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INTERNATIONAL FORUM ON SKILLS INTELLIGENCE, 2025

Leveraging Generative AI with Semantic Searching to build Custom Skills Frameworks

Skills intelligence for Career Guidance & Student Support

Aljaž Leben, Kamarul Adha

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skilldata.info

Projects

- Quality standards and skill frameworks
- Building personalised career guidance platforms

LCAMP
Learner Centric Advanced Manufacturing Platform

QualityLink

RALExILA
NATIONAL REGISTERS OF ADULT LEARNING
TO SUPPORT THE IMPLEMENTATION
OF INDIVIDUAL LEARNING ACCOUNTS

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LET'S TALK SKILLS

JOB SEEKERS

Skills indicate prior experience and learning achievements.

EDUCATION PROVIDERS

Skills describe learning outcomes of learning opportunities.

EMPLOYERS

Skill describe required competences for occupations.

Skills based language can help identify educational pathways.

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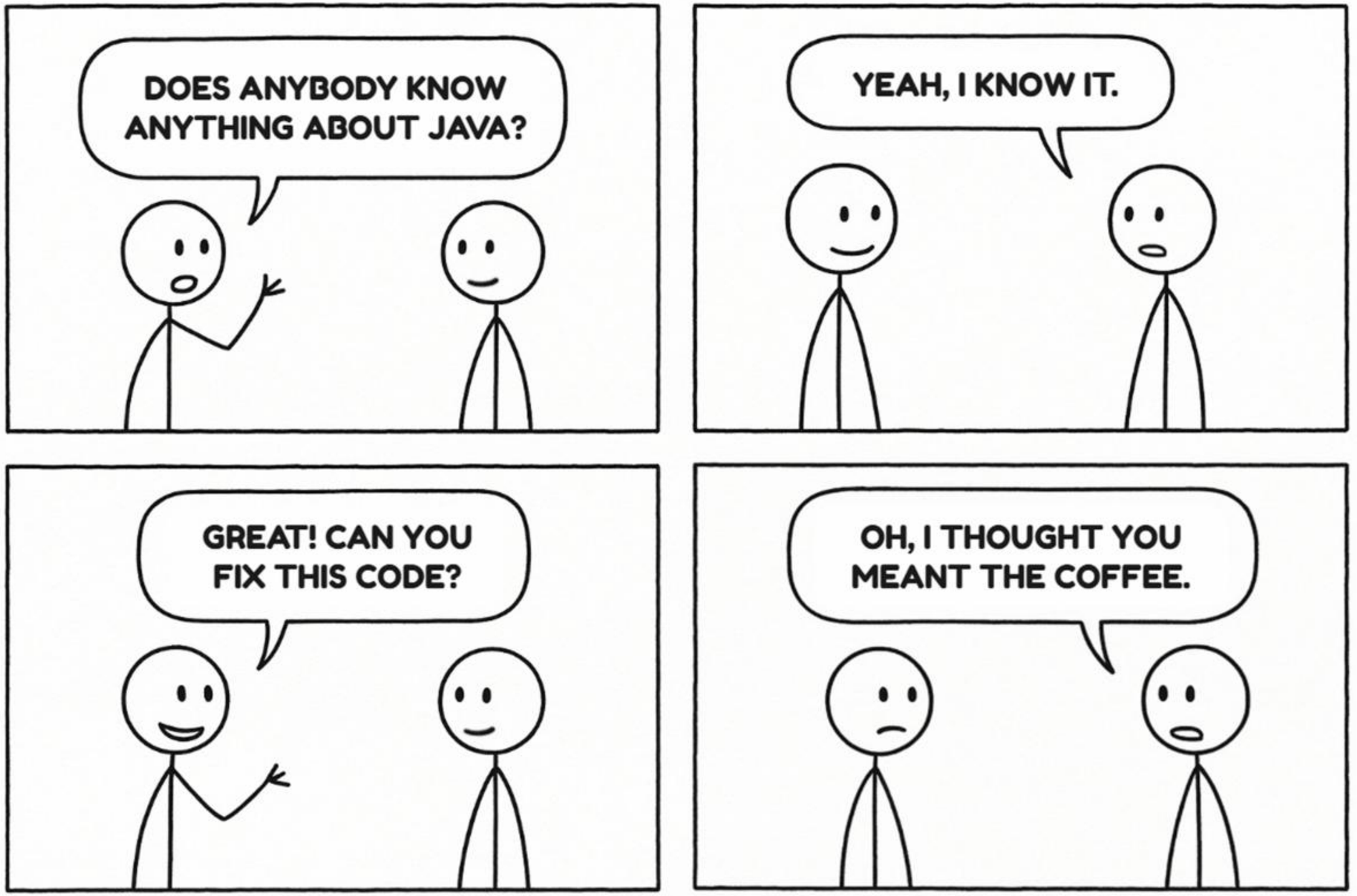
THE PROBLEM



https://knowledgeinnovation.eu/

Examples of Skill Frameworks & Standars

ESCO

European Skills, Competences, Qualifications and Occupations

DigComp

The Digital Competence Framework

GreenComp

the European sustainability competence framework

SFIA

Skills Framework for the Information Age

SkillFuture

Skills Frameworks to support the Industry Transformation Maps

RSD

Rick Skill Descriptors Schema

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THE SECRET SAUCE

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SEMANTIC SEARCH

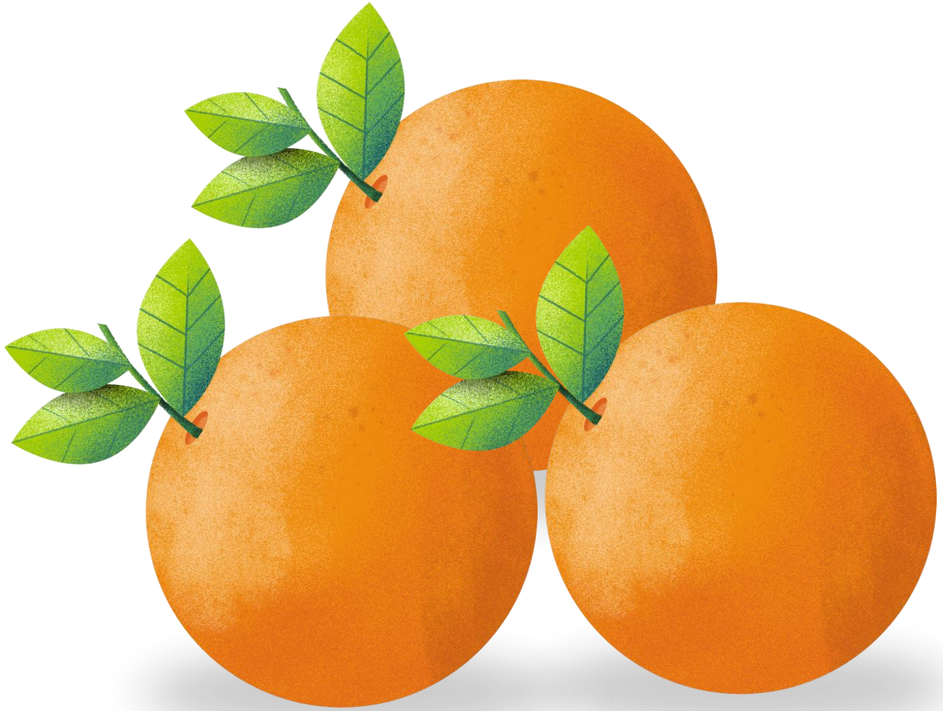
Step-by-Step with Kamarul Adha

The what

The how

The why

How can we train an AI to recognise between *Apples* & *Oranges*?



What if we extract features?

What if we extract features?

Level of ***Sweetness***

&

Level of ***Crunchiness***

Level of Sweetness (S)

0.0 Not Sweet

0.5 Somewhat Sweet

1.0 Extremely Sweet

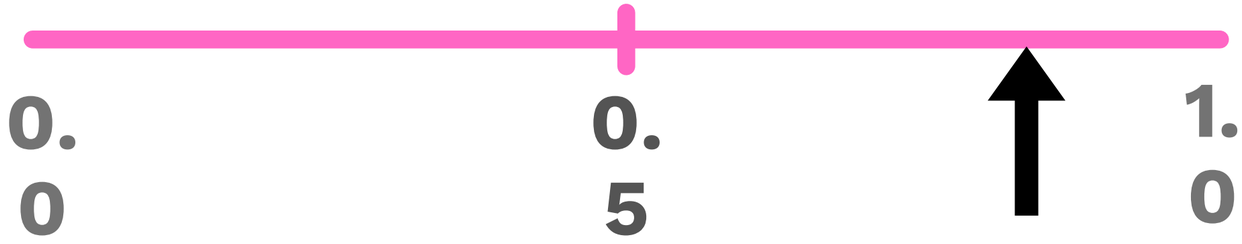
Level of Crunchiness (C)

0.0 Not Crunchy

0.5 Somewhat Crunchy

1.0 Extremely Crunchy

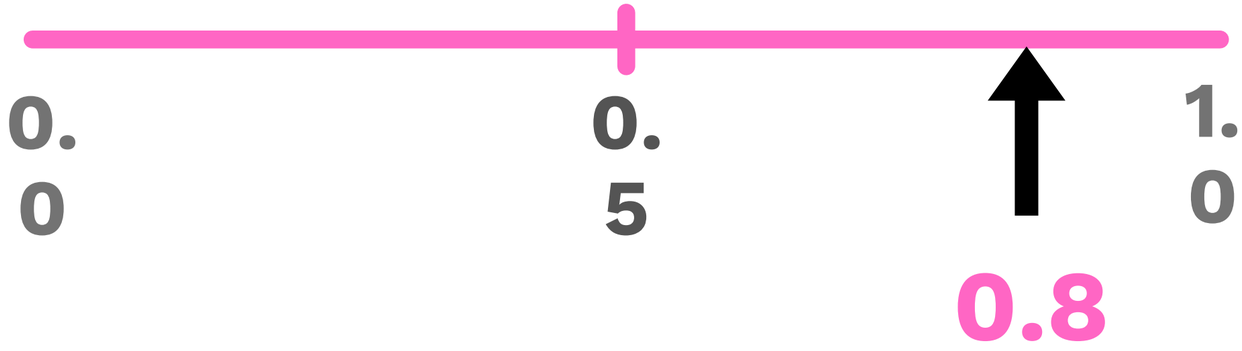
Level of Sweetness (S)



