

Kanban and Trello

COMPSCI5059 - Software Engineering

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Slides are based on the lecture notes by Ron Poet

Kanban board example used on slides 4, 7-9 are from Wikipedia: https://en.wikipedia.org/wiki/Kanban_board

The remaining figures are from flaticon.com

Overview

- Kanban - Introduction
- Kanban Principles
- Scrum vs. Kanban
- Kanban Metrics
- Trello

Kanban - Introduction

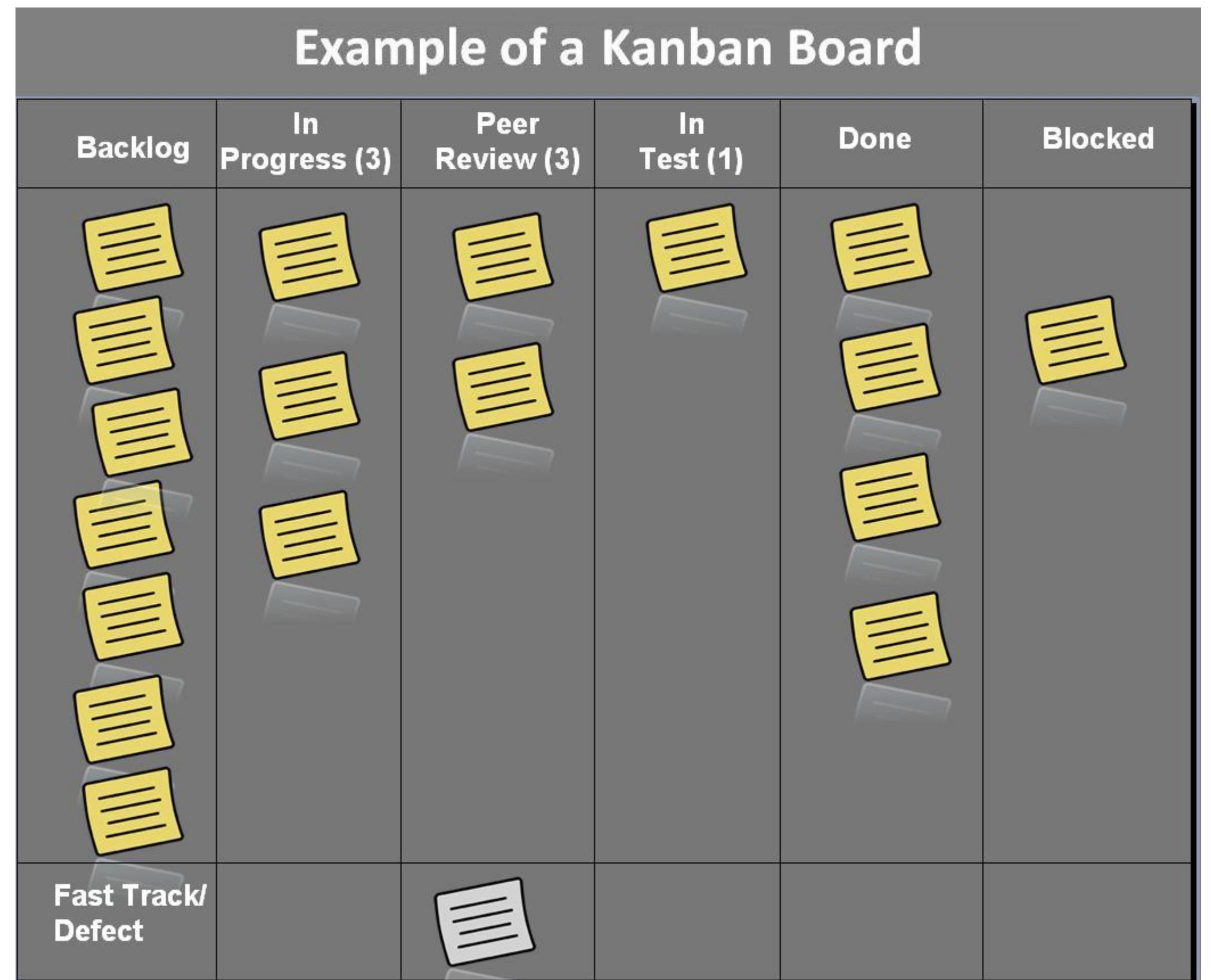
- Kanban is a Japanese word that means **signboard** or **billboard**.
- The underlying kanban method originated in lean manufacturing inspired by the Toyota Production System in 1940s.

Kanban - Introduction

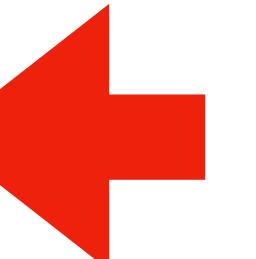
- Kanban is a framework like Scrum: it does not prescribe how the work is done in detail.
- Kanban is less formal than Scrum.
- Kanban can be used for many tasks, not just software development.

Kanban Board

- Kanban board is divided into lanes with cards representing work to be done.
 - Cards move from lane to lane as they are completed.



Overview

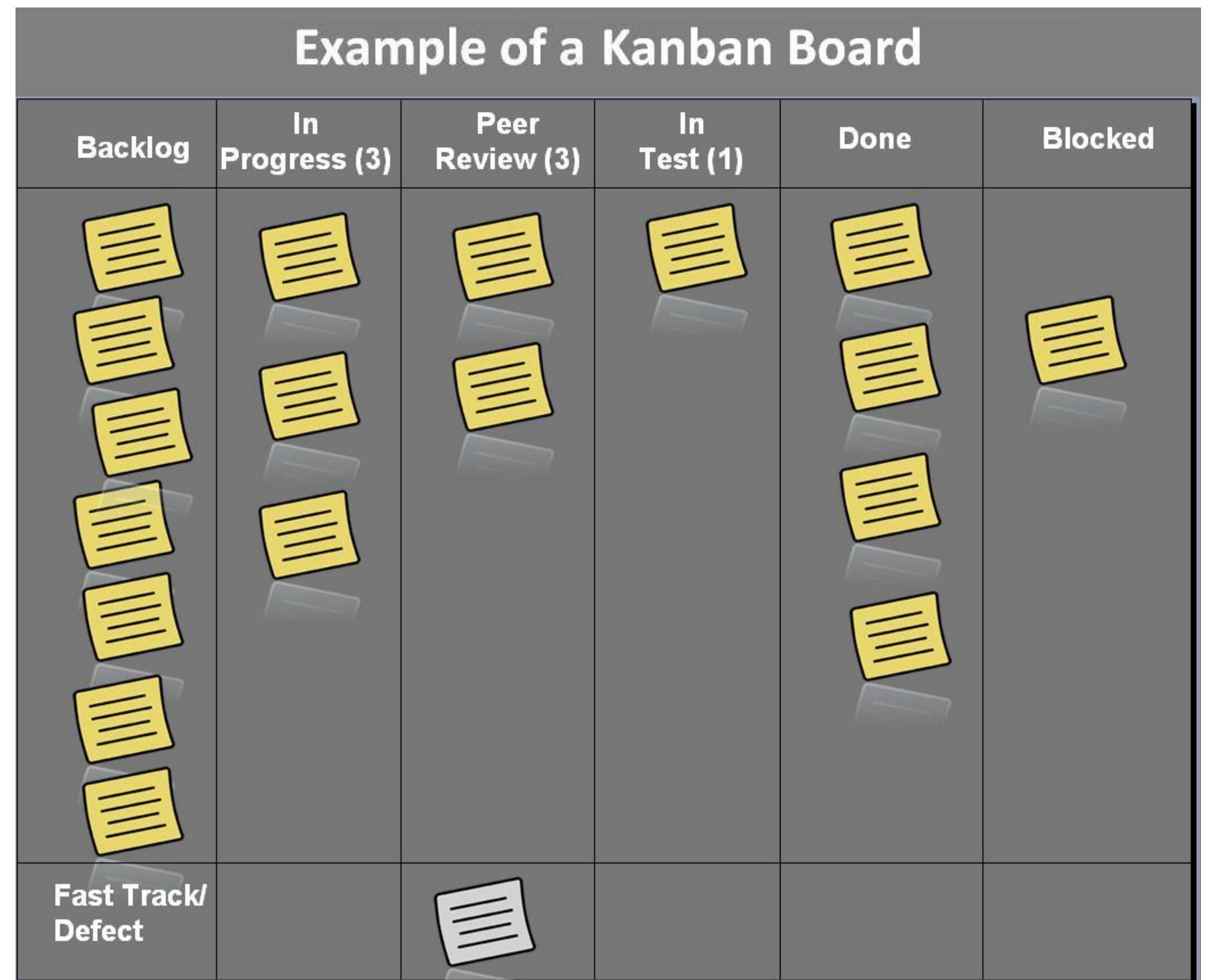
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4 Principles of Kanban

- Visualise Workflow
- Limit Work In Progress (WIP)
- Focus on the Flow
- Continuous Improvement

