

Agile Design Process

UCSB Robotics, Winter 2021 | Alex Mei

SHORT INTROS

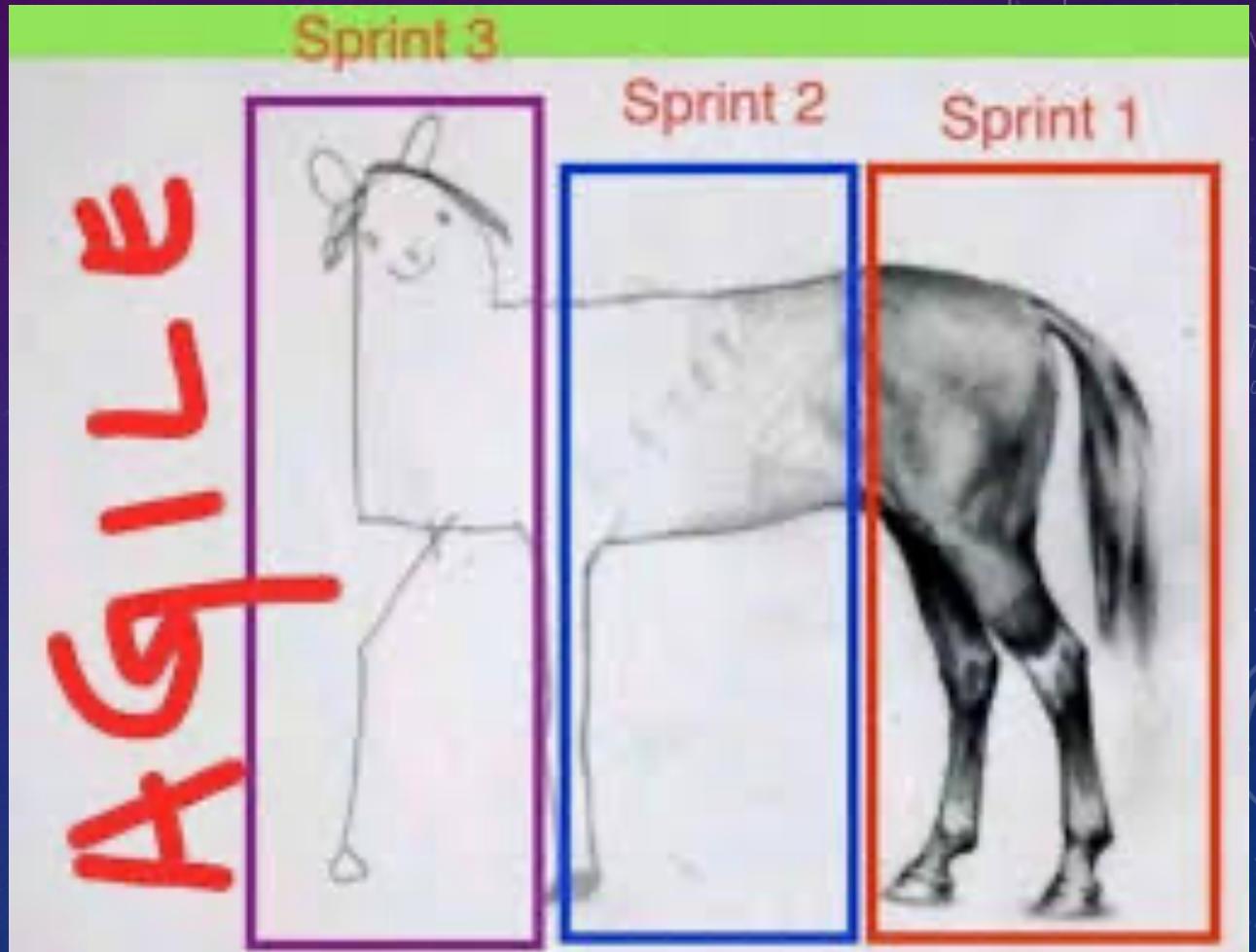
Please share the following:

- Your Name
- Your Year
- Your Major
- Favorite Drink?



