



CO1605

Systems Analysis and Database Design

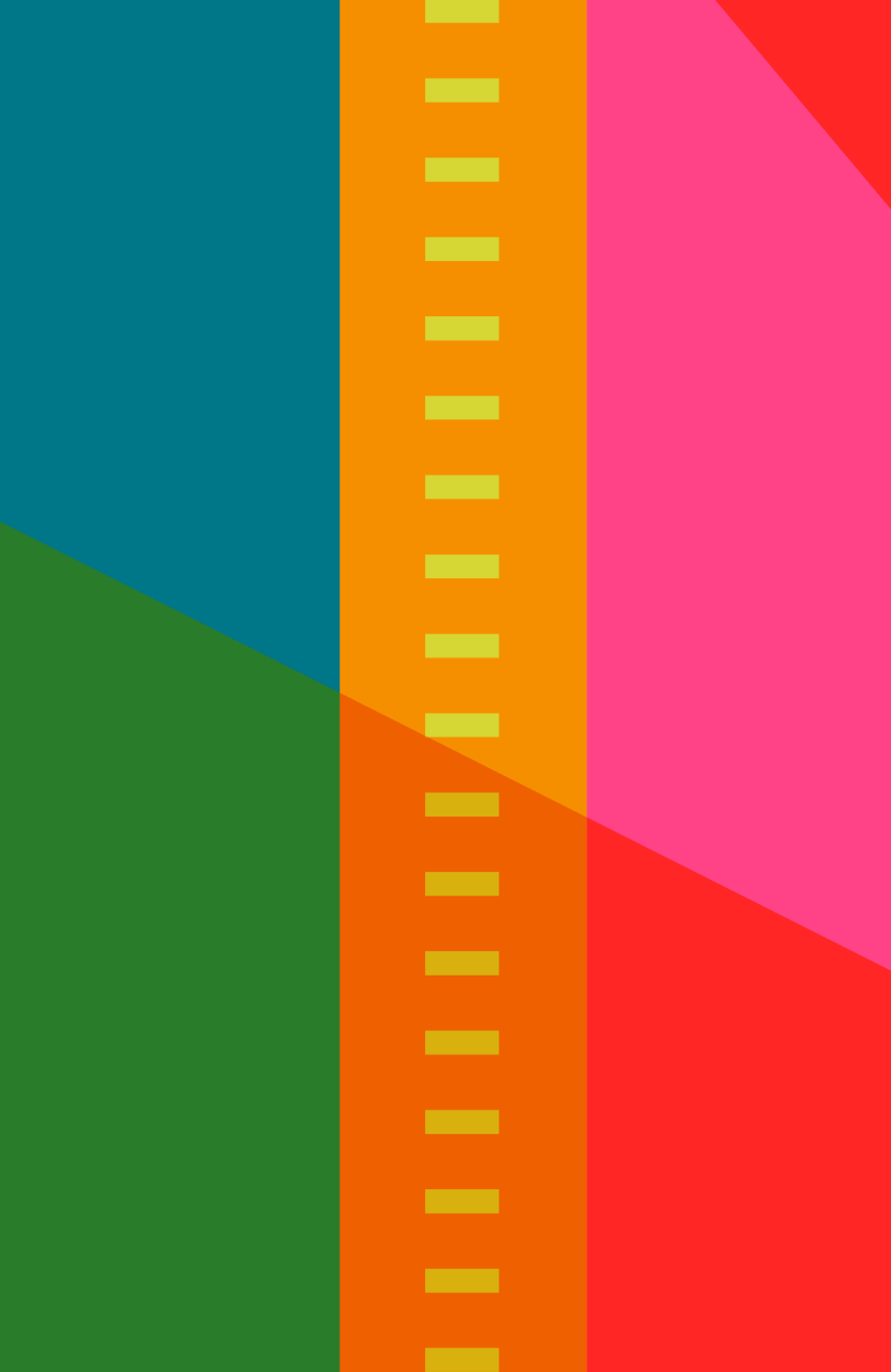
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Describing Use Cases with Textual Descriptions





Learning Outcomes

Students will be able to:

- Identify elements of a variety of diagrams
- Draw (refine) use case diagrams
- Describe a use case using activity diagrams and textual descriptions
- Understand the terminology of the Diagrams

Describing Use Cases

- **Activity Diagrams**
- **Textual Descriptions**
- Sequence Diagrams
- Communication Diagrams