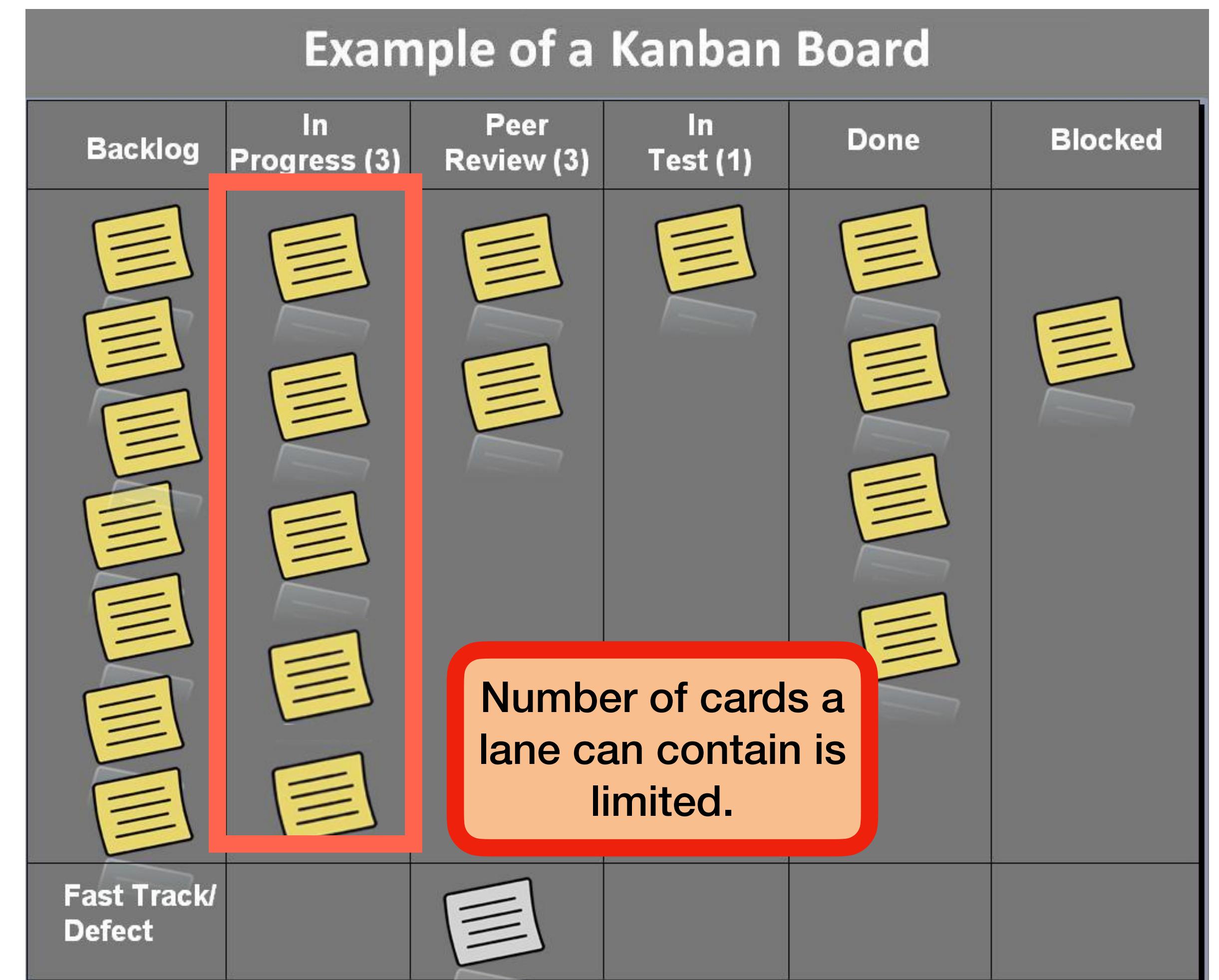
Visualise Workflow

- It is easy to see the “Big Picture” since all the work that is still to be done appears on one board.
 - Each task fits into a single card or a single post-it note.



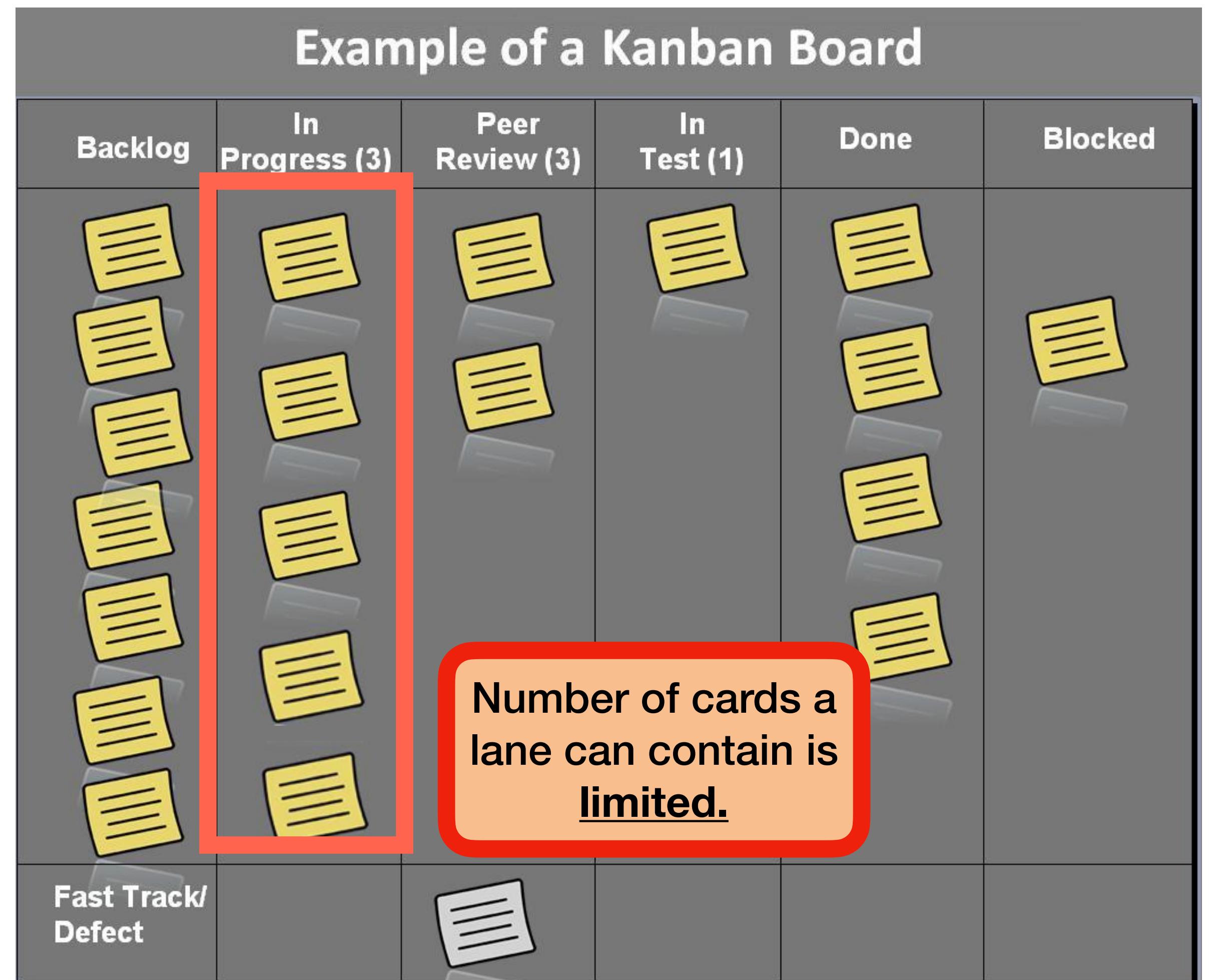
Limit Work In Progress (WIP)

- Each lane has a limit in the number of cards it can contain.



Limit Work In Progress (WIP)

- Each lane has a limit in the number of cards it can contain.
- This reduces the number of partially completed tasks.
- If a lane fills up then one of the partially finished tasks must be completed and move to another lane to make room for a new card.



Focus on the Flow

- There are metrics to measure progress:
 - Work In Progress or Process (WIP)
 - Queues
 - Blockers
 - Lead Time and Cycle Time
 - Throughput

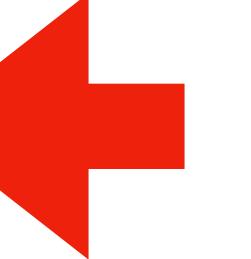
Continuous Improvement

- Unless you are operating at maximum efficiency, you will need to keep improving.
- As you start to implement Kanban, you will need to adjust to keep improving.