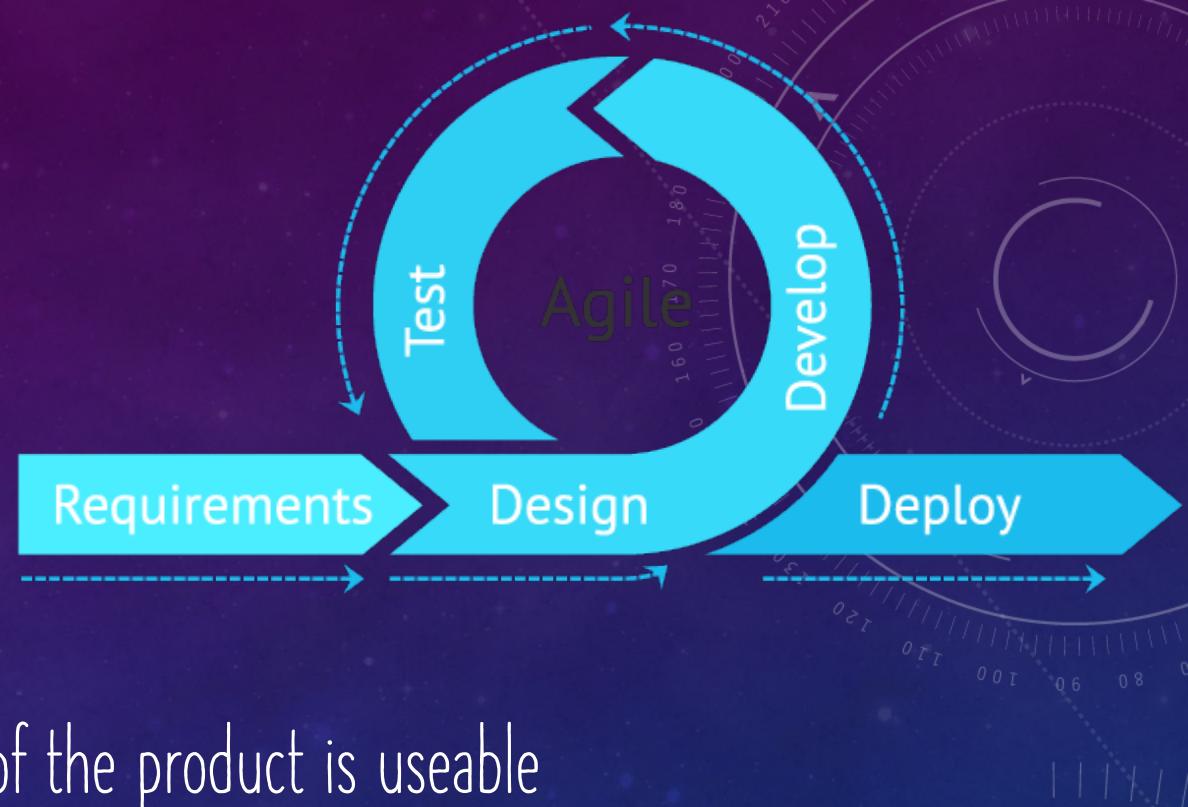
DAILY RUNDOWN

- What is Agile?
- Why Agile?
- Agile Design
- Project Design Session



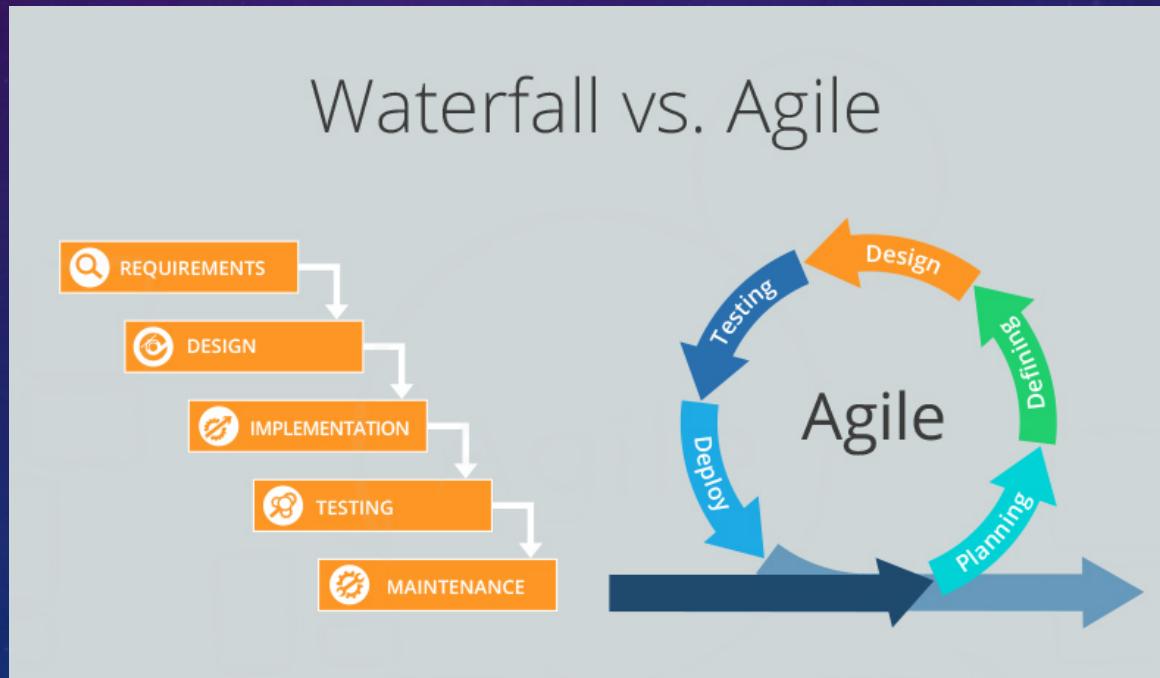
WHAT IS AGILE?

- Agile: the ability to create and respond to change
- Incremental Development: each successive version of the product is useable
- Iterative Development: allow for repeating software activities and revisiting of products
- User Stories: functionality the consumer would want implemented