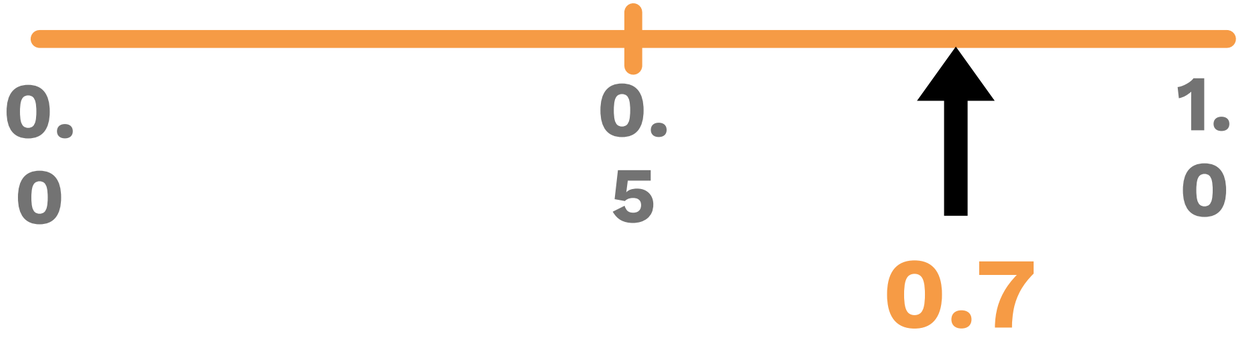
0.8

Level of Crunchiness (C)

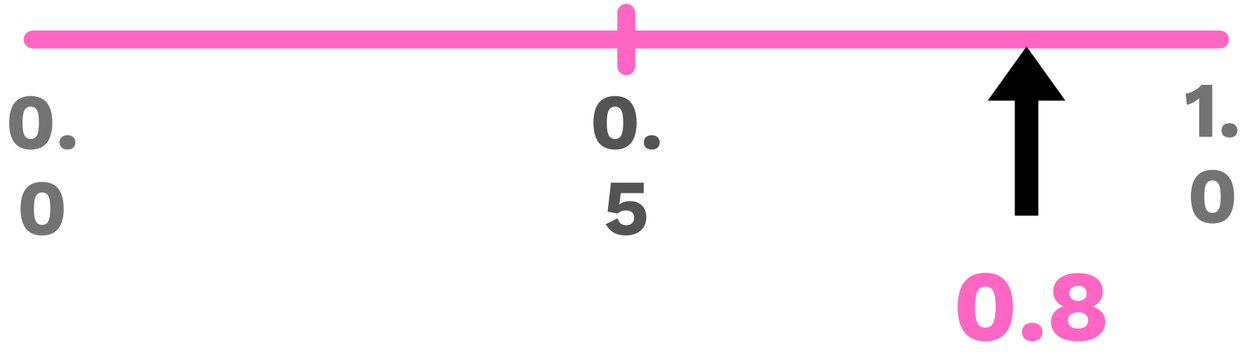
Level of Sweetness (S)



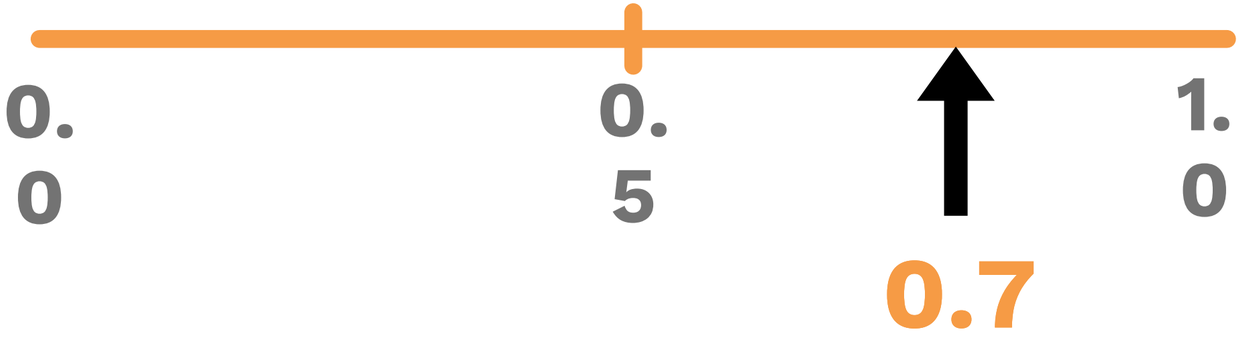
Level of Crunchiness (C)



Level of Sweetness (S)



Level of Crunchiness (C)



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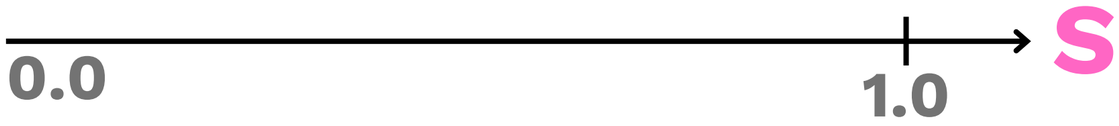

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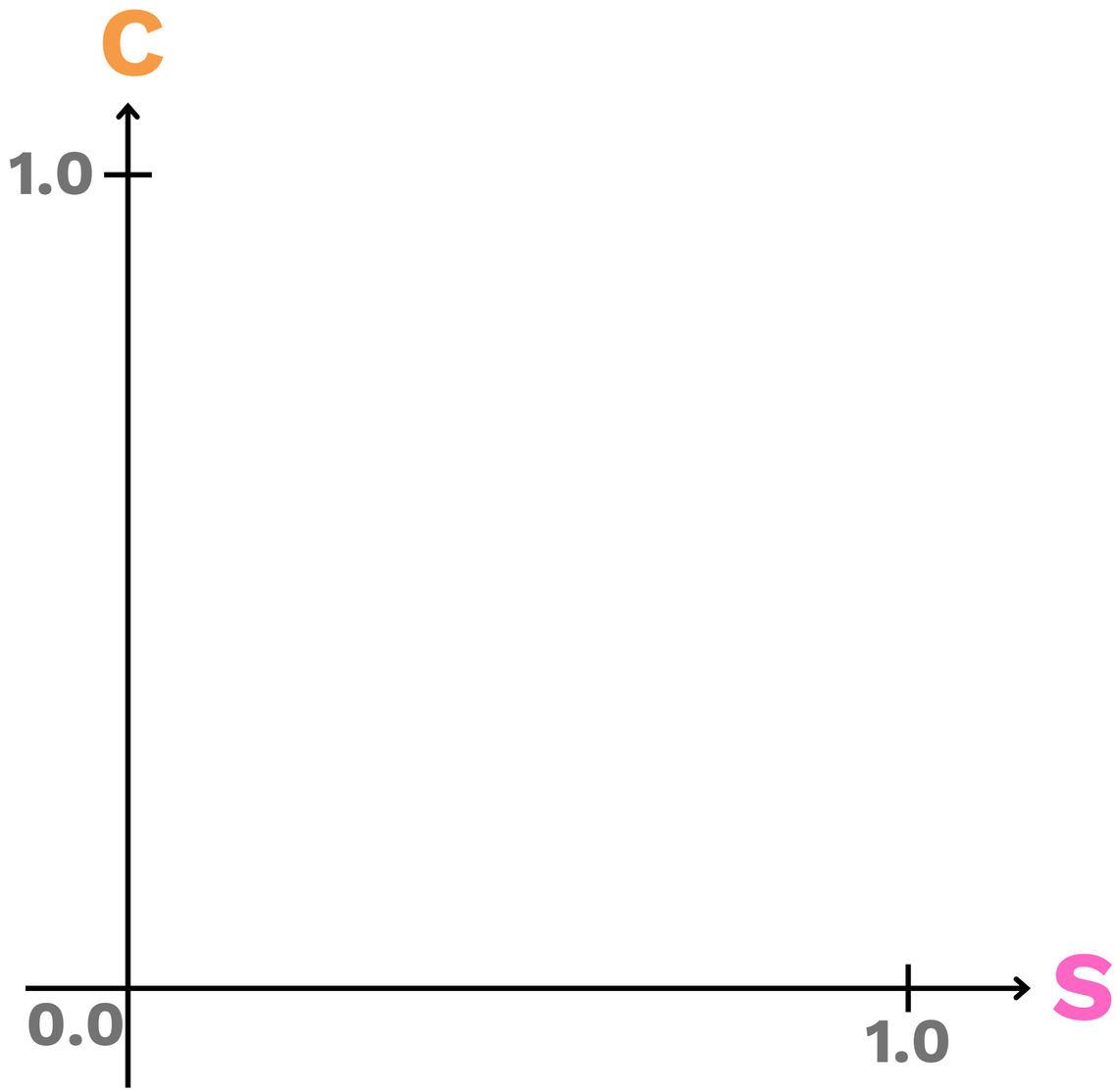