Overview

Kanban - Introduction

Kanban Principles

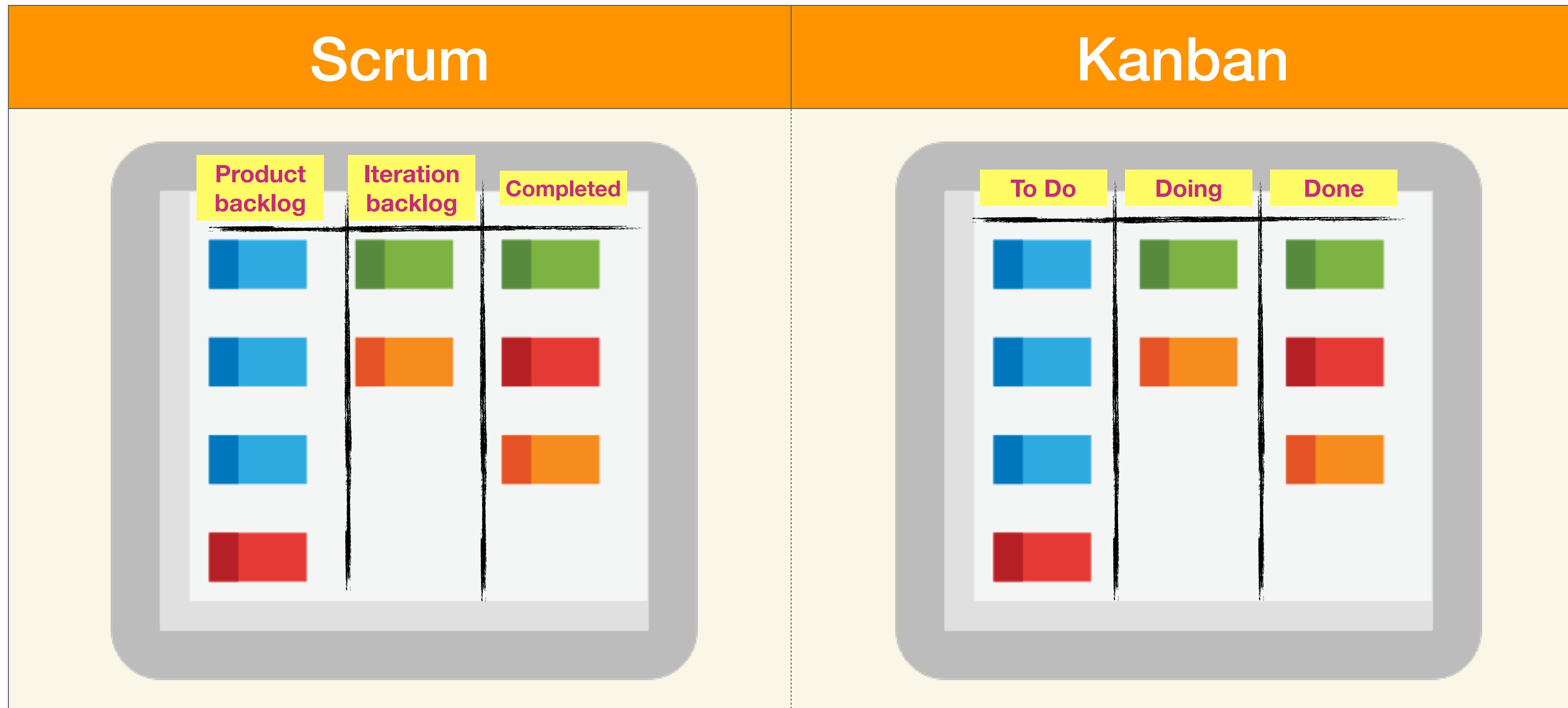
Scrum vs. Kanban 

Kanban Metrics

Trello

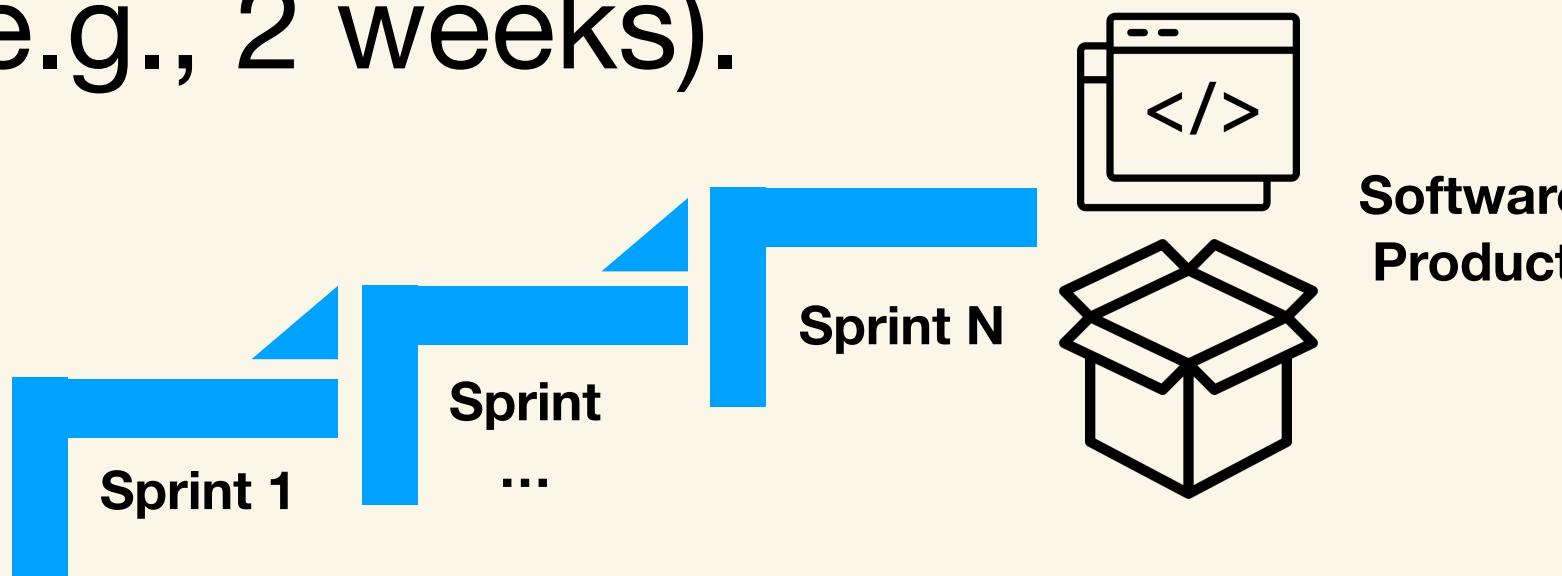
Scrum vs. Kanban

Usage of Cards: Both use cards to define work to be done.



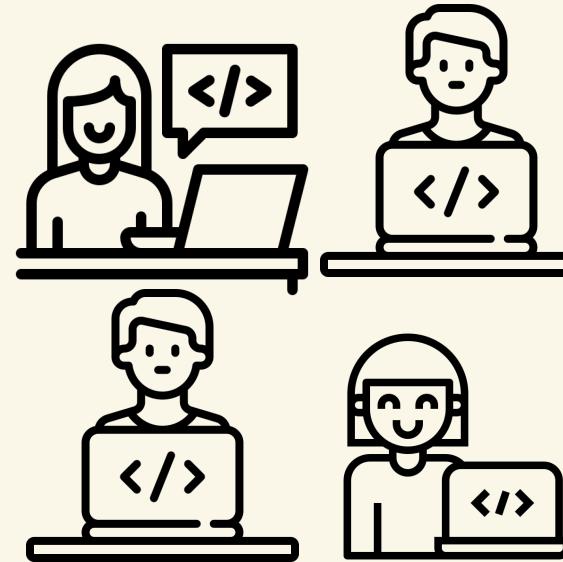
Scrum vs. Kanban

Cadence: Fixed length sprints (iterations) vs. continuous flow

Scrum	Kanban
<p>Regular, fixed length sprints (e.g., 2 weeks).</p> 	<p>There is continuous flow, but the number of cards that can be put in a <u>lane</u> are <u>limited</u>.</p>
<p>Fixed iteration cycles in scrum also limits the number of user stories that are in progress and satisfies the <u>lane limit</u> so that there are not many incomplete user stories.</p>	

Scrum vs. Kanban

Roles in a Team:

Scrum	Kanban
 Product owner	No required roles. Kanban does not say anything about how the work is done.
 Scrum master	
 Scrum Team	

Scrum vs. Kanban

Effort Estimation:

Scrum	Kanban
<p>Scrum uses Story Points (SPs) to estimate effort for each user story.</p> <p>Each user story is split into tasks and time needed for each task is estimated in ideal hours.</p> <p>1 story point = 1 ideal day = 8 ideal hours.</p>	<p>Kanban does not have a system to estimate effort for each task.</p>

Scrum vs. Kanban

Task Prioritisation:

Scrum	Kanban
Scrum uses MoSCoW system to prioritise user stories.	Kanban uses MoSCoW system to prioritise tasks.
Both Scrum and Kanban use MoSCoW system for user story/task prioritisation.	

Scrum vs. Kanban

Practices:

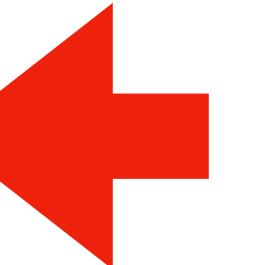
Scrum	Kanban
<ul style="list-style-type: none">• Sprint (iteration) planning,• Daily scrum,• Sprint review and• Sprint retrospective.	<ul style="list-style-type: none">• Visualise the flow of work,• Limit Work in Progress (WIP),• Manage flow,• Incorporate feedback loops.