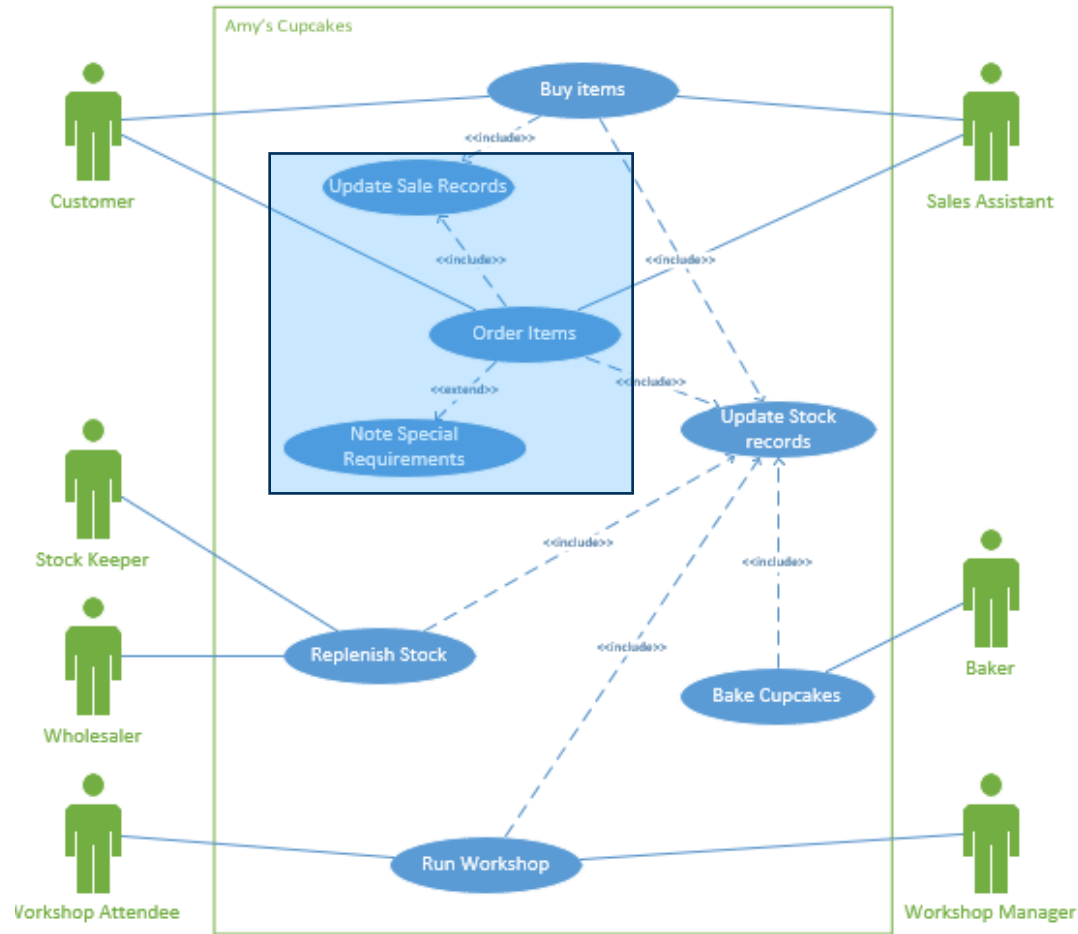


Attend Training Session

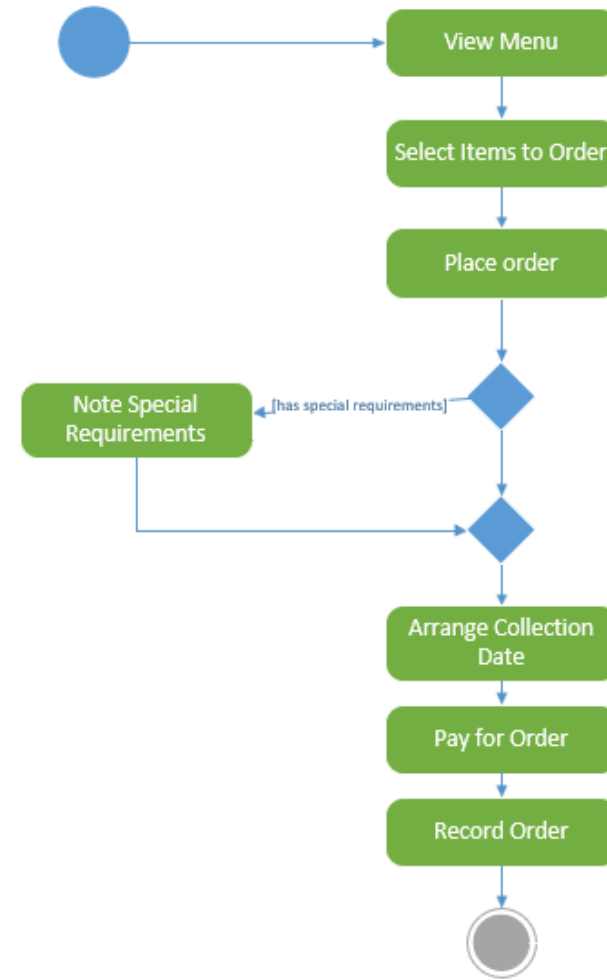


Join Club

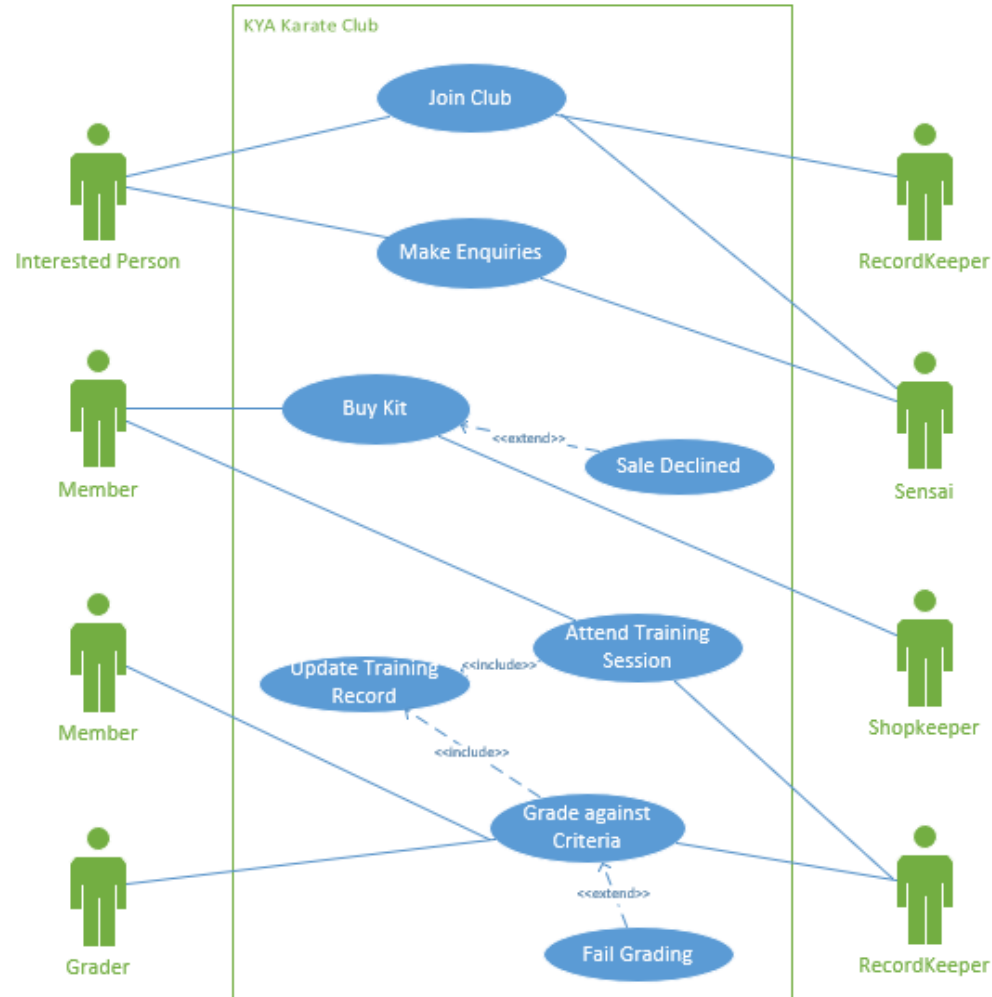
Amy's Cupcakes: order items



Amy's Cupcakes – Order items



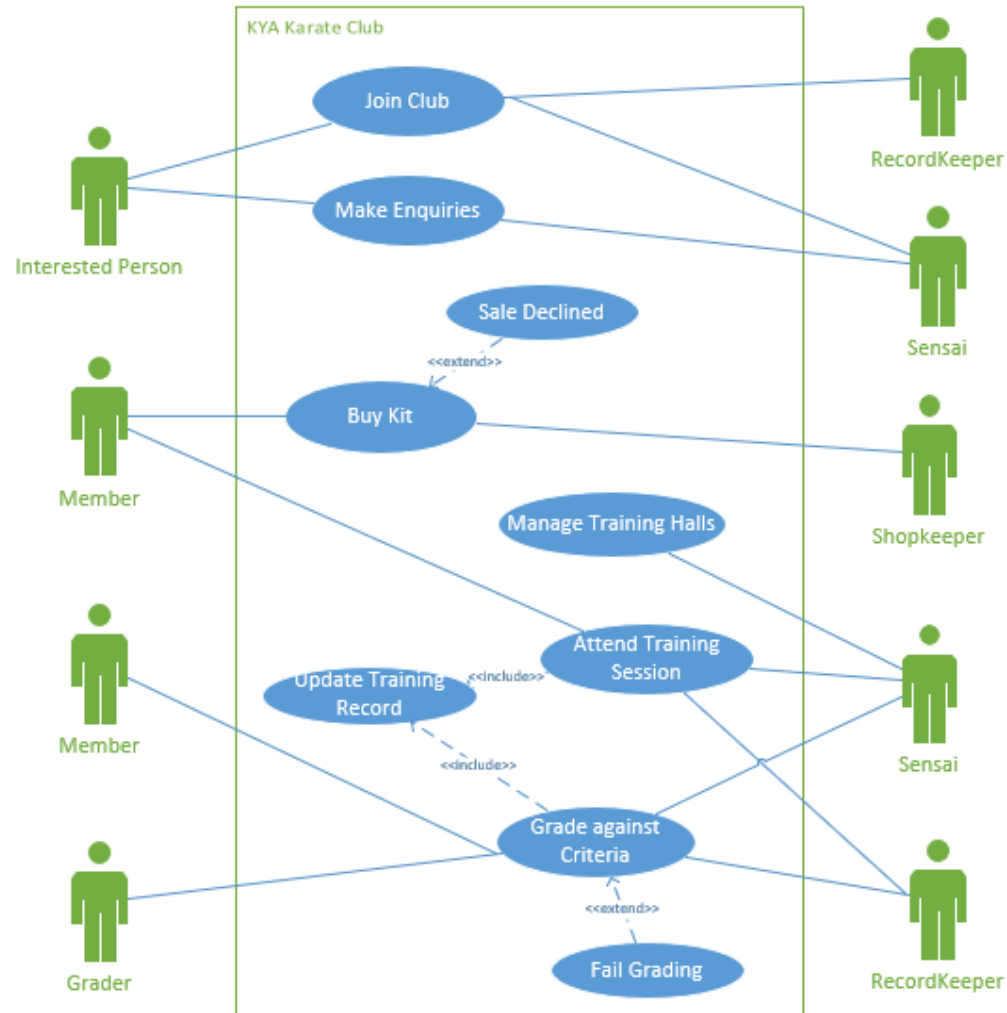