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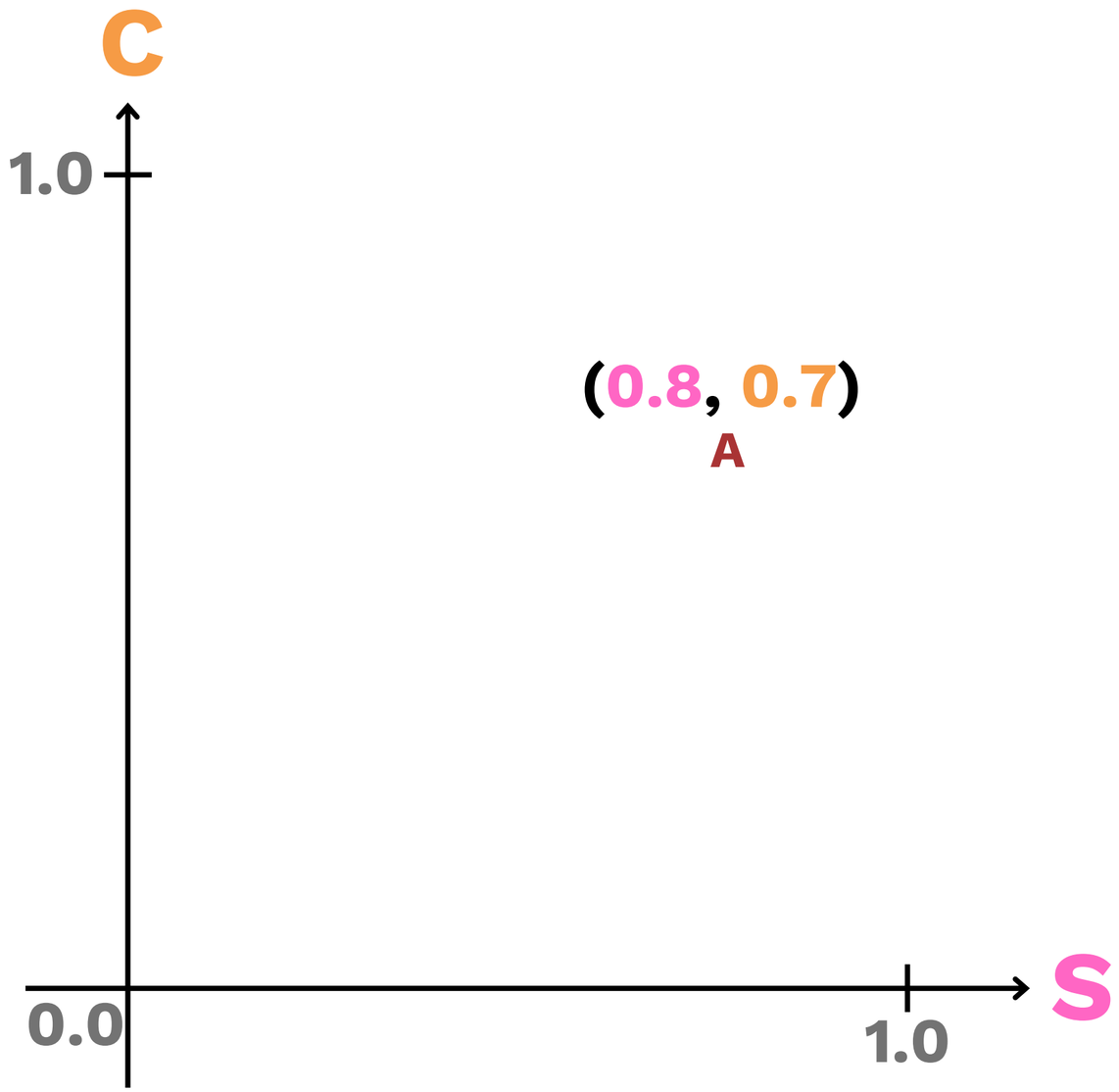

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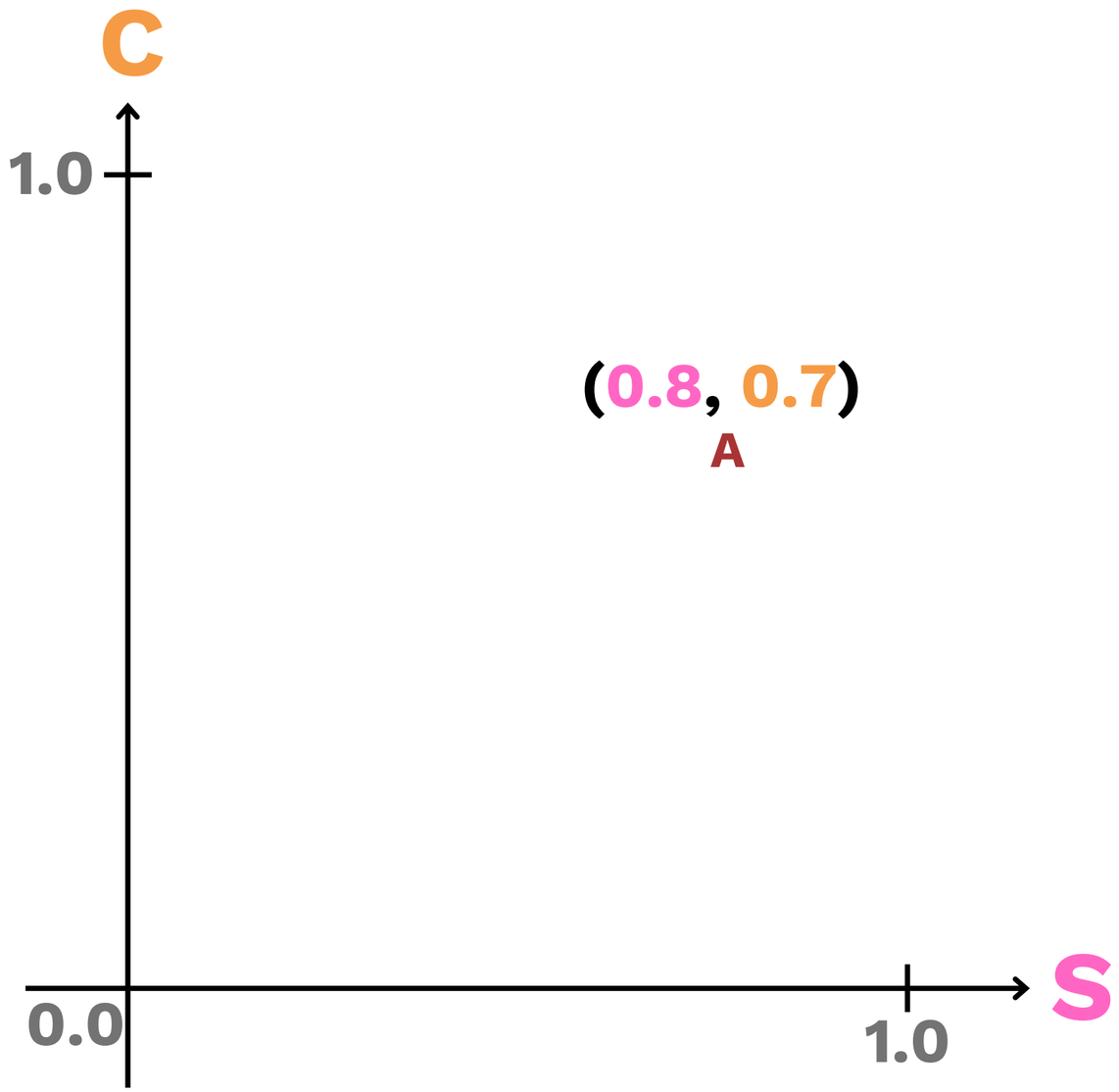