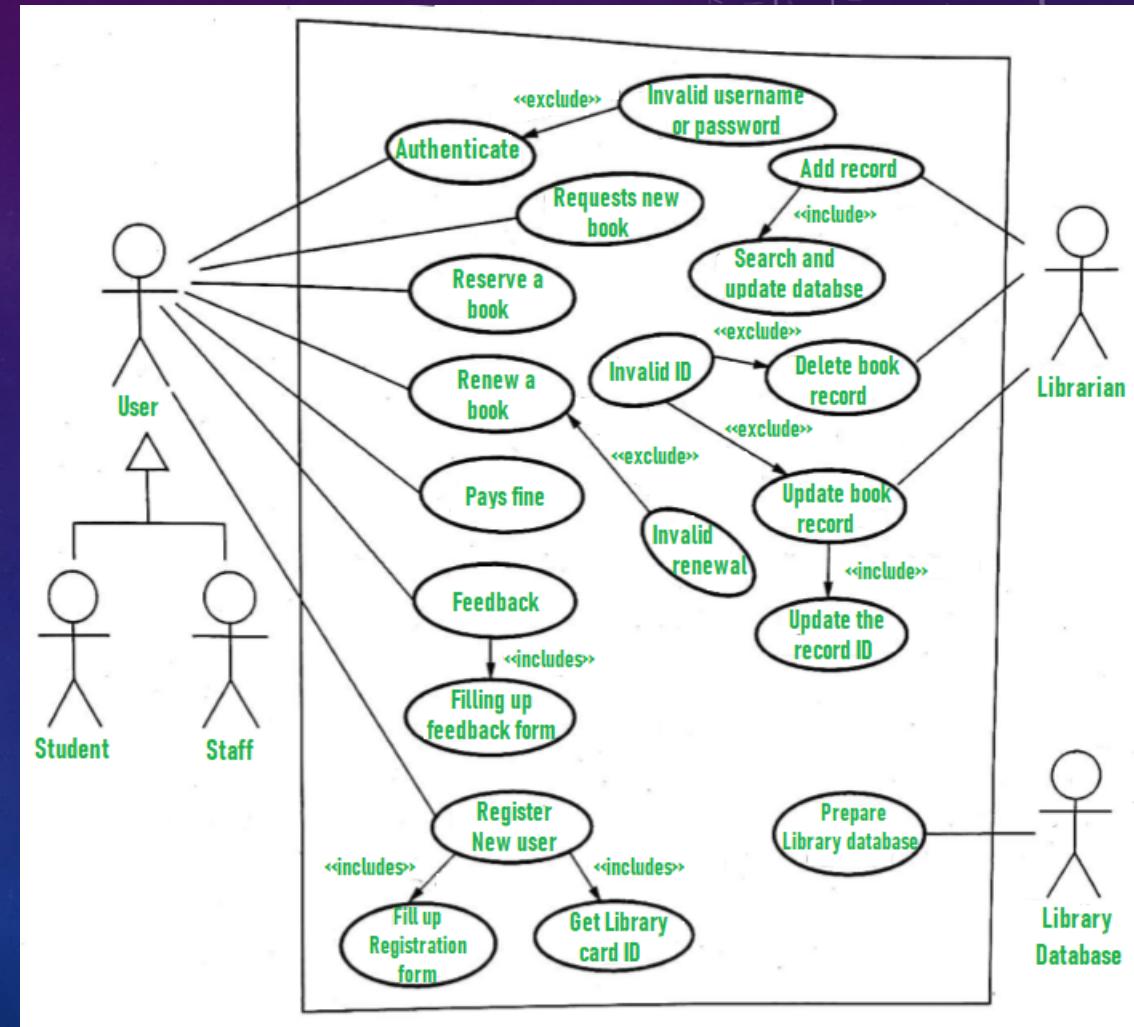
WHY AGILE? WATERFALL VS ITERATIVE

- Waterfall Method: linear project management approach



WHY AGILE? USER STORY DRIVEN

- Develop with the end use case in mind
- If no one uses it, it's wasted effort
- Maximize effort on critical features



AGILE DESIGN

1. Identify the overarching problem
 2. Determine possible use cases (possible subproblems)
 3. Design system with ability to perform all use cases
- Note: design can and should overlap to improve over time

EXAMPLE: BLOCK IT OUT



Problem: given four blocks with a different color on each side, stack the blocks so that one color does not appear more than once on each column

Use Case 1: given input of n blocks, determine whether the puzzle can be solved

Use Case 2: given input of n blocks with different markings, determine solution

Use Case 3: given input of non-cube shaped blocks, determine solution

EXAMPLE: BLOCK IT OUT - DESIGN



- Represent each block as a six-element vector (OOP not necessary)
- Plug 2D Vector (vector containing 4 six-element vectors) in ML algorithm
- First, solve it yourself; then, determine ML algorithm to solve
- Lastly, format output as desired

EXAMPLE: BLOCK IT OUT - SOLVE IT YOURSELF



- Game: <https://www.jaapsch.net/puzzles/javascript/insanitj.htm>
- Solution: https://www.youtube.com/watch?v=IKZg2lle_hQ

WHICH OF THE FOLLOWING IS BEST ALIGNED WITH THE AGILE METHODOLOGY?

I. Following a Plan

II. Comprehensive Documentation

III. Responding to Change

IV. Working Software

A) IV only

B) I and II

C) II and IV

D) III and IV

E) I, III, IV

F) I, II, III, IV

WHICH OF THE FOLLOWING IS NOT AN AGILE PRINCIPLE?

- A) Simplicity, the art of maximizing work not done, is essential.
- B) The best architectures, requirements, and designs emerge from self-organizing teams.
- C) Working software is the primary measure of progress.
- D) Build projects around motivated individuals.
- E) All the above are all Agile principles.

PROJECT FORMATION

- Form and confirm project groups and ideas
- Spend time to get to know each other!
- Icebreaker: 2 minutes to find the an item that represents a hobby of yours

PROJECT DESIGN

- Complete Design Planning Worksheet (Resources folder)
- Time permitting, start learning and/or implementation for your project!