Continual Refinement...



During the creation of the activity diagrams, it became apparent that I had missed some functionality off my original use case diagram.

Can anyone guess what it is?

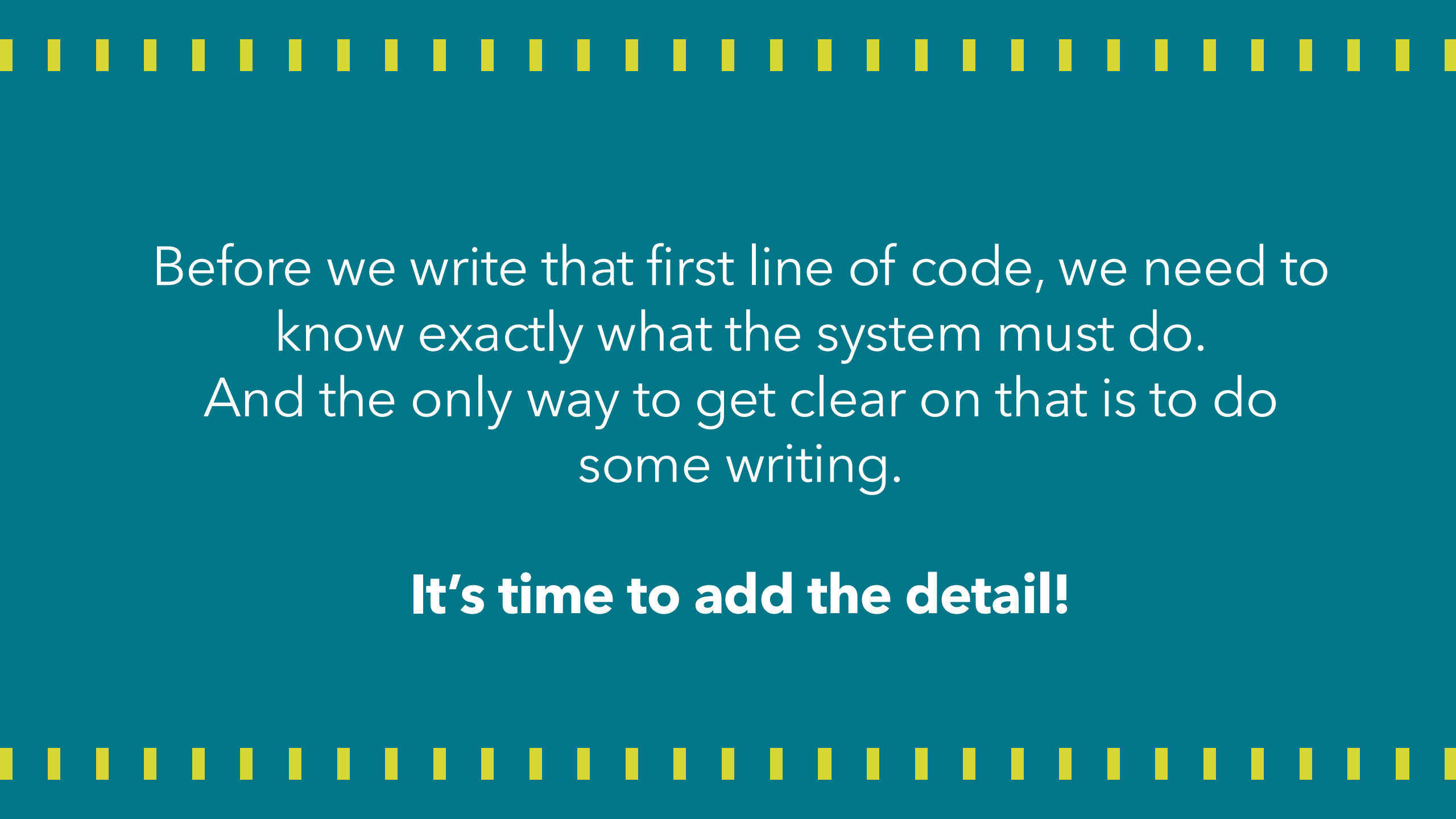
Continual Refinement...