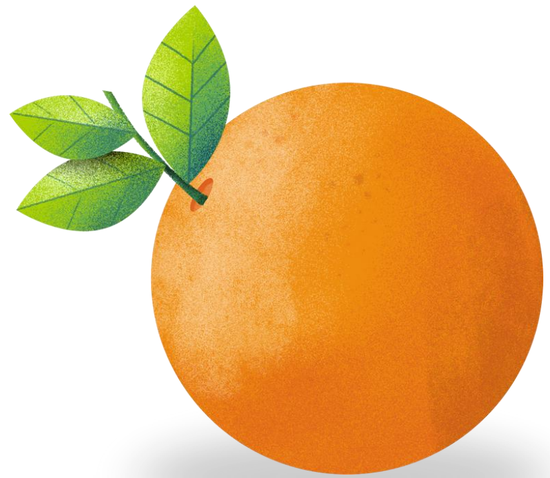

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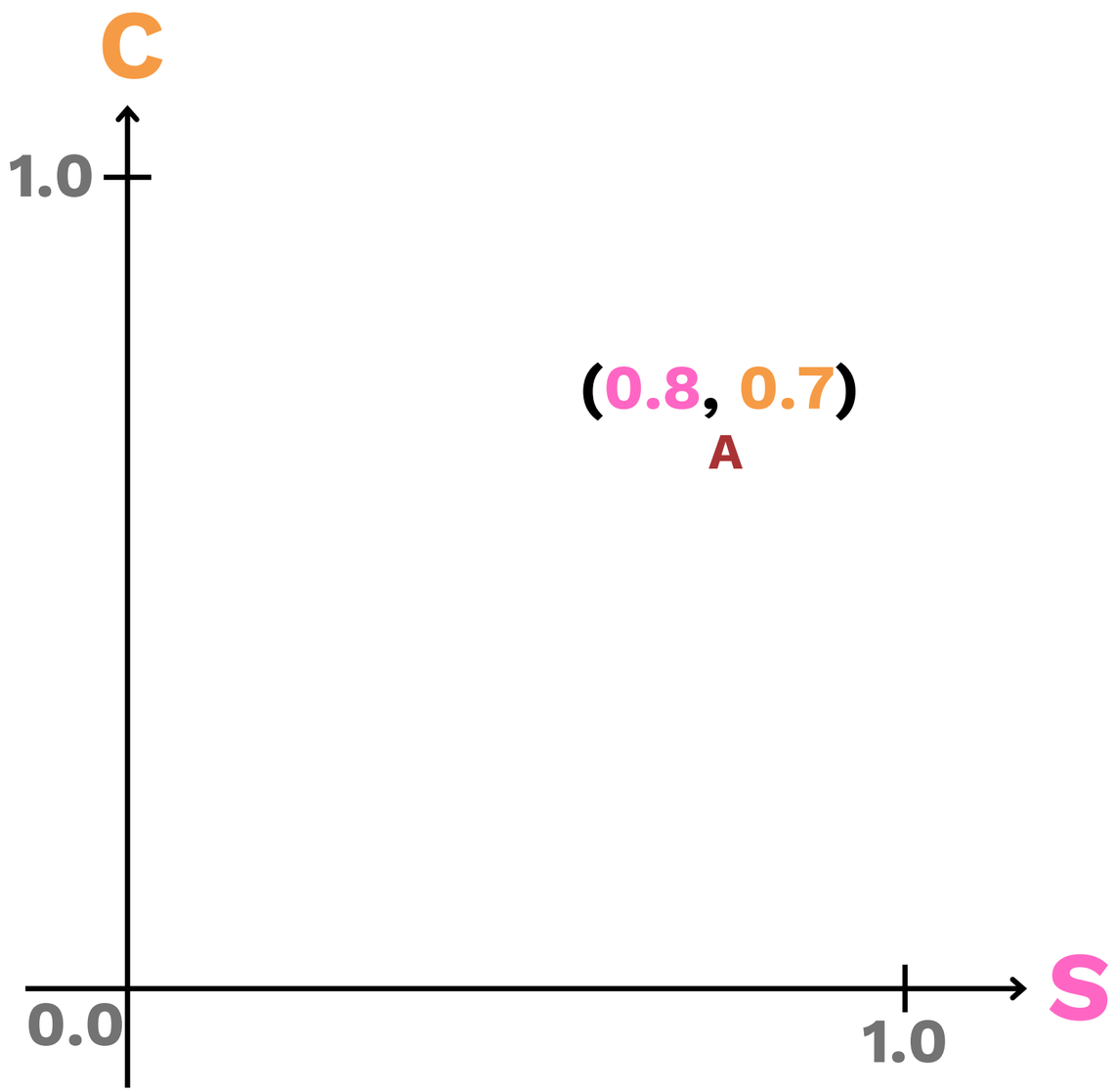
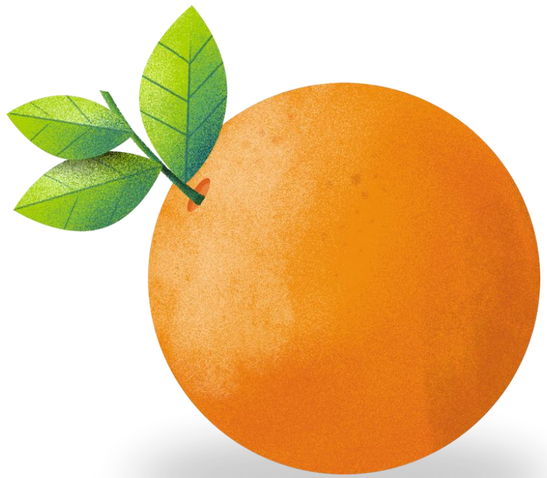
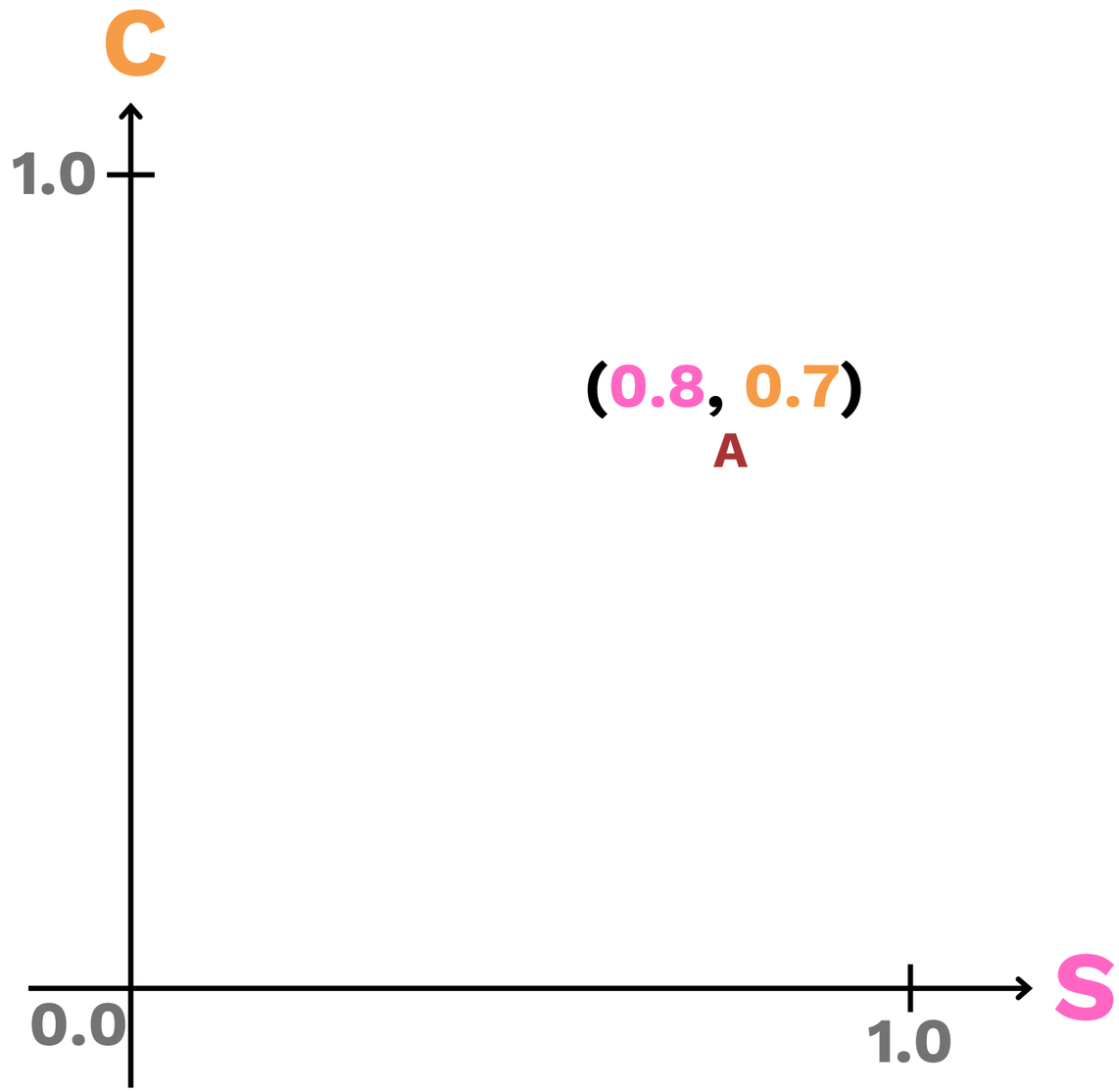
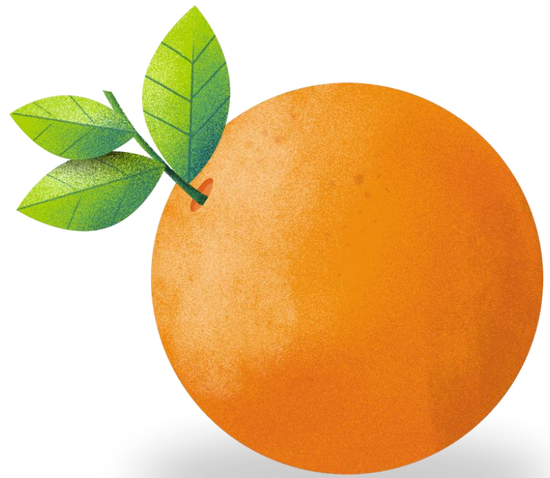


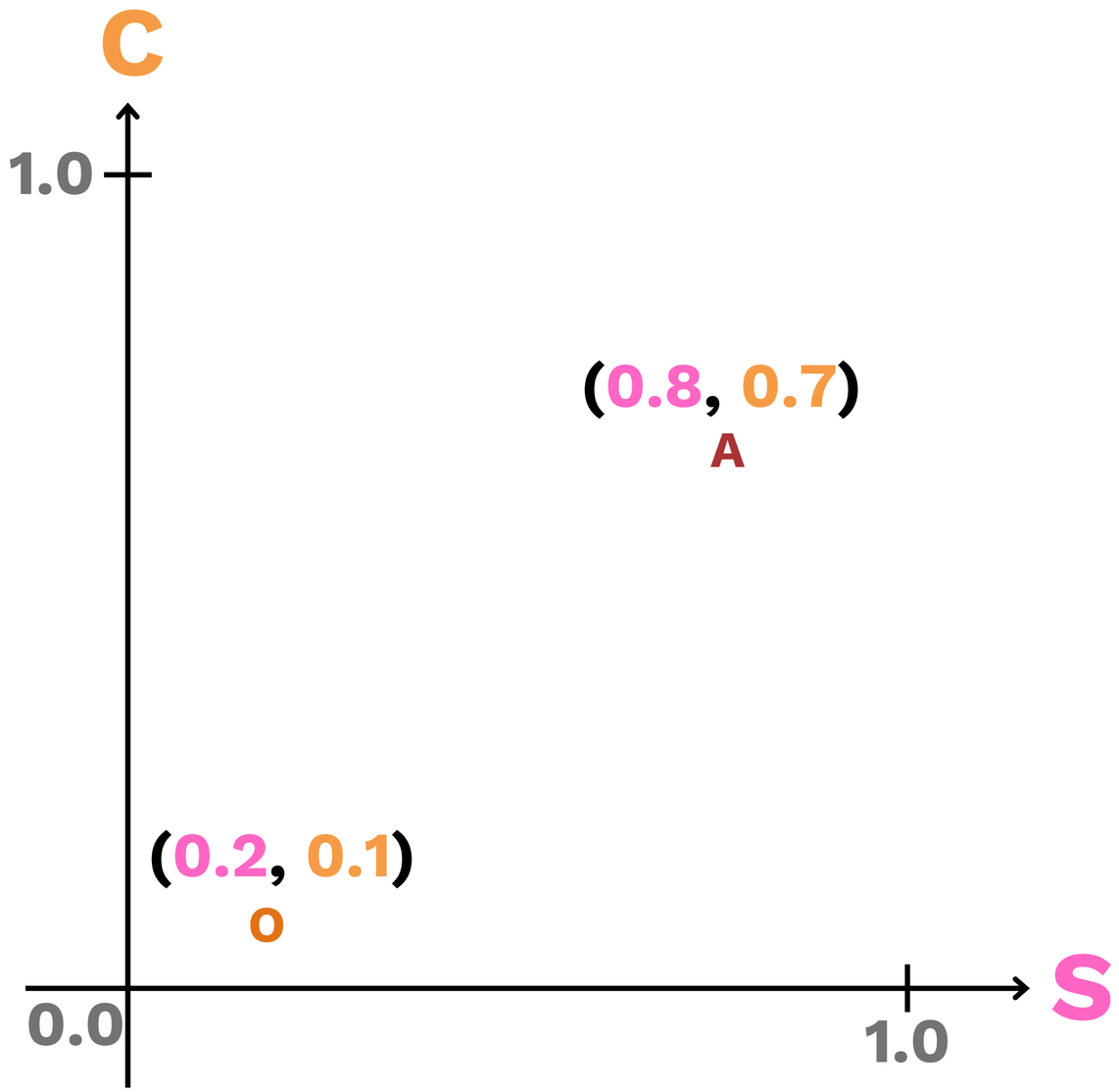
(0.8, 0.7)
A

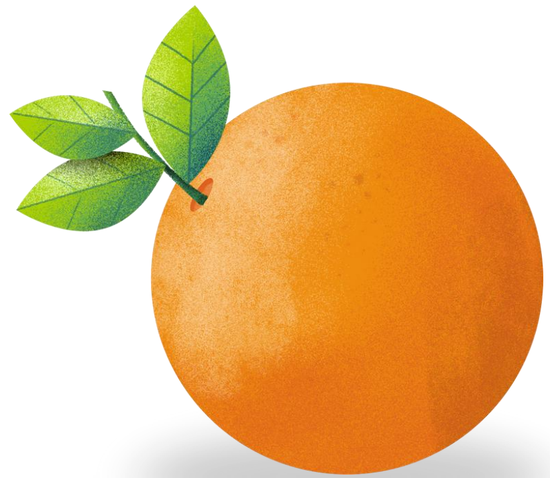






(S, C) = (0.2, 0.1)