Overview

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Kanban Principles

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Kanban Metrics 

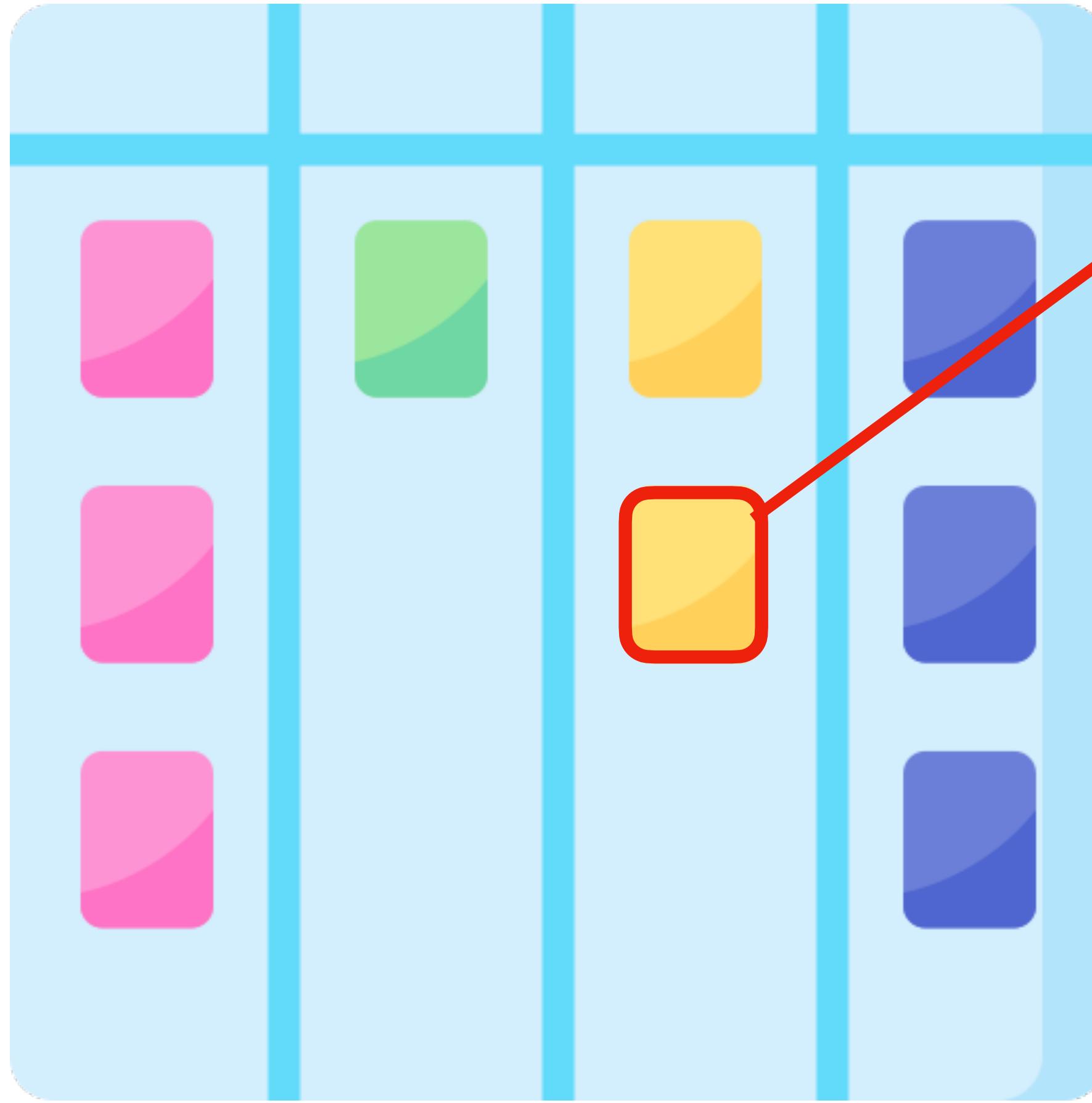
Trello

Kanban Metric: Work In Progress/Process (WIP)

- WIP refers to both **Work In Progress** and **Work In Process**.
- **Work In Progress** is the total amount of work that is *still* to be done.
- **Work In Process** Is the total amount of work that is *currently* being worked on.

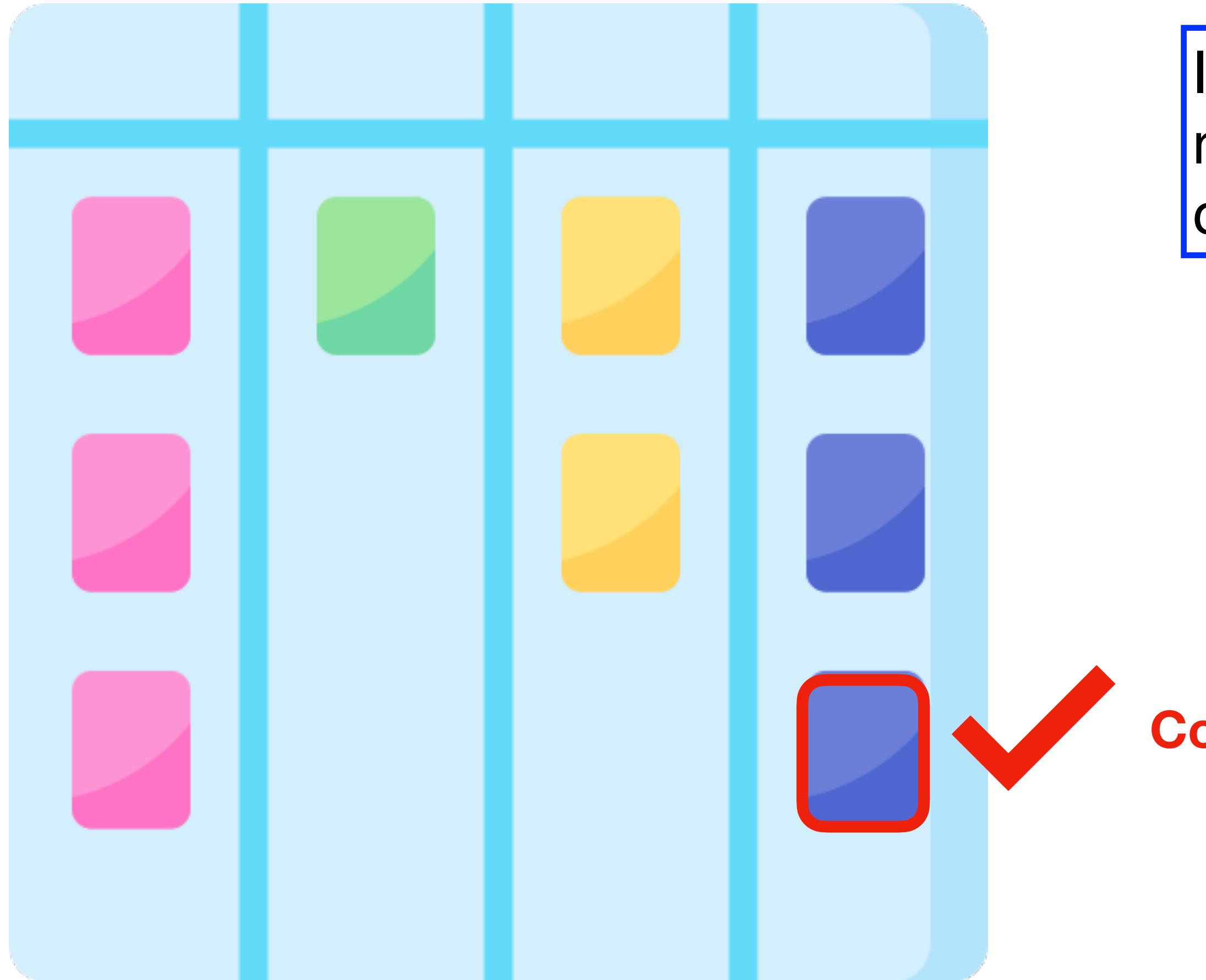
Scrum	Kanban
Product Backlog (measured in total number of SPs)	Work In Progress (measured in the total number of tasks)
Sprint (iteration) backlog (measured in total number of SPs)	Work In Process (measured in total number of tasks).