- Answer: My diagram doesn't show the booking of the halls for the sessions.
- As I have termed the **Attend Training session** in terms of the member this doesn't account for this process.
- If the use case had been in terms of the Sensei, as in **Run Training Session**, this functionality could have been in this use case.
- We could have another use case called **Book Halls**, or **Manage Training Halls**, which is an end goal of the Sensei.

Diagrams Are a Good Start... but...

- Should we stop here?
- Do they give us enough detail?
- Is there enough detail to now go on and start programming?



Before we write that first line of code, we need to
know exactly what the system must do.
And the only way to get clear on that is to do
some writing.

It's time to add the detail!

Textual Descriptions

AKA Use Case descriptions

A description of the interaction between the user and the system

Step-by-Step breakdown

Describe the 'what' - not the 'how' - no technical details

**Just like Activity Diagrams, Textual Descriptions are essentially a story.
A story of how an actor uses the system to achieve some end-result.**

What to Include in a Textual Description...

- **Name (Title) of use case**
- **Pre-conditions**
- **Post-conditions**
- **Purpose**
- **Steps of the success story**
- **Alternate paths (& failures)**

Use Case Name	
Description	
Actors	
Pre-conditions	
Post-conditions	
Main Success Scenario	
Alternate Paths	

This is not a rigid format, but it needs to be structured to be readable

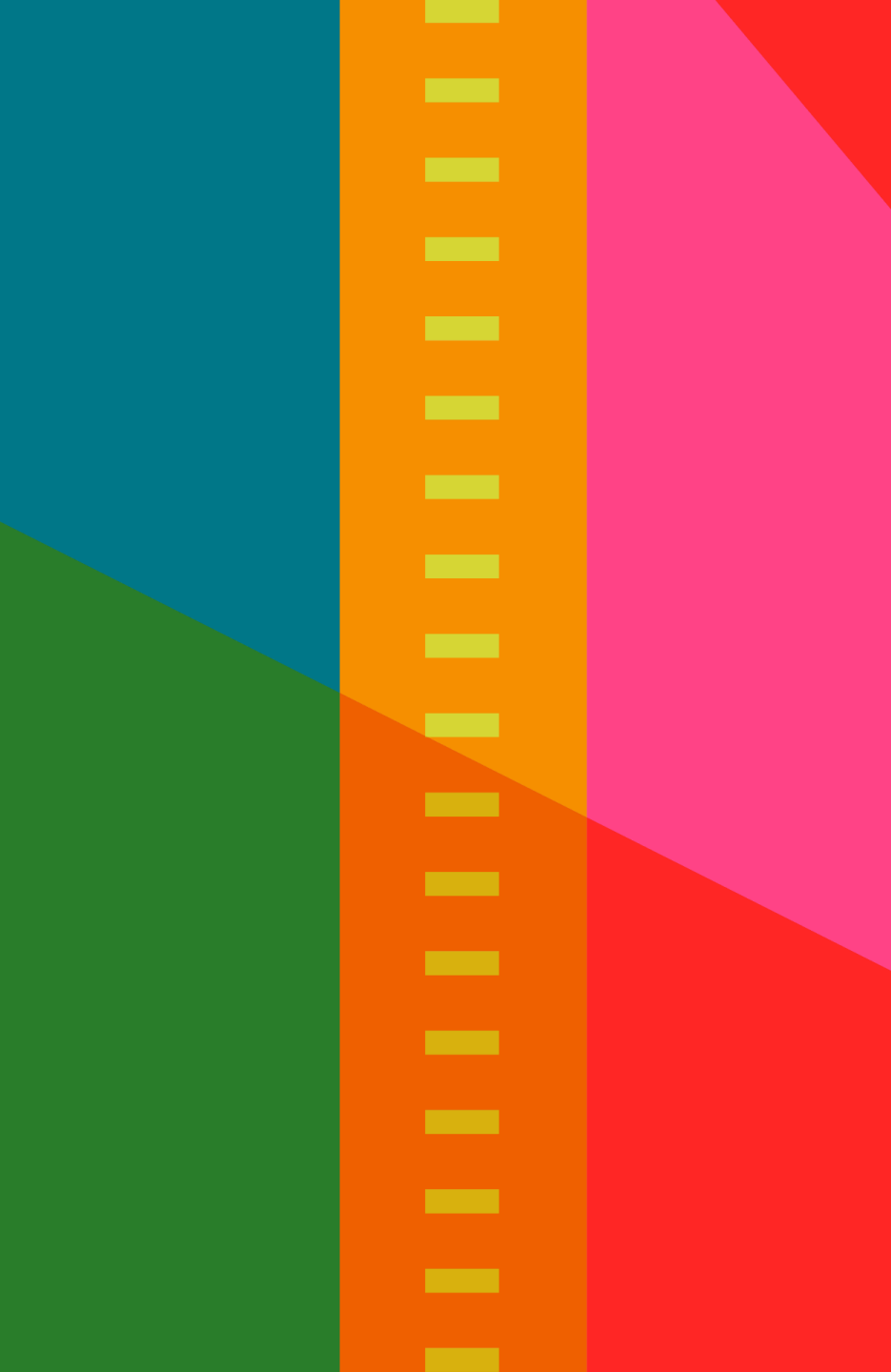
Style Guides

There are lots of different ways to write a use case description.