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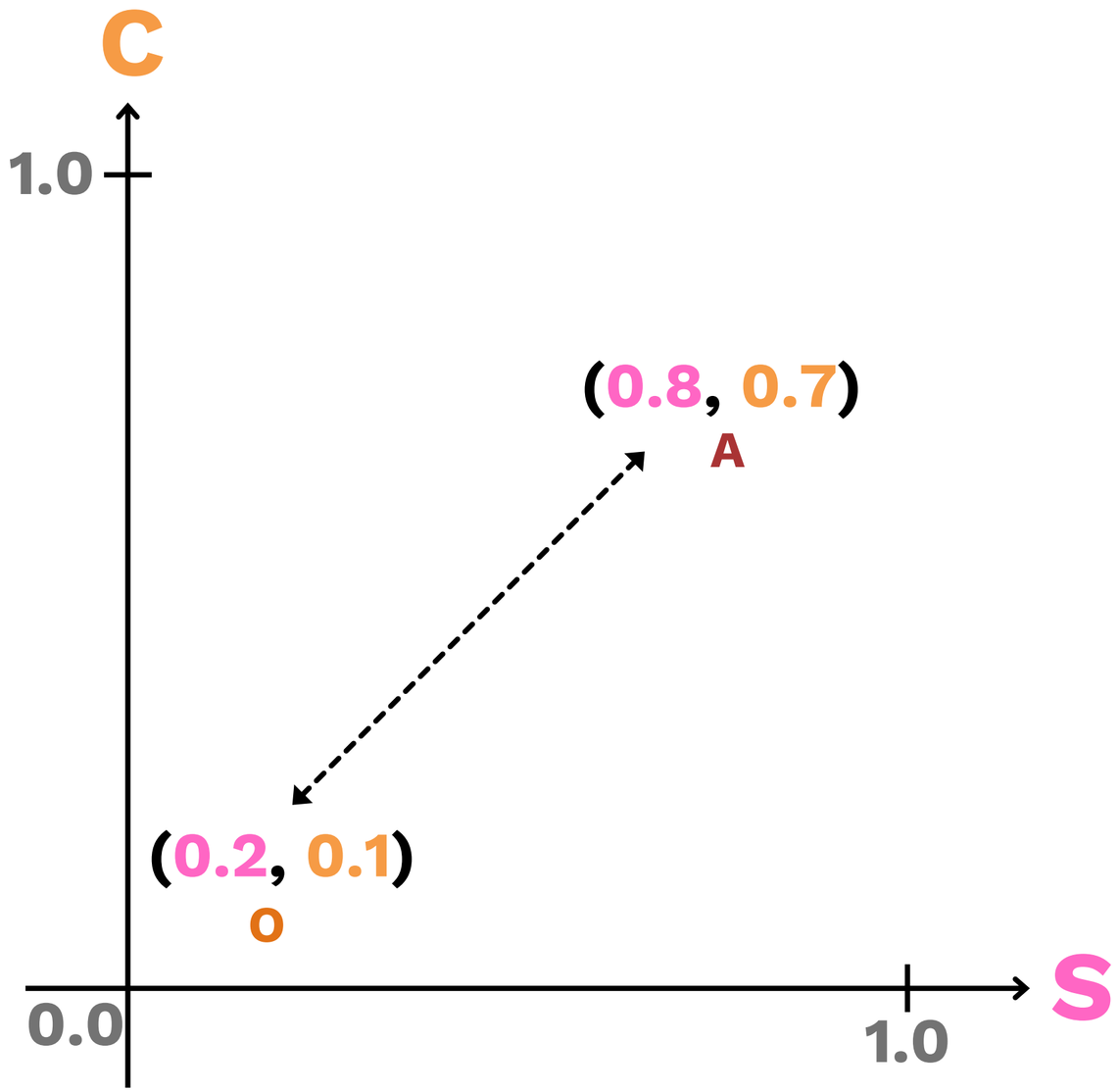

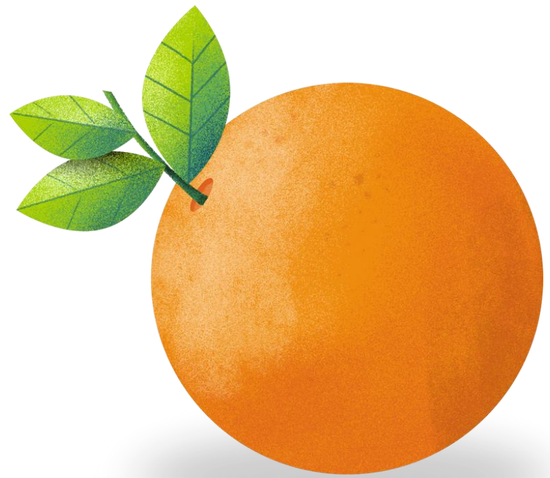

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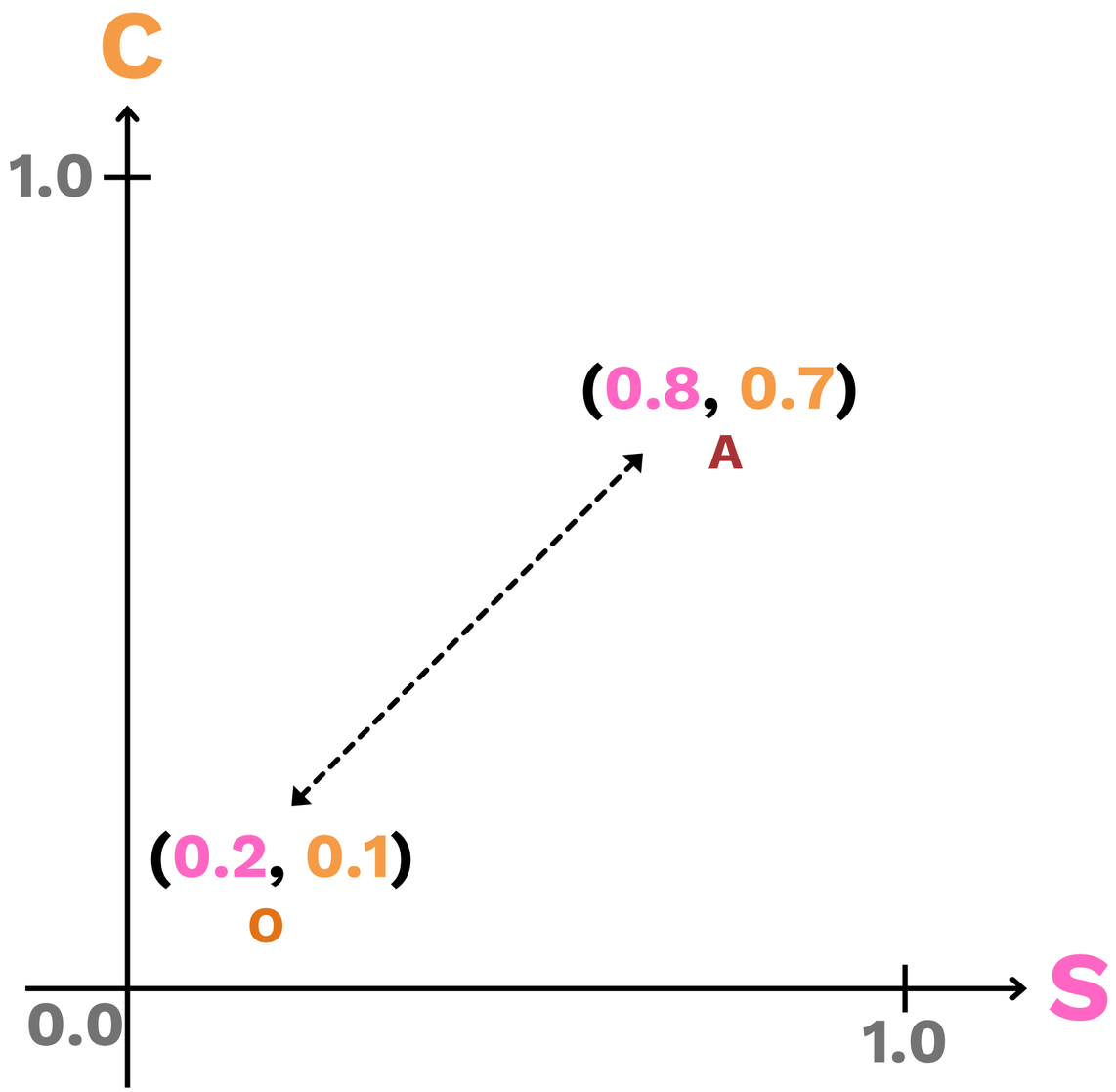
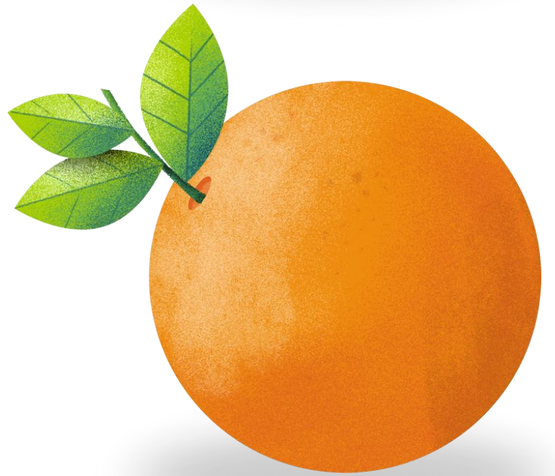
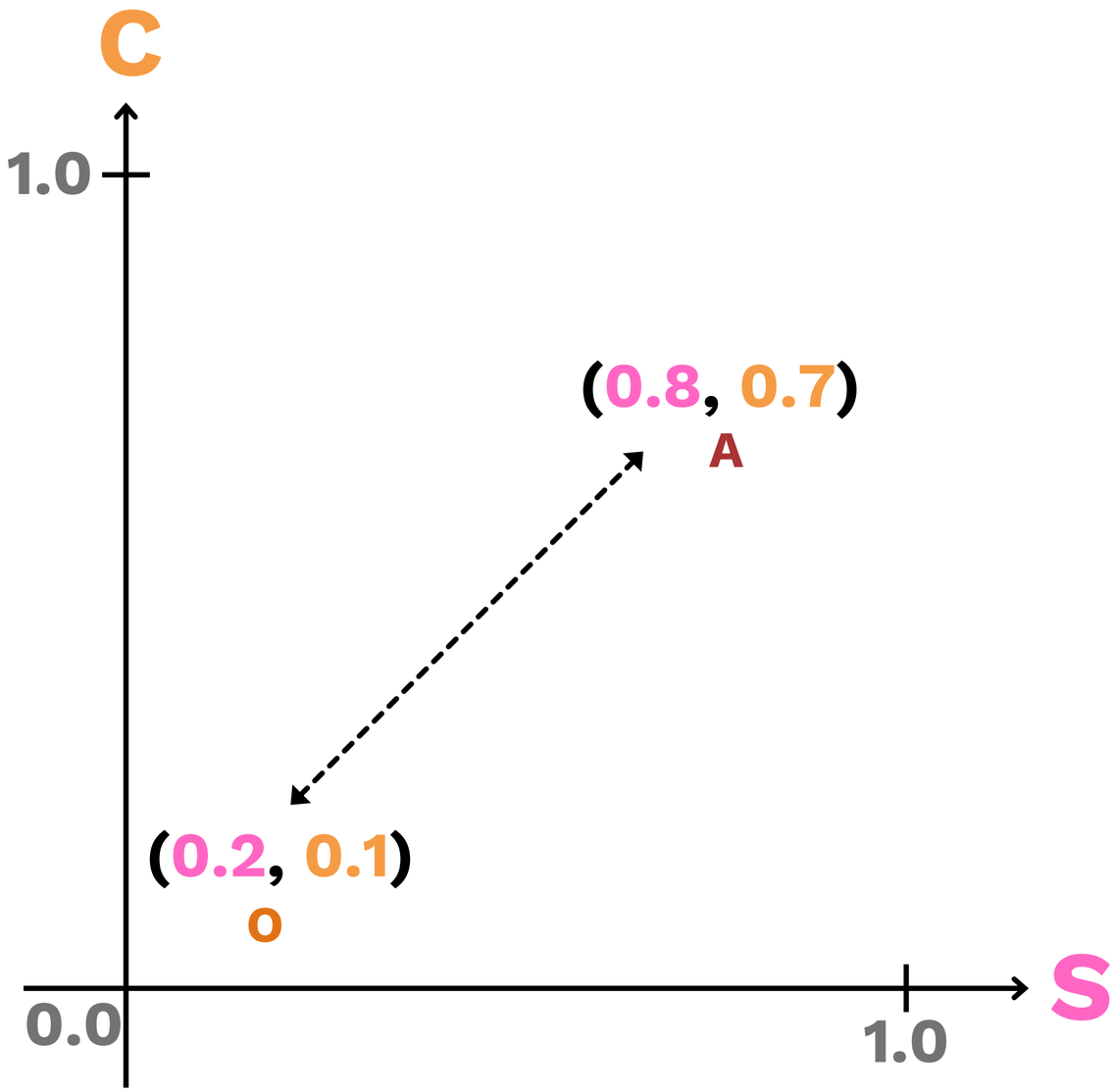