Kanban Metric: Queues



Tasks that have finished one stage of processing can wait to go to the next stage because of the lane limit (i.e., the next lane is full)

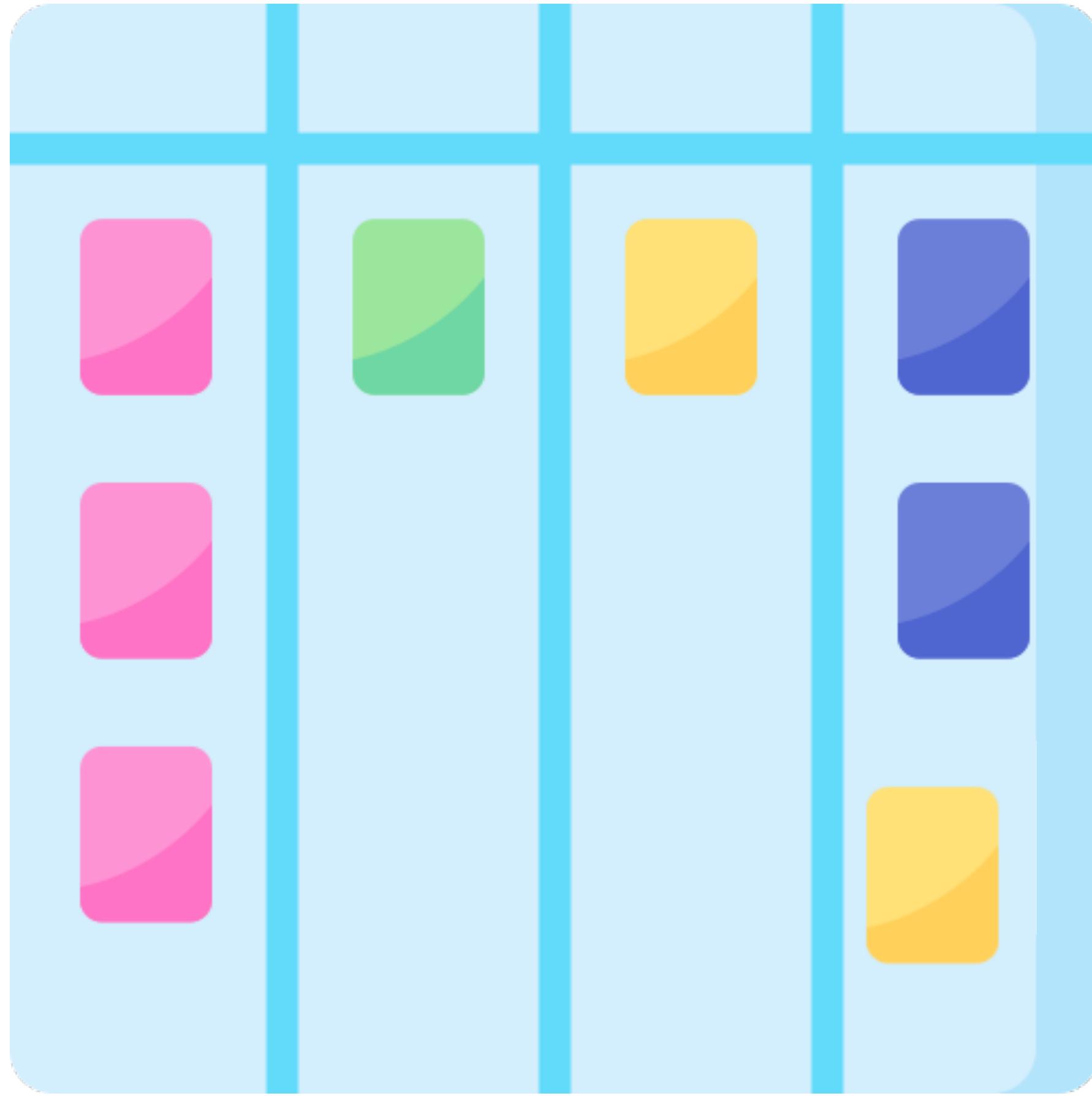
Kanban Metric: Queues



In such a case, a task can move to the next lane only if a task in the next lane is completed.

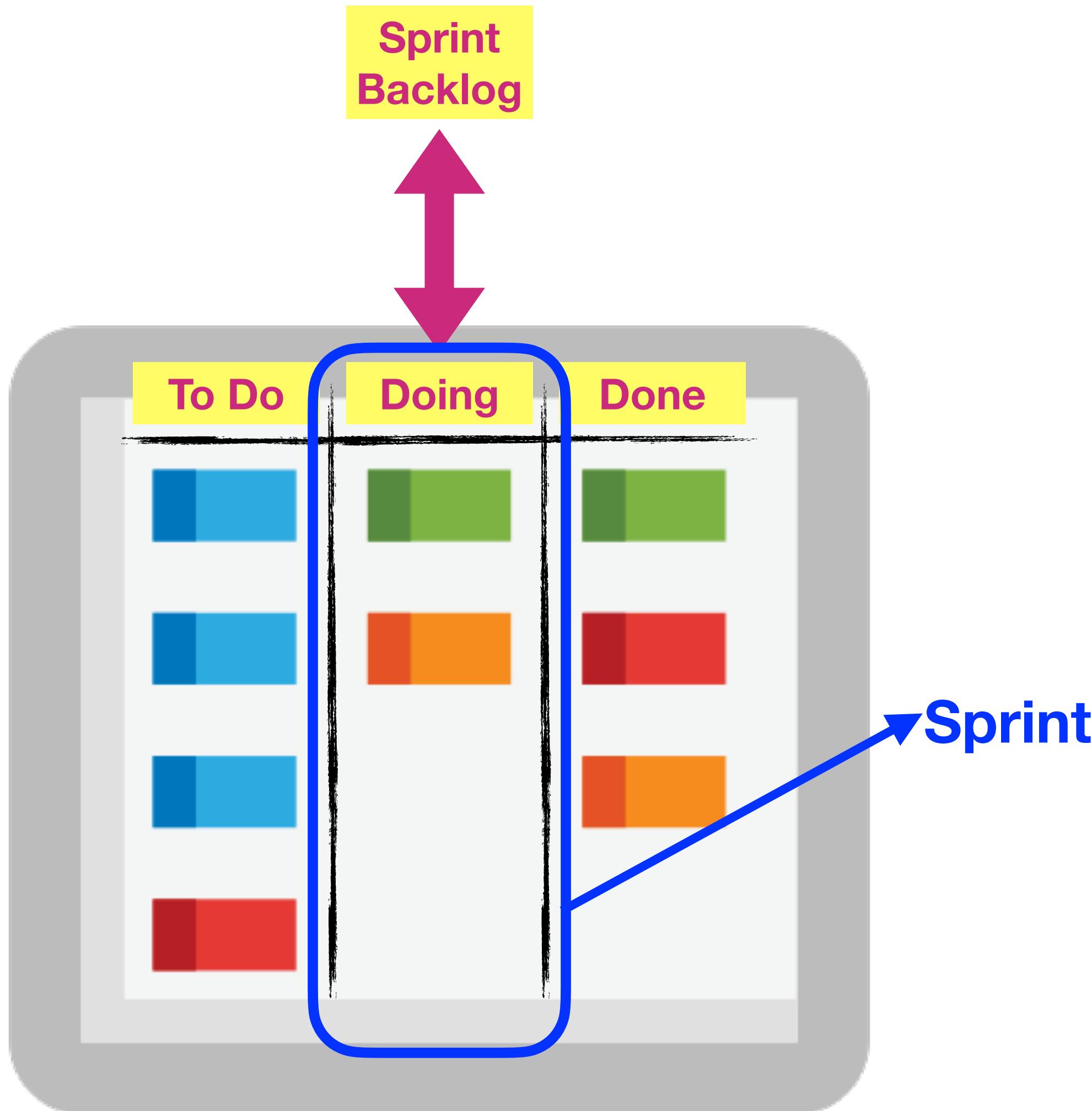
Completed

Kanban Metric: Queues



In such a case, a task can move to the next lane only if a task in the next lane is completed.

Kanban Metric: Queues



This concept is less useful for software development because there is basically only one lane where work is going on, the sprint.

Kanban Metric: Blockers

- Blockers are tasks that can't move to the next lane because they are waiting for some external information.
- Blockers can't move forward even if there is space in the next lane.
- In the software development context, stories can be blocked for a number of reasons:
 - Waiting for information from the customer.
 - Waiting for the result of an experiment (spike).

Kanban Metric: Lead Time

Lead time is the time it takes for an item to be delivered to the customer.

- Measured from initial request to final delivery.
- In software development it is the project elapsed time.

Kanban Metric: Cycle Time

Cycle time is the average time that an item stays in one lane.

- In software development, this is the iteration length.

Kanban Metric: Throughput

Throughput is the average number of items processed in a given time unit.

- Items per week.
- In software development it is the average number of story points completed per iteration.

Kanban Summary

- Kanban is a general purpose approach with less structure than Scrum.
- Many project teams are using hybrid development models that are influenced by both Kanban and Scrum.
- Kanban is often adapted as a way of visualising progress of user stories in Scrum.
 - A Kanban board with story cards pinned to the board.
 - Kanban can be modelled using Trello, a web-based application/tool.