However, the most important point is to write clearly... a use case that is difficult to understand is useless.

Regardless of the format a use case has a beginning, a plot, and a clear ending – just like a story!





Beginning

An event initiated by an actor...

First step in the use case...

"The use case begins when the [actor] does [something]"

Ending

A good use case has a purpose. It delivers some result to one or more of its actors and then it ends...

Last step in the use case...

"The use case ends when [something]"



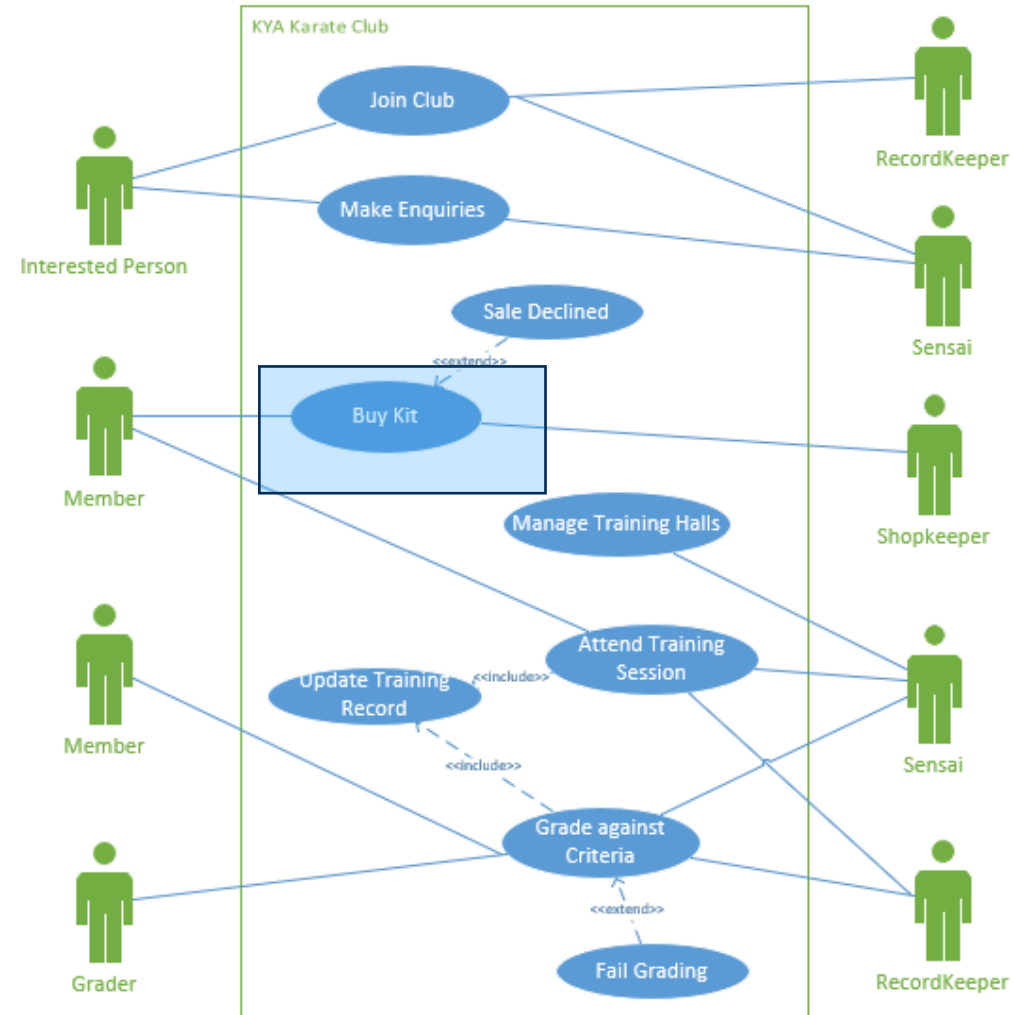
Use Case Sentence Style

- **A sentence in the present tense**
- **With an active verb in the active voice**
- **Describing an actor successfully achieving a goal that moves the process forward**

Some examples:

- Customer enters card and PIN
- System validates that customer is authorized and has sufficient funds
- Shopkeeper generates and gives the Customer a receipt.

Describing the Buy Kit Use Case



Describing the Buy Kit Use Case

Buy Kit

Header Section

- Use case:** Buy Kit
- Actors:** Member (initiator), Shopkeeper
- Purpose:** Capture a sale and its payment
- Pre-requisite:** Member wants to buy something, must be a Member
- Post-requisite:** Purchase has been made and recorded

Main Success Scenario

Buy Kit

1. Use case begins when Member arrives at POS with items to buy.
2. The Shopkeeper records the details of items sold in the ledger.
3. The Shopkeeper calculates and tells the member the sales total.
4. The Member gives a cash payment for the full amount.
5. The Shopkeeper generates and gives the member a receipt.
6. Use case ends when the Member leaves with the items purchased.