C
1.0
(0.8, 0.7)
A
(0.2, 0.1)
O
0.0
1.0
S




C
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(0.8, 0.7)
A
(0.2, 0.1)
O
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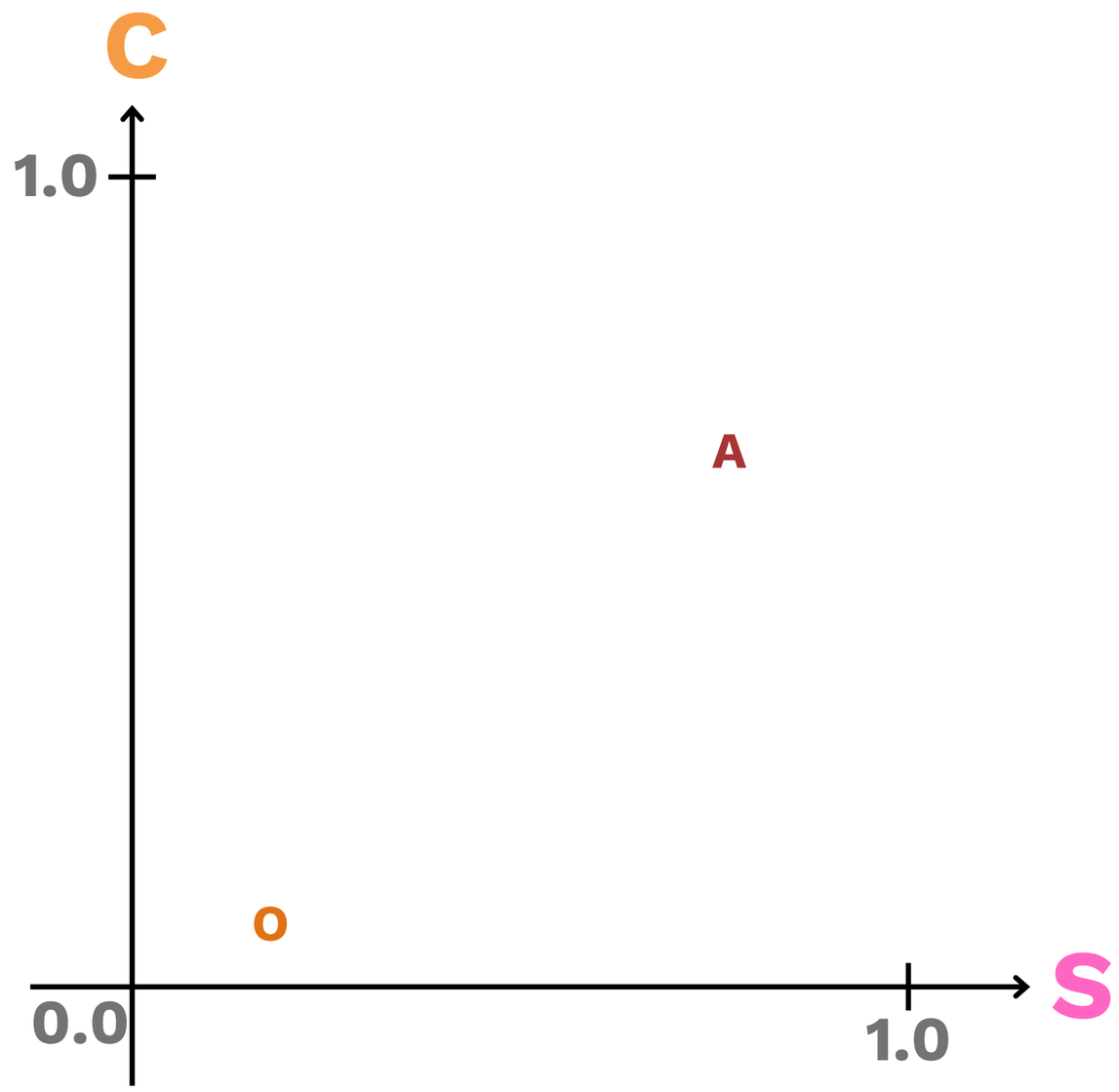
S