Kanban Summary

- **Further Reading:** Max Rehkopf, “Kanban vs. Scrum: which agile are you?,” <https://www.atlassian.com/agile/kanban/kanban-vs-scrum>

Interactive Exercise

- Use your computer or smartphone to access the exercise
- If you use your **computer** or **smartphone**: Open a web browser, enter **www.menti.com** and enter code **4903 6498**
- With your smartphone you can also use the following QR code



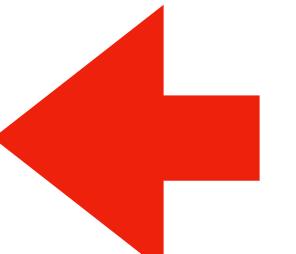
Overview

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Trello 

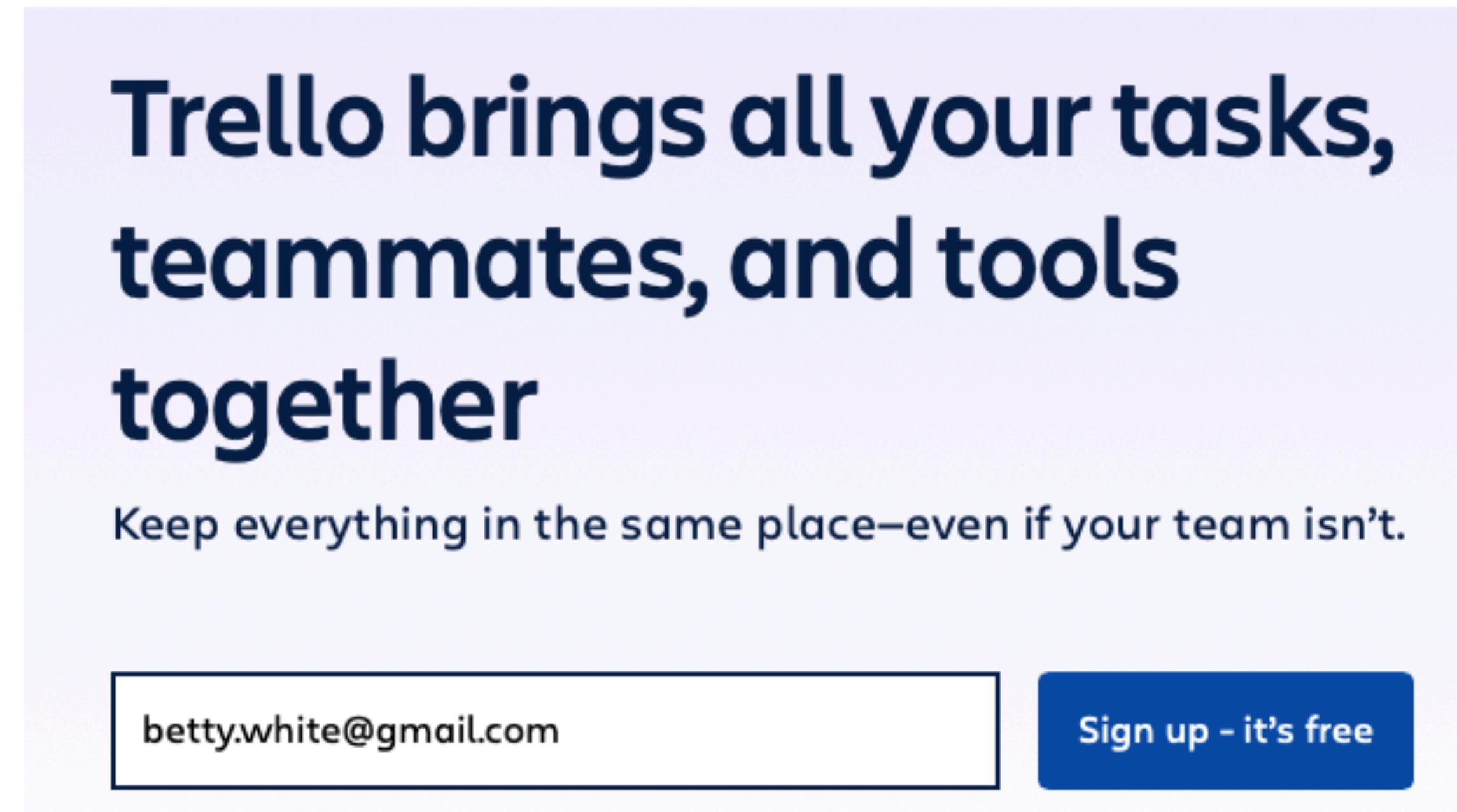
Trello

- Trello is a web-based application that is basically a Kanban board that can be shared between users.
- Trello has a free basic version, which you will use in your Assessed Exercise 1.

The screenshot shows the official Trello website homepage. At the top, there is a navigation bar with the Trello logo, followed by links for Features, Solutions, Plans, Pricing, and Resources. To the right of the navigation bar are Log in and Get Trello for free buttons. The main content area features a large, bold headline: "Trello brings all your tasks, teammates, and tools together". Below the headline is a subcopy: "Keep everything in the same place—even if your team isn't.". At the bottom of the main section are two buttons: "Email" and "Sign up - it's free". To the right of the main content is a vibrant, colorful illustration depicting various team members and tools like a laptop, a smartphone, and a tablet, all working together on a collaborative project.

Trello - Creating an Account

- You can sign up to Trello by entering your email address and selecting a password.



Trello - Creating a Team

The screenshot shows the Trello workspace creation interface. On the left, there's a sidebar with options like Boards, Templates, Home, Workspaces, and Members. A red box highlights the 'Members' button. A yellow callout box points to it with the text: "1. Press '+' sign to add members to your team". A large red arrow points from this step to a modal window on the right. The modal is titled "Invite to Workspace" and contains a text input field with the email "John.smith@gmail.com", which is also highlighted with a red box. Below the input field, there's a user profile for "John" and a note about an unverified account.

1. Press "+" sign to add members to your team

2. Enter email address of each person you want to include in your team.

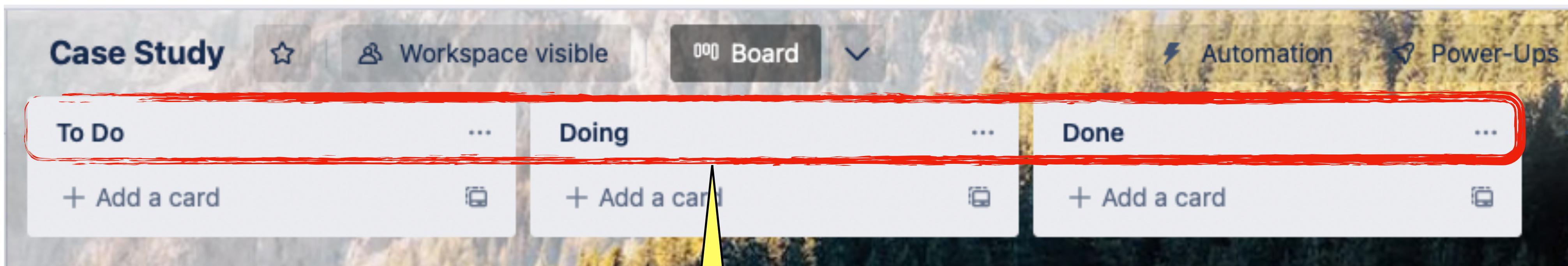
Trello - Creating a Board

The image shows the Trello workspace interface. On the left, there's a sidebar with options like 'Boards', 'Templates', and 'Home'. A red box highlights the 'Boards' tab under 'Trello workspace'. In the center, there's a 'Most popular templates' section with a 'Kanban Template' card. At the bottom, there's a 'Your boards' section with a 'Welcome Board' card and a 'Create new board' button. On the right, a 'Create board' dialog box is open, showing fields for 'Board title' (with a red box around it), 'Background' (with a red box around the first image), 'Visibility' (set to 'Workspace'), and a note about 'Board title is required'. Three yellow callout boxes with black text provide instructions: 1. 'Press "Boards" tab' (pointing to the sidebar), 2. 'Press "Create new board" tab' (pointing to the 'Create new board' button), and 3. 'Write board title' (pointing to the 'Board title' field).

1. Press "Boards" tab
2. Press "Create new board" tab
3. Write board title

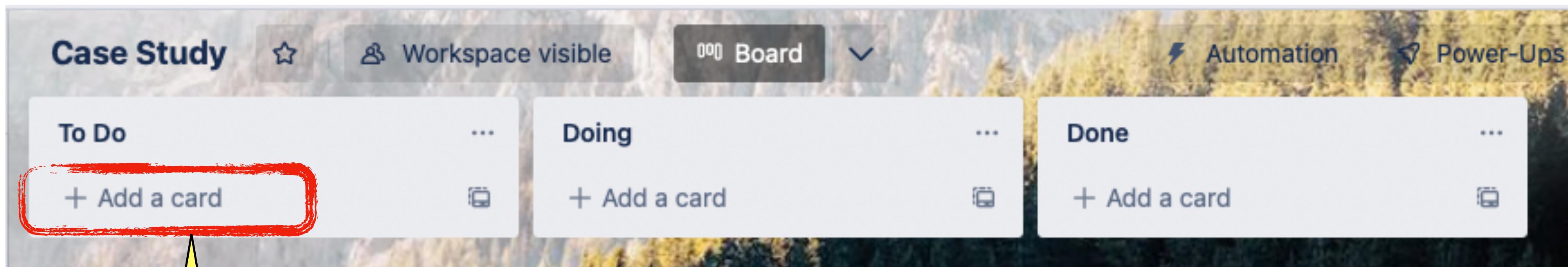
Trello - Creating a Board

- Use the Case Study from last week.
- Provide a title and get three standard lanes.



You can also name the lanes as “Product Backlog”, “Sprint1”, ..., “SprintN”, where N is the total number of sprints (iterations).