Alternative Path Examples

Buy Kit

3a. Member declines purchase

4ai. Member pays the amount owed with credit card

ii. Card service authorises payment

4bi. Member gives cash payment larger than sales total

ii. Shopkeeper gives change

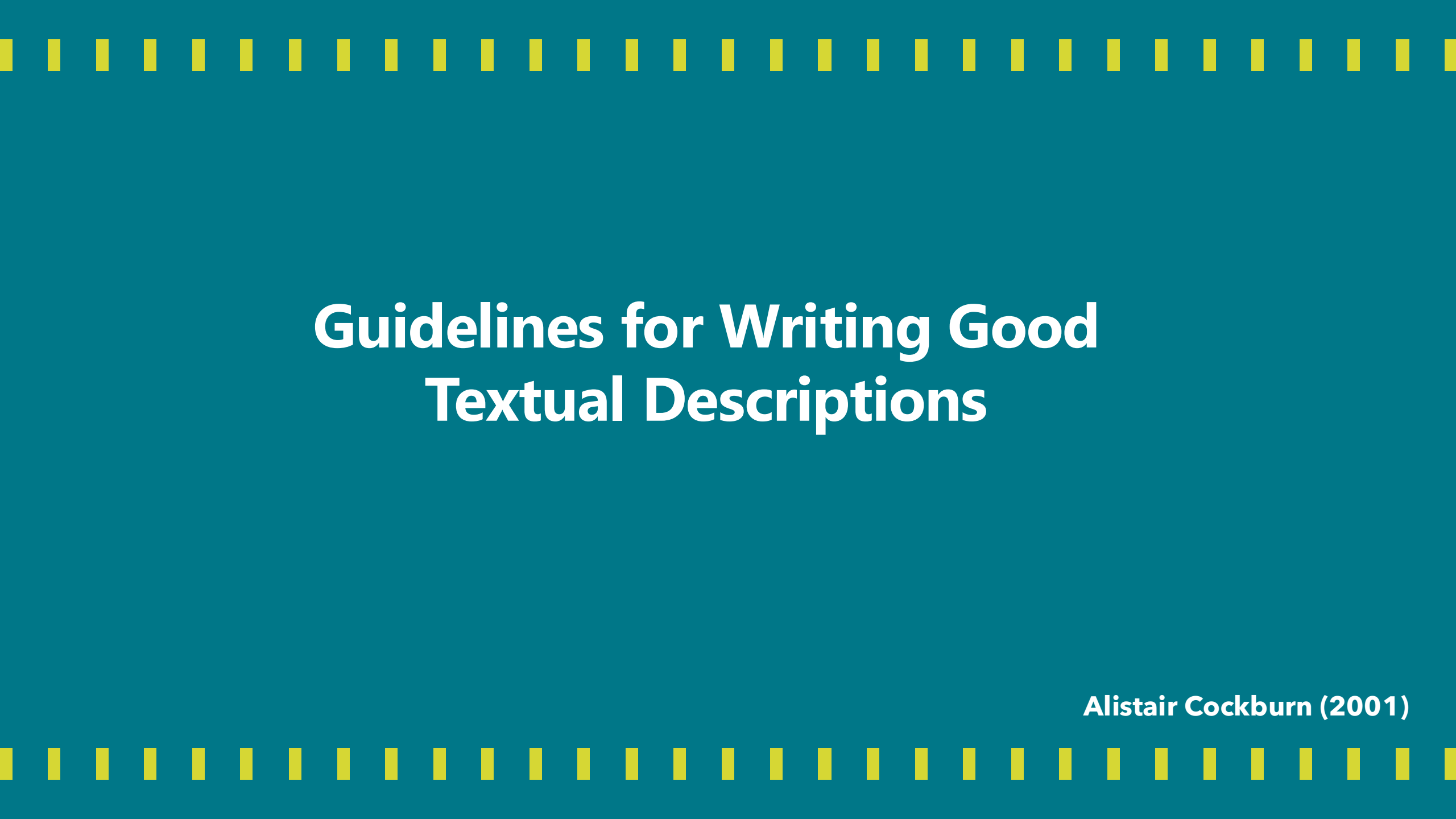
There are more we could describe ...

Buy Kit Use Case



Buy Kit

Use Case Name	Buy Kit
Description	To capture a sale and its payment
Actors	Member (initiator), Shopkeeper
Pre-conditions	Member wants to buy something. Must be a member.
Post-conditions	A purchase has been made and recorded.
Main Success Scenario	1. Use case begins when Member arrives at POS with item to buy. 2. The Shopkeeper records the details of items sold in the ledger. 3. The Shopkeeper calculates and tells the Member the sales total. 4. The Member gives a cash payment. 5. The Shopkeeper generates and gives the Member a receipt. 6. The use case ends when the Member leaves with the items purchased.
Alternate Paths	3a. Member declines purchase. 4ai. Member pays with card. ii. Card service authorises payment. 4bi. Member gives cash payment larger than sales total. ii. Shopkeeper gives change.



Guidelines for Writing Good Textual Descriptions

Alistair Cockburn (2001)

Guideline 1: Use Simple Grammar

Subject

- The Shopkeeper
- The Member

Verb

- Deducts
- Pays
- Records

Direct Object

- The amount
- The transaction

Prepositional Phrase

- From the account
- In the ledger

Guideline 2: Show “Who has the Ball”



At each step, an Actor needs to be in control

“The ball” is control of the message/data

Like a football match...

Actor1 has the ball, dribbles it, kicks it to Actor2. Actor2 passes to Actor3, etc