C
1.0
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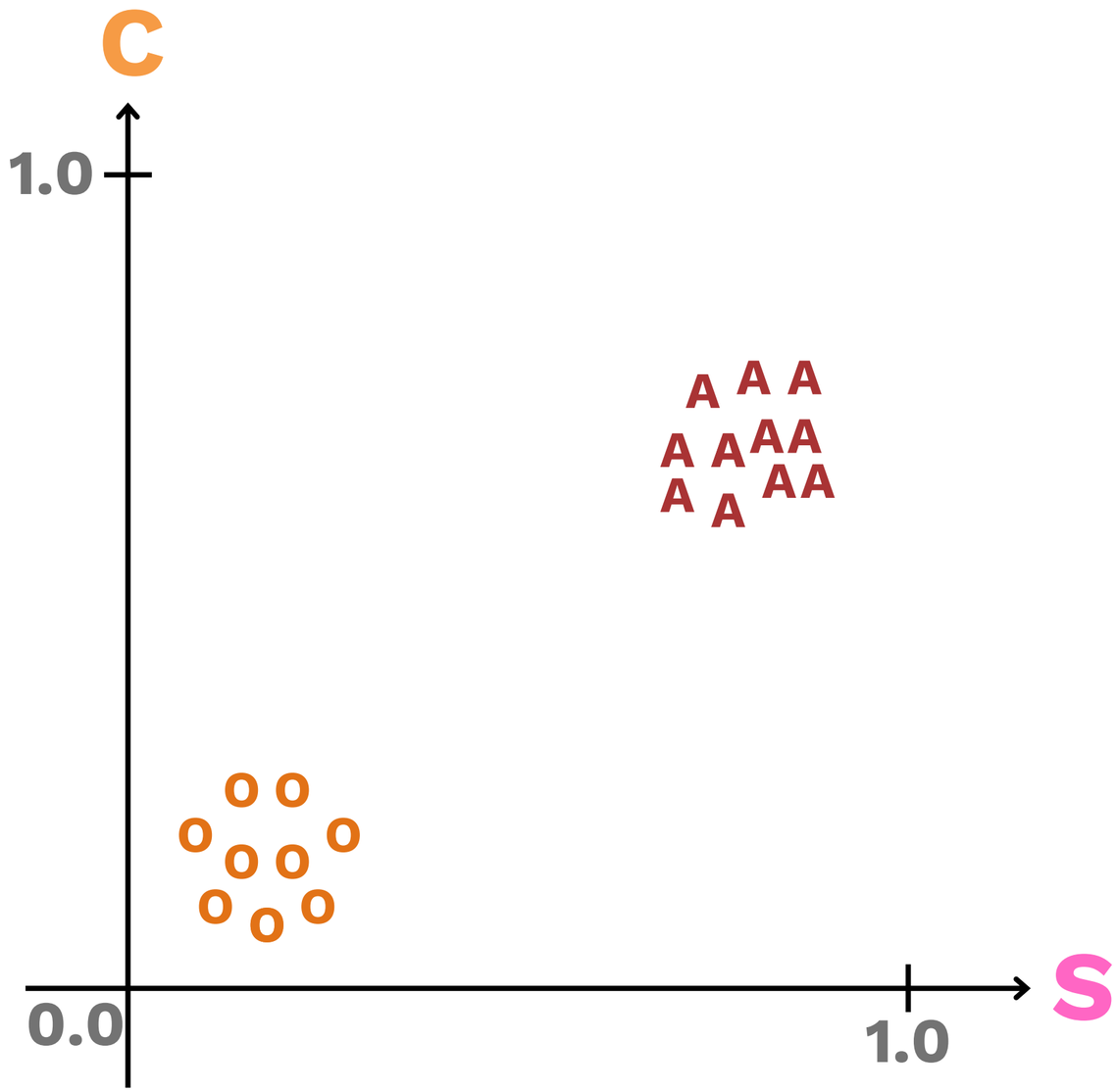
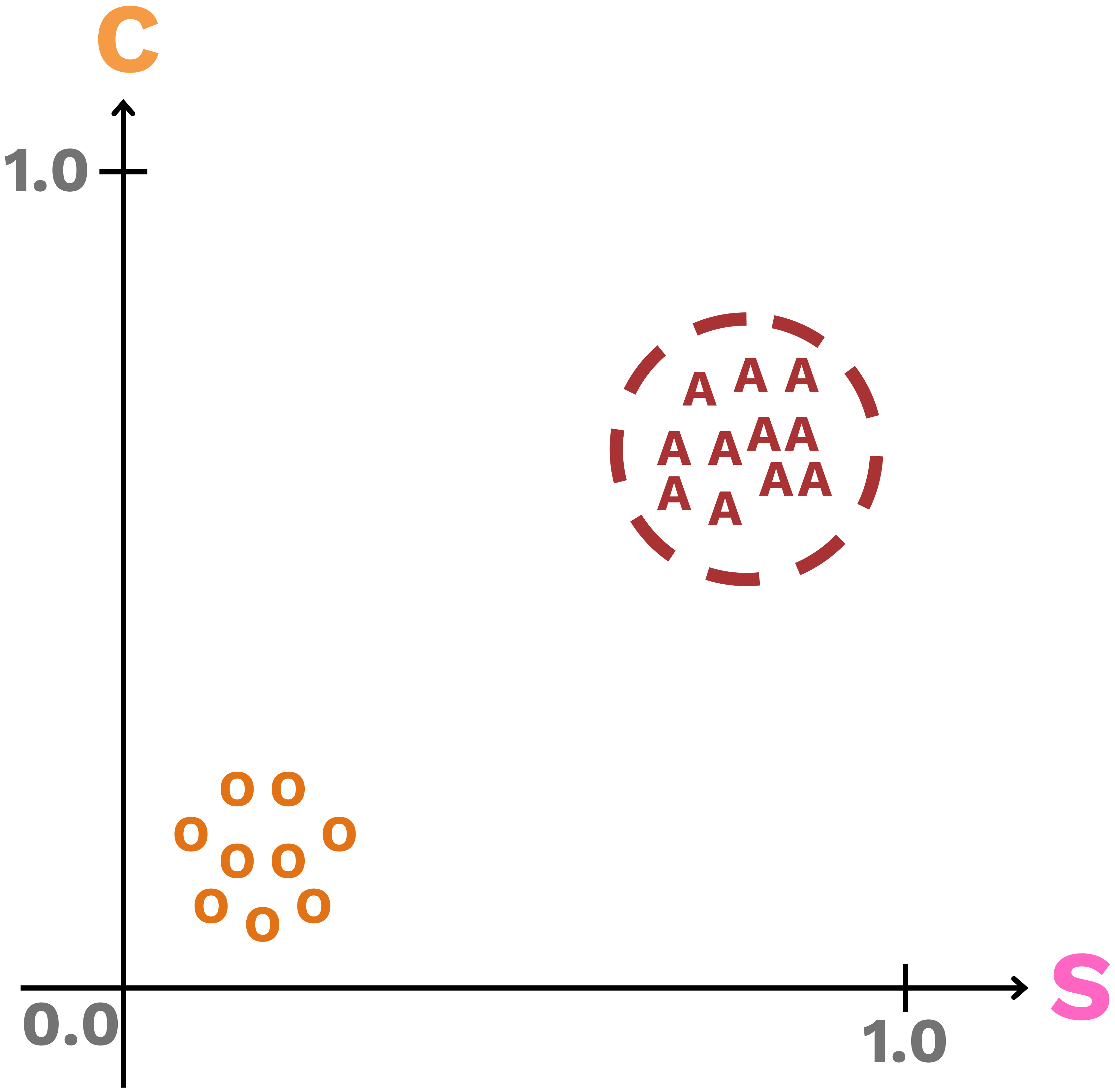
O
0.0
1.0
S