Trello - Adding Cards



Press “+” sign to add a card for a user story.

Trello - Adding Cards

The image shows a Trello board titled "Case Study". The board has three columns: "To Do", "Doing", and "Done". The "To Do" column is highlighted with a red box and contains the following cards:

- Search for books
- View Book Details
- Put Books in Cart
- Remove Books from Cart
- Edit Addresses and Card Numbers

A yellow callout bubble points to the "To Do" column with the text "Cards added for each user story".

The "Doing" and "Done" columns each have a "+ Add a card" button.

Trello - Adding Cards

The screenshot shows a Trello board titled "Case Study". The board has three lanes: "Product Backlog", "Sprint 1", and "Sprint 2". Each lane has a "Search for books" input field and a "+ Add a card" button. The "Sprint 1" and "Sprint 2" lanes are highlighted with a red rounded rectangle. A yellow callout box points to the "+ Add a card" button in the "Sprint 1" lane, containing the text: "Alternatively you can rename lanes “Product Backlog”, “Sprint 1”, “Sprint2”". Another yellow callout box on the right contains the text: "Select a label for the card".

Case Study

Workspace visible

Board

Automation

Power-U

Product Backlog

Sprint 1

Sprint 2

Search for books

+ Add a card

View Book Details

Put Books in Cart

Remove Books from Cart

Edit Addresses and Card Numbers

Rate and Review Books

+ Add a card

Alternatively you can rename lanes “Product Backlog”, “Sprint 1”, “Sprint2”

Select a label for the card

Card Details

Search for books
in list Product Backlog

Members Labels
GC + **Must have** +

Description Edit
User Story: As a user I want to search for a book so that I can find out if that book is sold on the website.
Relevant User Roles: All users
Conversations: Use close matching for typos.
Time Estimate: 1 Story Point (SP)

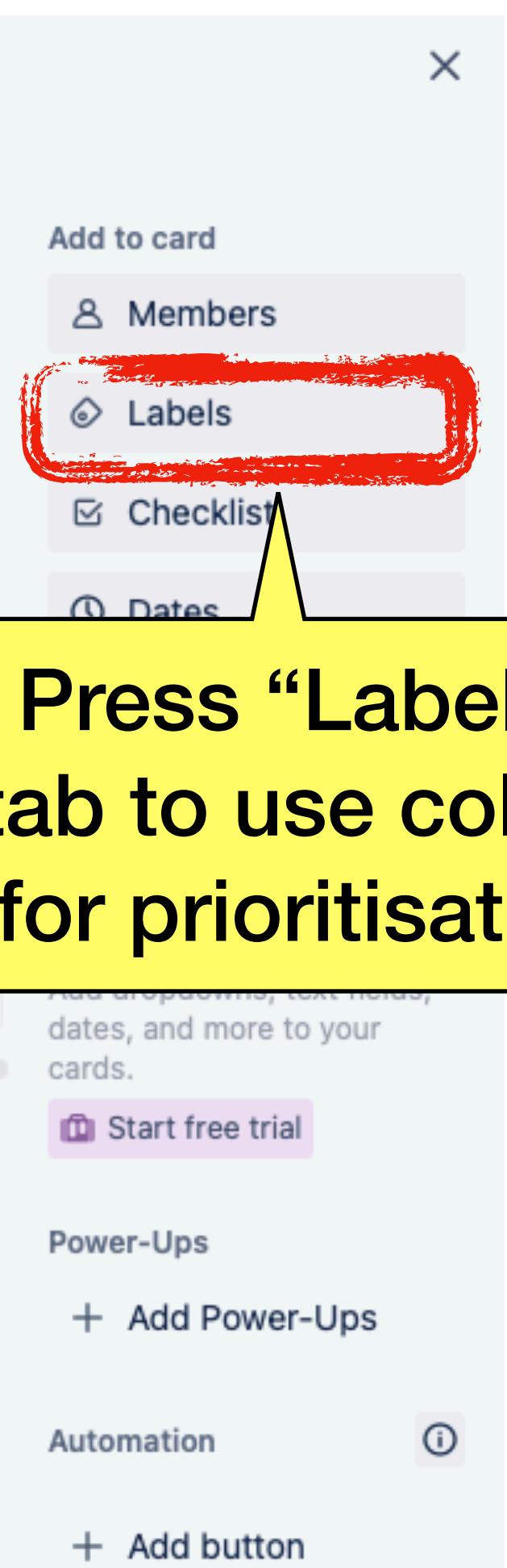
Tests
0%
 Matches one book
 Matches more than one book
 No match
 Close match
Add an item

Add to card
Members
Labels
Checklist
Dates

Delete Add dropdowns, checkboxes, dates, and more to your cards.
Start free trial

Power-Ups
+ Add Power-Ups

Automation
+ Add button



Press “Labels” tab to use colors for prioritisation

Labels

Search labels...

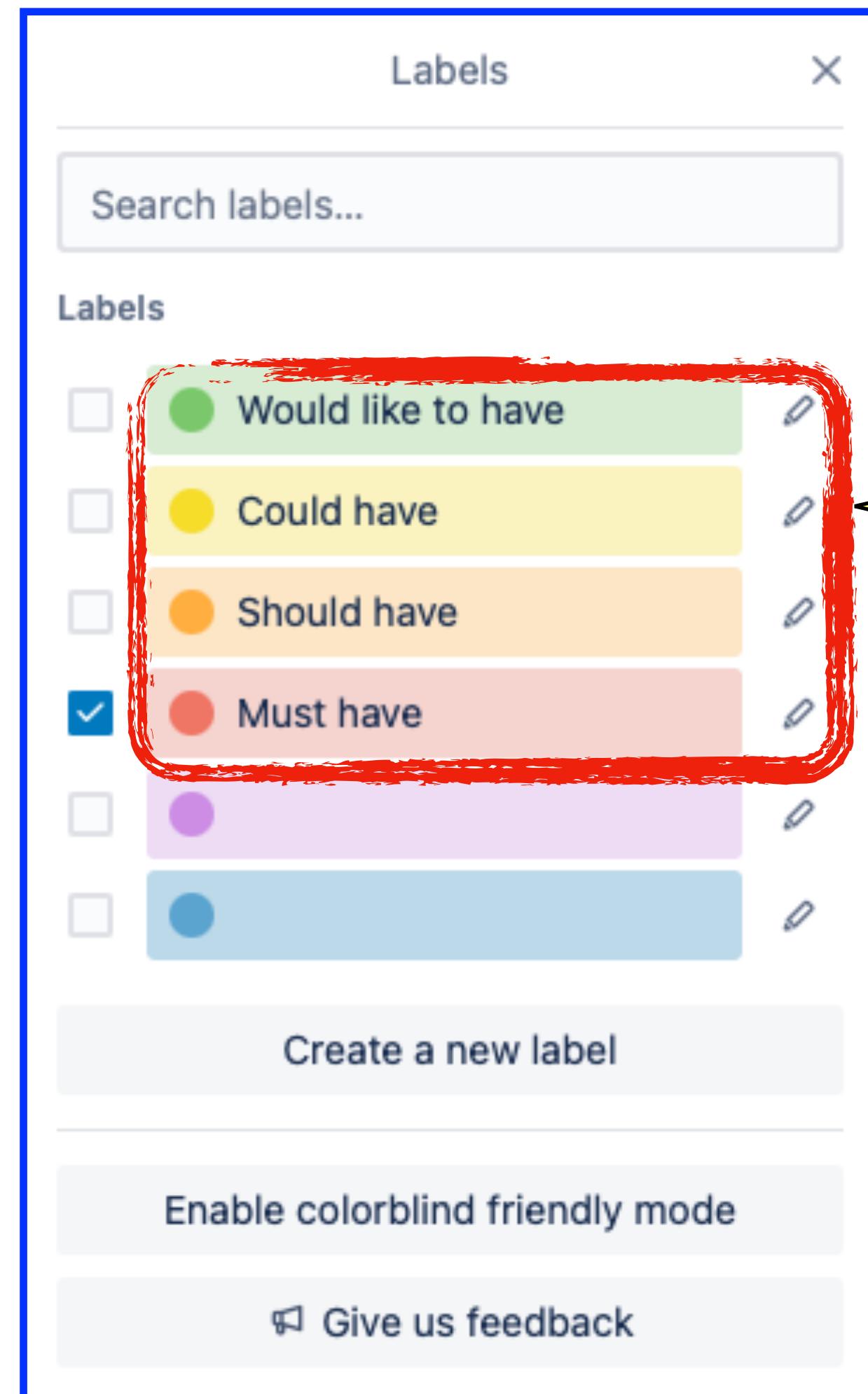
Labels

<input type="checkbox"/>	Would like to have
<input type="checkbox"/>	Could have
<input type="checkbox"/>	Should have
<input checked="" type="checkbox"/>	Must have
<input type="checkbox"/>	
<input type="checkbox"/>	

Create a new label

Enable colorblind friendly mode

Give us feedback



Give title to colors (e.g., Use red for “Must have”)

Card Details

Search for books in list Product Backlog

Members + Labels

GC + Must have +

Description Edit

User Story: As a user I want to search for a book so that I can find out if that book is sold on the website.