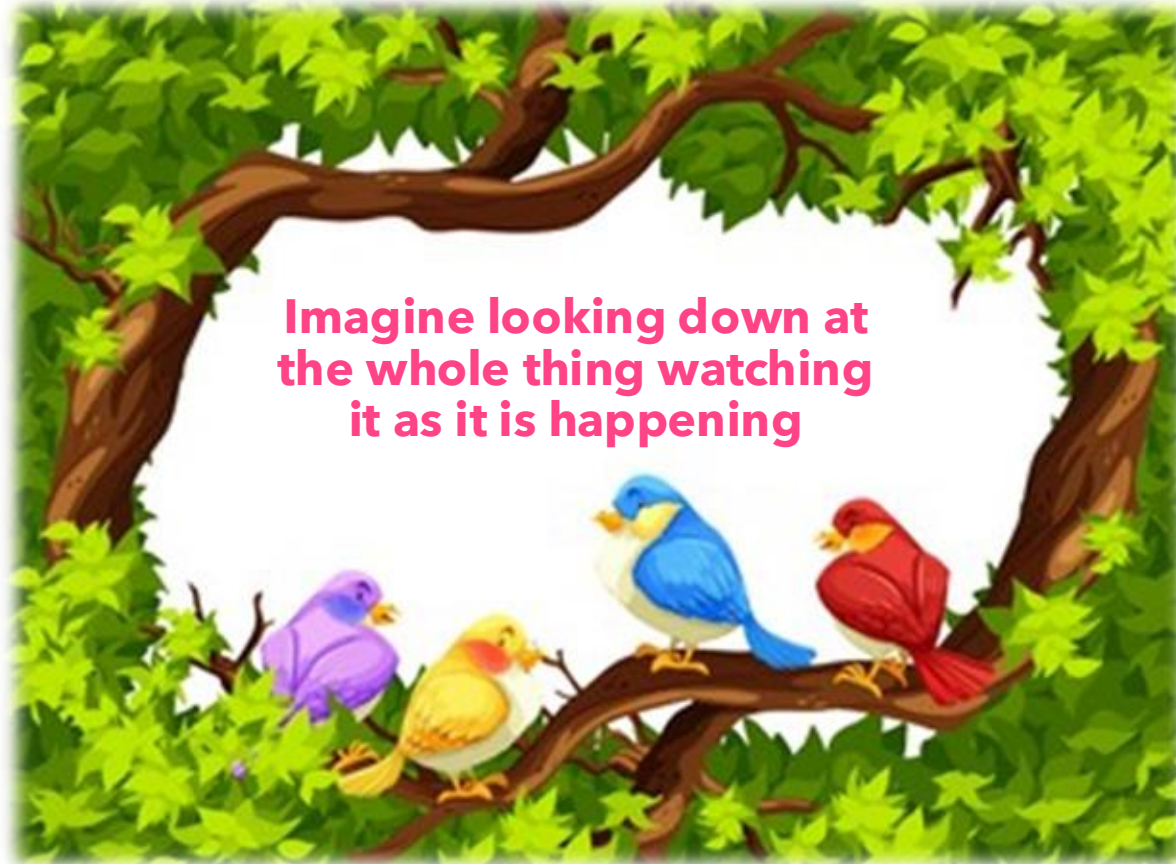
Or in the form of a play...

...announcing who is about to act

Check each sentence to make sure it is clear who owns the actions in each step



Guideline 3: Takes a Bird's Eye View



Example:

The Customer puts in the ATM card and PIN

NOT

Get ATM card and PIN

The System deducts the amount from the account balance

NOT

Deduct the amount from the account balance

The Shopkeeper records the transaction in the ledger

NOT

The transaction is recorded in the ledger

Guideline 4: Show Progress

Don't make steps too small

- User enters name
- User hits tab key

...to get to the address field

Because they have to enter name and address before the system progresses to the next step

Should have about 7-12 steps

Much better: User enters name and address

Guideline 5: Show Actor's Intent

Show the intent of the actor, not their movements in accomplishing the intent

Wrong Way

1. System asks for name
2. User enters name
3. System prompts for address
4. User enters address
5. User clicks ok
6. System presents user's profile

Right Way

1. User enters name and address
2. System presents user's profile

Guideline 6: Include 'Reasonable' Set of Actions

The customer enters the order number. The system detects that it matches the winning number of the month, registers the user and order number as this month's winner, sends an email to the sales manager, congratulates the customer and gives them instructions on how to claim their prize

This is difficult to read and understand

Guideline 7: Validate – Don't Check

Go for the Success Scenario first

Wrong way:

The System **checks** whether the password is correct

If it is, the System presents the user's profile

If it isn't??

Then what?

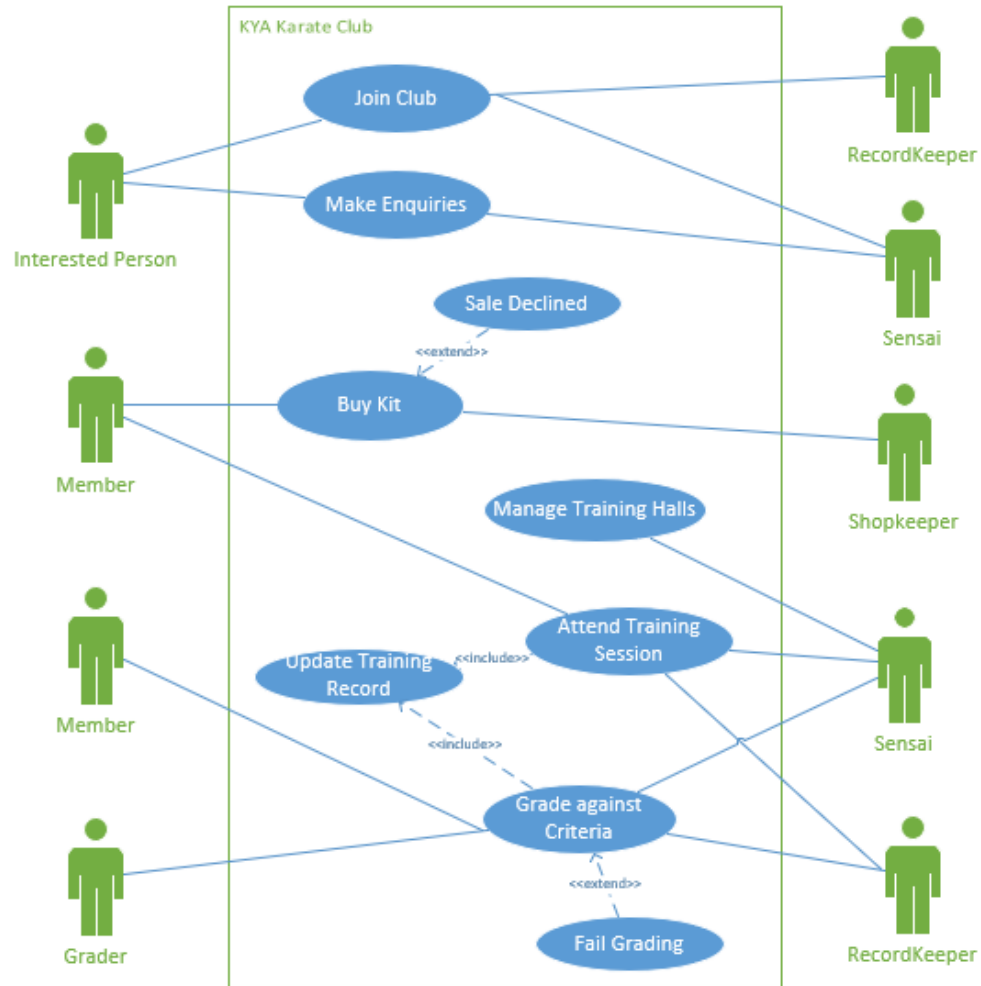
Right way:

The System **validates** that the password is correct

The System presents the user's profile

(alternatives are shown in the alternative paths section)

Another example...



