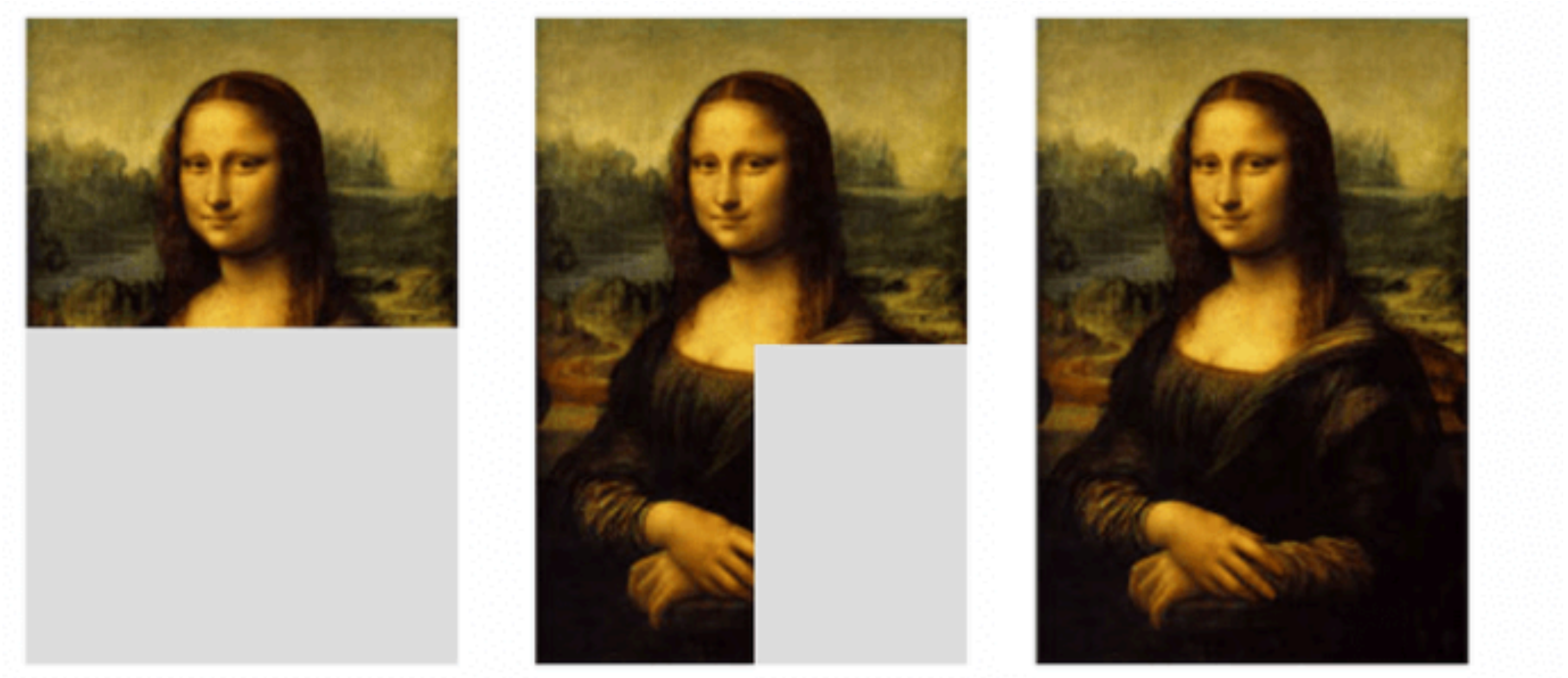
Iterating…

- We iterate to **find the right solution**.
- Then given some good candidate solution, we might then iterate to **improve a candidate solution**.



Incrementing..

- We use incrementing to gradually build up functionality so "if" development takes longer than we expect, we can release what we've built so far.
- We release incrementally so that we actually get the business value we're chasing. We don't really get return on investment until people begin to use the software we've built.



Agile Requires Both

- In Agile we use both of these tactics:
  - During a sprint where we build several user stories some may be adding new functionality, **incrementally**
  - Other tasks may be **iterating** with stories to improve, change, or remove existing functionality.

- Where things really fall apart in Agile development is when <u>no one plans to iterate</u>.

Why?

Spike Iteration(Agile)

Next Quiz

Quiz 2 due 11pm Wed Sept 23 (will open on Sept 21)

The questions are from **Lessons 7-10**. You cannot collaborate with your classmates about this quiz prior to, or during the taking of the quiz. **NOTE:** Once you start the quiz you will have only 15 minutes to complete it. Be sure to review the lessons before you begin.