Relevant User Roles: All users

Conversations: Use close matching for typos.

Time Estimate: 1 Story Point (SP)

Tests

0% Delete

Matches one book

Matches more than one book

No match

Close match

Add an item

Checklist

Dates

Attachment

Cover

Custom Fields

Add dropdowns, text fields, dates, and more to your cards.

Start free trial

Power-Ups

+ Add Power-Ups

Automation

+ Add button

Label “Must have” (MoSCoW prioritisation).

Labels

Search labels...

Labels

Would like to have

Could have

Should have

Must have

Create a new label

Enable colorblind friendly mode

Give us feedback

Select a label for the card

Card Details

Search for books
in list [Product Backlog](#)

Members Labels
 + +

Description [Edit](#)

User Story: As a user I want to search for a book so that I can find out if that book is sold on the website.

Relevant User Roles: All users

Conversations: Use close matching for typos.

Time Estimate: 1 Story Point (SP)

Tests
0%
 Matches one book
 Matches more than one book
 No match
 Close match

[Add an item](#)

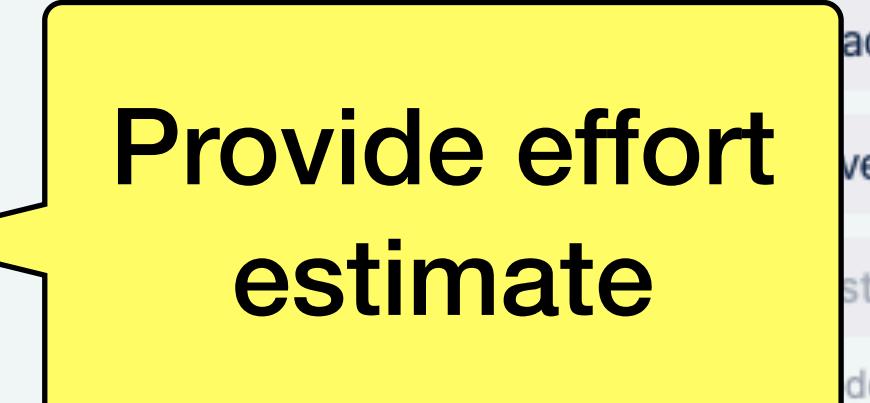
Add to card

- Members
- Labels
- Checklist
- Dates

Attachment
Ever
Custom Fields
Downs, text fields,
dates, and more to your
cards.
[Start free trial](#)

Power-Ups
+ Add Power-Ups

Automation
+ Add button



Provide effort estimate

Card Details

Search for books
in list [Product Backlog](#)

Members Labels
 + +

Description [Edit](#)

User Story: As a user I want to search for a book so that I can find out if that book is sold on the website.

Relevant User Roles: All users

Conversations: Use close matching

Time Estimate: 1 Story Point (SP)

Tests
0%
 Matches one book
 Matches more than one book
 No match
 Close match

Add an item

Add to card

- Members
- Labels
- Checklist
- Dates
- Attachment
- Cover
- Custom Fields

Add dropdowns, text fields, dates, and more to your cards.
[Start free trial](#)

Power-Ups
[+ Add Power-Ups](#)

Automation

+ Add button

Search for books
in list [Product Backlog](#)

Members Labels
 + +

Description [Edit](#)

User Story: As a user I want to search for a book so that I can find out if that book is sold on the website.

Relevant User Roles: All users

Conversations: Use close matching

Time Estimate: 1 Story Point (SP)

Acceptance Criteria
0%
 Given that the user accesses the website of South Coast Nautical Supplies, when the user searches for a book, one book matches.
 Given that ..., when the user searches for a book, there are more than one match.
 Given that ..., when the user searches for a book, there is no match.
 Given that ..., when the user searches for a book, there is a close match.

Add an item

Add to card

- Members
- Labels
- Checklist
- Attachment
- Cover
- Custom Fields

Add dropdowns, text fields, dates, and more to your cards.
[Start free trial](#)

Power-Ups
[+ Add Power-Ups](#)

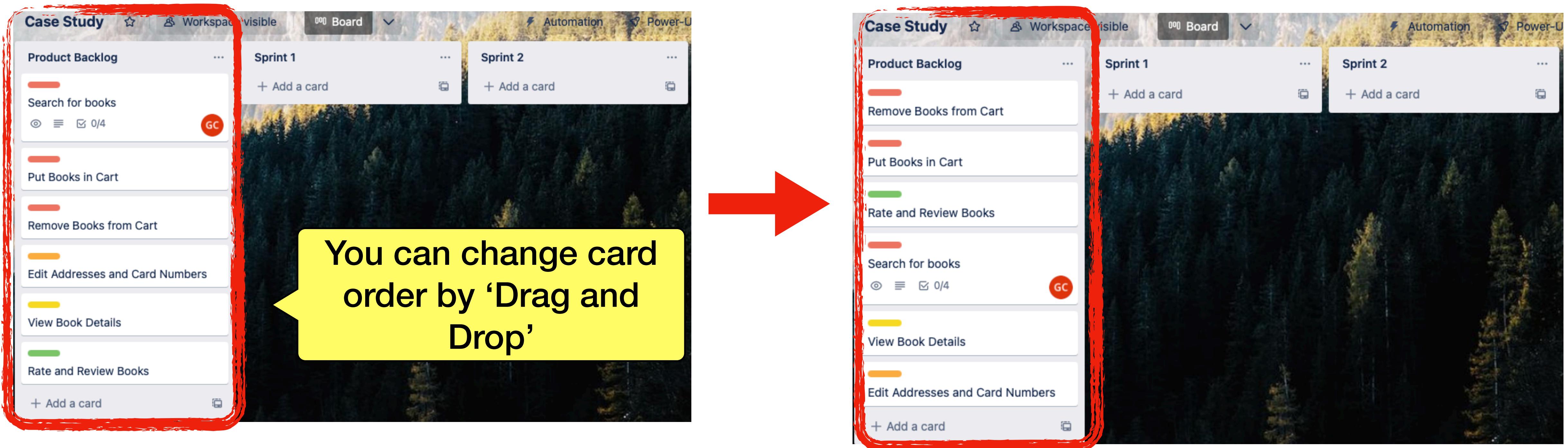
Automation

+ Add button

Actions

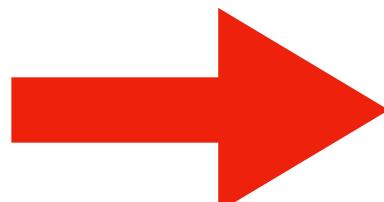
Alternatively, you can write acceptance criteria

Changing Card Order



Changing Lanes

A screenshot of a Kanban board interface. On the left, the 'Product Backlog' sidebar lists several items: 'Search for books' (red), 'Put Books in Cart' (green), 'Remove Books from Cart' (blue), 'Edit Addresses and Card Numbers' (orange), 'View Book Details' (yellow), and 'Rate and Review Books' (purple). Below this is a '+ Add a card' button. The main area shows two columns: 'Sprint 1' and 'Sprint 2'. Each column has a '+ Add a card' button. The background is a scenic forest image.



A screenshot of the same Kanban board after changes. In the 'Sprint 1' lane, the cards are now: 'Remove Books from Cart' (blue), 'Search for books' (red), 'View Book Details' (yellow), and 'Put Books in Cart' (green). The 'Edit Addresses and Card Numbers' card has been moved to the 'Sprint 2' lane. In the 'Sprint 2' lane, the cards are: 'Edit Addresses and Card Numbers' (orange) and 'Rate and Review Books' (purple). A yellow callout box in the bottom right corner contains the text: 'You can change cards' lanes by 'Drag and Drop'.'

You can change cards' lanes by 'Drag and Drop'

Questions

(Please work on the following questions in your free time. Answers will be posted on Moodle next week)

- 1.What is Kanban and what can it do?
2. How does Kanban compare with Scrum?
3. What is Trello and what can it do?
4. How does Trello compare with Scrum?

Case Study

- Continue working on the Case Study that you started previous week (i.e., Online Shopping system for South-east Nautical Supplies).
- You can access the Case Study description under folder “Week2”
- This time, **use Trello while working on the Case Study.**
- To work on this Case Study, you will be assigned to Breakout Rooms (on Zoom)
- You will be working on this Case Study in groups in the designated Breakout Rooms.
- You should be able to share screens in the breakout rooms

The screenshot shows a university LMS interface for the course COMPSCI5059 Software Engineering M - 2022-23. The page title is "COMPSCI5059 Software Engineering M - 2022-23". The breadcrumb navigation shows: Dashboard > My courses > College of Science and Engineering > Schools > Computing Science > Welcome to MSc(IT+) and MSc(CS+) > Compulsory courses (IT+ only) > COMPSCI5059 Software Engineering M - 2022-23 > Semester 1: Lecture Materials and Supporting Documents > Week 2.

The main content area is titled "Week 2". It displays two files: "Case Study.pdf" and "Scrum_Supplementary-Material.pdf". A red arrow points from the text "Download the Case Study" to the "Case Study.pdf" file, which is highlighted with a red oval. Below the files are "Download folder" and "Edit" buttons.