Use Case Name	Attend Training Session
Description	To partake in a training session
Actors	Member (initiator), Interested Person, Sensei, Record Keeper
Pre-conditions	Member / Interested Person wants to attend a training session.
Post-conditions	Member has attended a training session. Membership card has been stamped. Attendance record has been updated.
Main Success Scenario	1. Use case begins when Member or Interested Person arrives at the training hall. 2. The Record Keeper verifies the person is a member. 3. Member gives Record Keeper payment for session and their membership card. 4. Record Keeper stamps the membership card with today's date and gives back to Member. 5. Record Keeper dates the Member's record. 6. Sensei conducts training session. 7. The use case ends when the Member / Interested Person leaves the training hall.
Alternate Paths	3a. The person is not a Member (wants a free session). 3ai. The Interested Person completes personal details / health questionnaire. 3aii. The Record Keeper verifies that the Interested Person is of sufficient fitness to take training. Rejoin at No. 6.

Writing good use cases (or any other requirements) requires thinking, communicating, and thinking again.

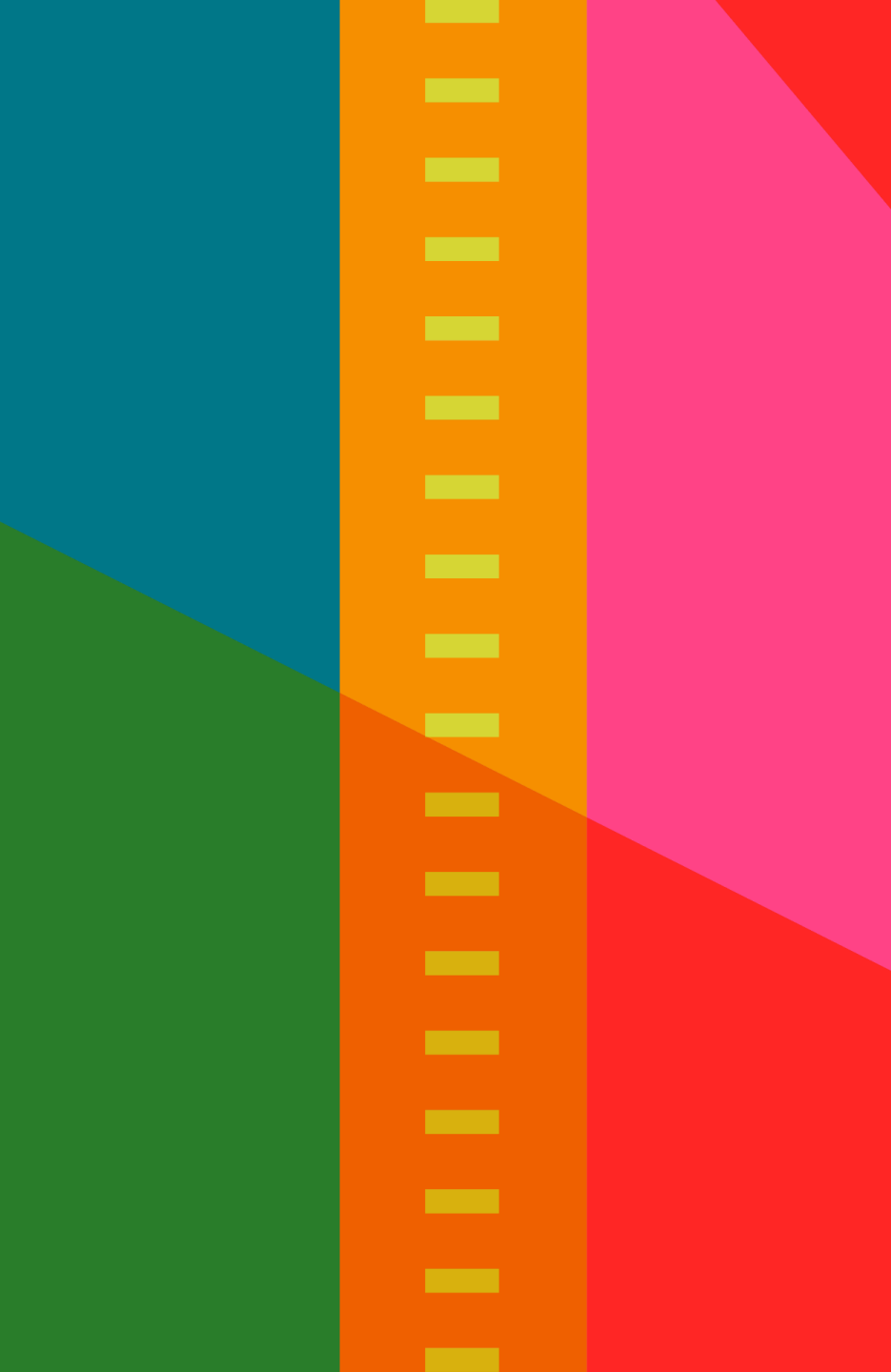
If you don't want to think, find a new profession. Software development requires thinking, at all levels.

Alistair Cockburn (2010)

A decorative footer consisting of several overlapping geometric shapes in various colors: green, cyan, magenta, orange, and yellow.

Further Reading

- Cockburn (2001). Writing Effective Use Cases. Addison Wesley. (Available from: <https://www-public.imtbs-tsp.eu/~gibson/Teaching/Teaching-ReadingMaterial/Cockburn00.pdf>)
- Bittner and Spence (2003). Use Case Modeling. Addison Wesley.
- Bennett, McRobb and Farmer (2006). Object-Oriented Systems Analysis and Design. McGraw Hill.
- Jacobson, Spence, Kerr (2016). Use-Case 2.0. The Hub of Software Development



Assessment Reminder

Exam (50%):

- Takes place in May during one of the exam weeks
- Will include everything we have covered across the year

Coursework (50%):

- Will be released next week (27th Nov)
- Will include everything we have covered in Semester 1

Any Questions?