C
1.0
A A A
A A AA
A A AA
O O
O O O O
O O O
0.0
1.0
S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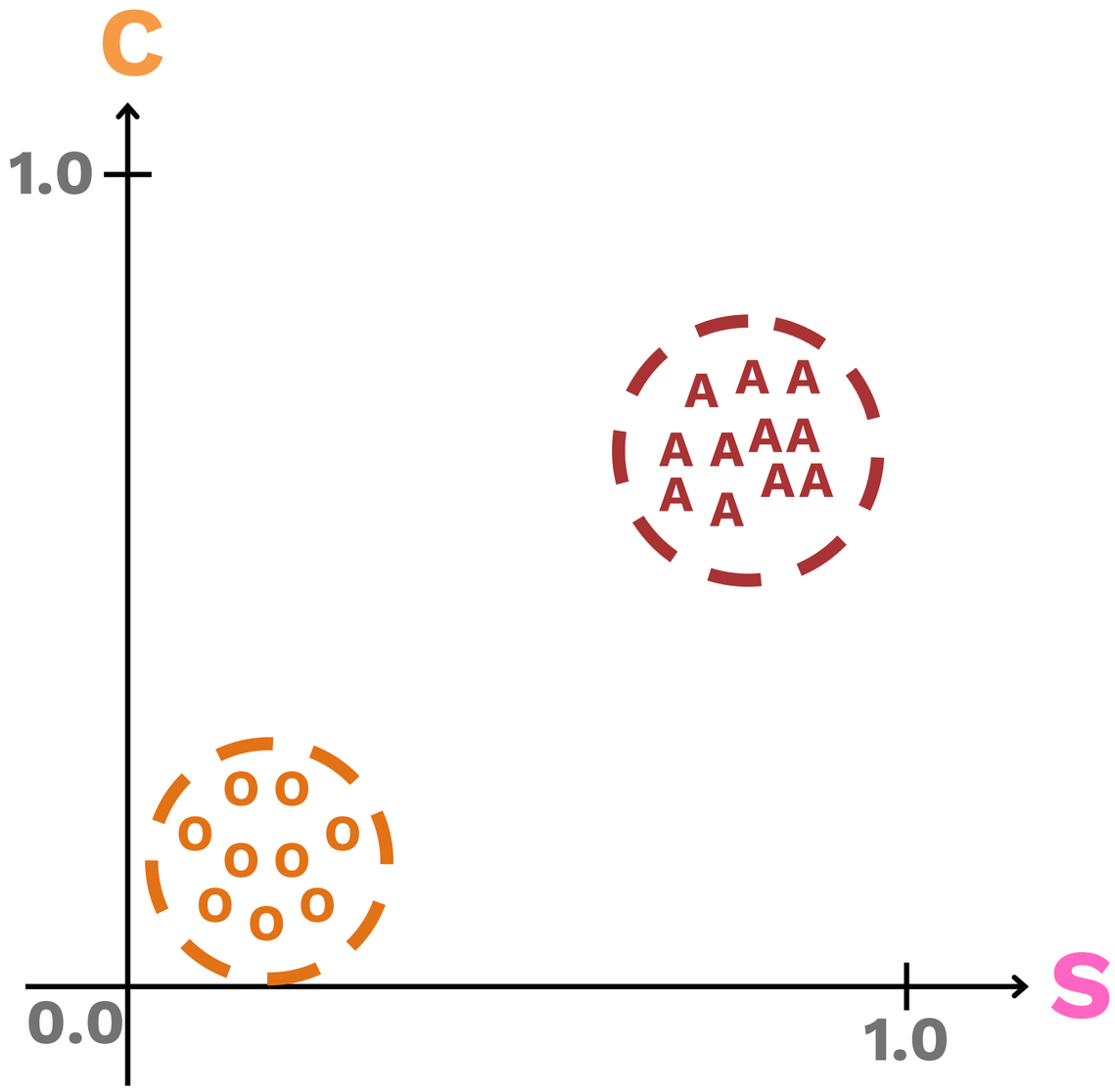
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A AA
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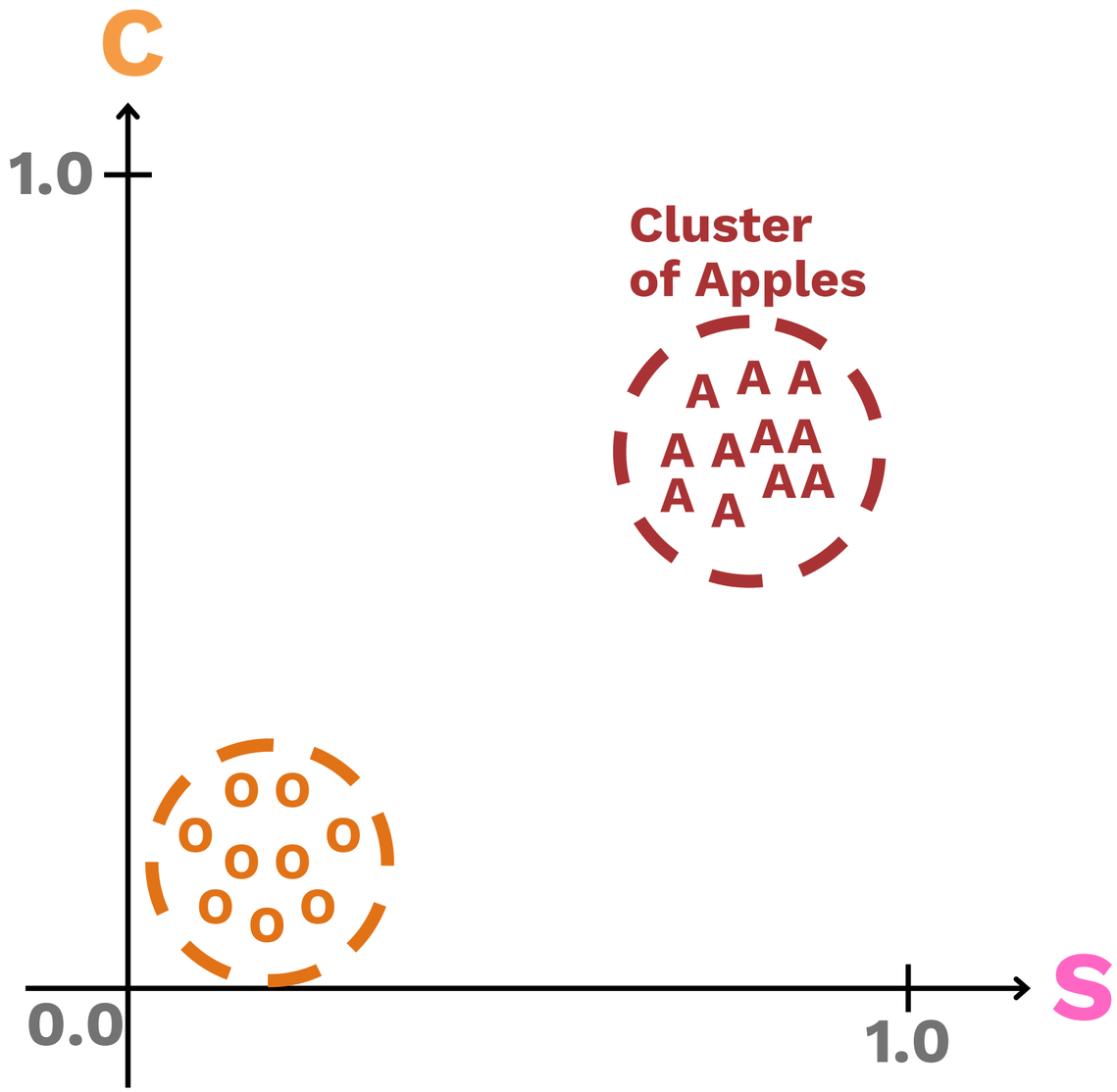
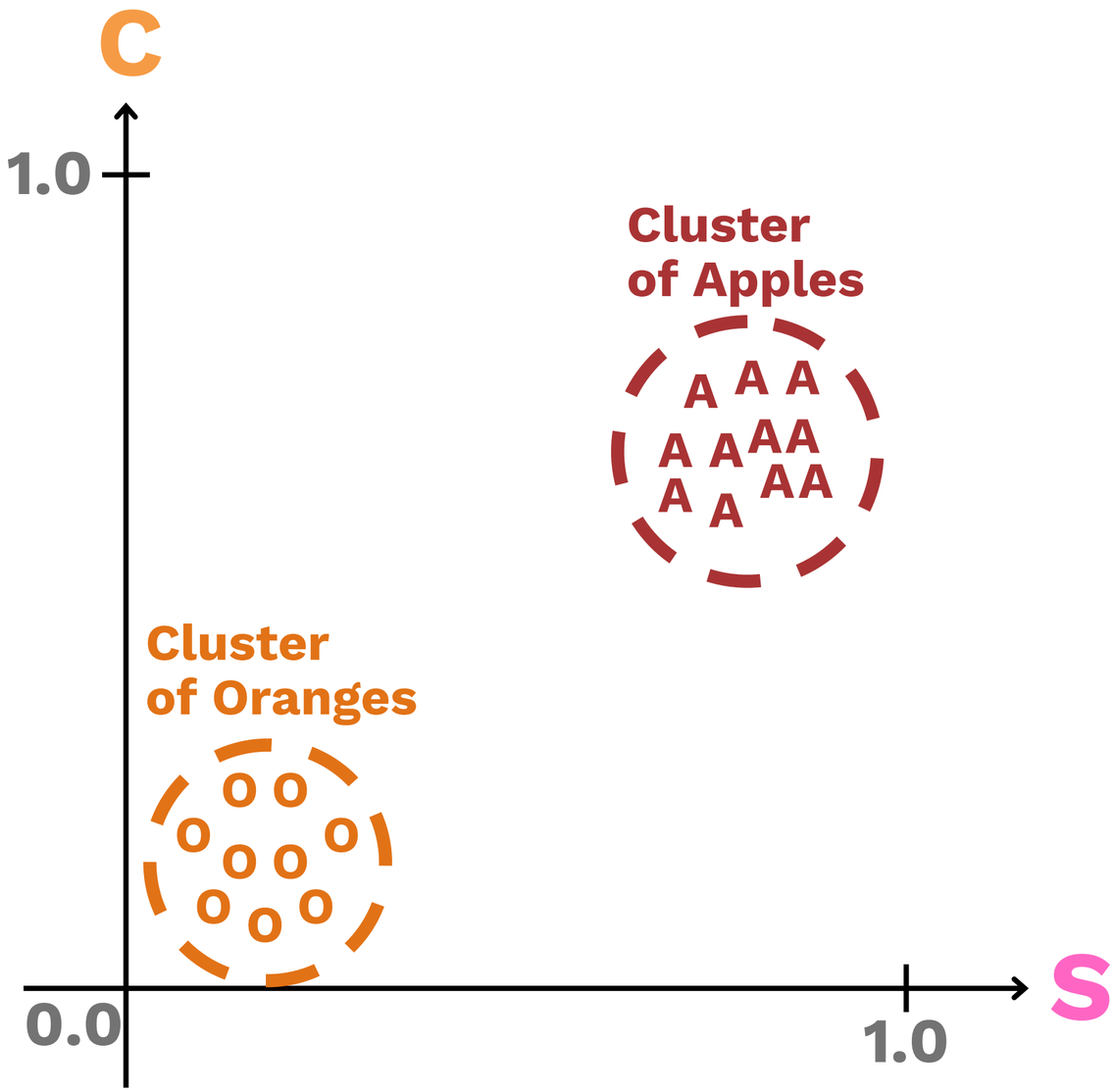
S


C
1.0
Cluster
of Apples
0.0
1.0
S


C
1.0
Cluster
of Apples
A A A
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A AA
A A
Cluster
of Oranges
O O
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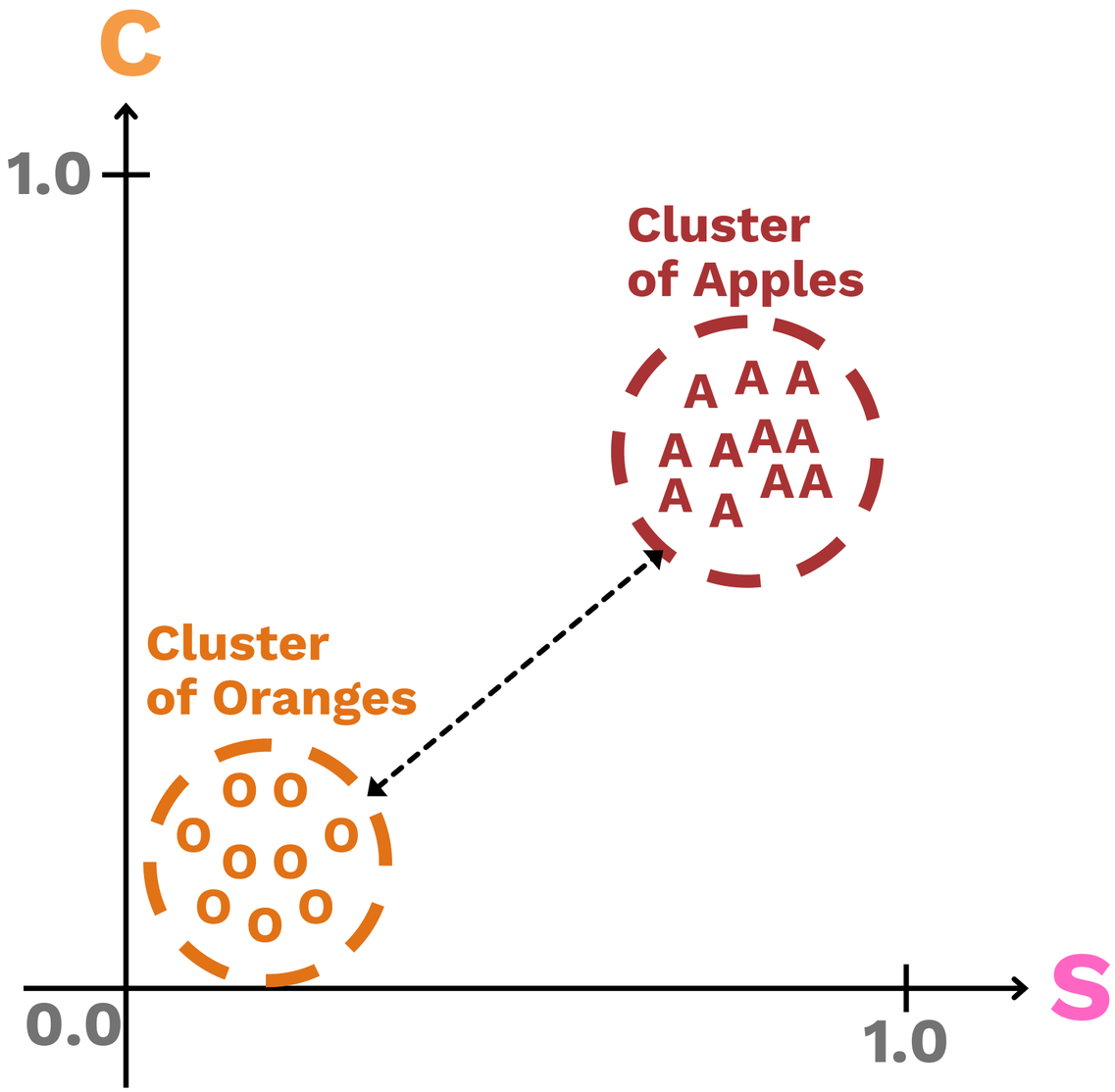
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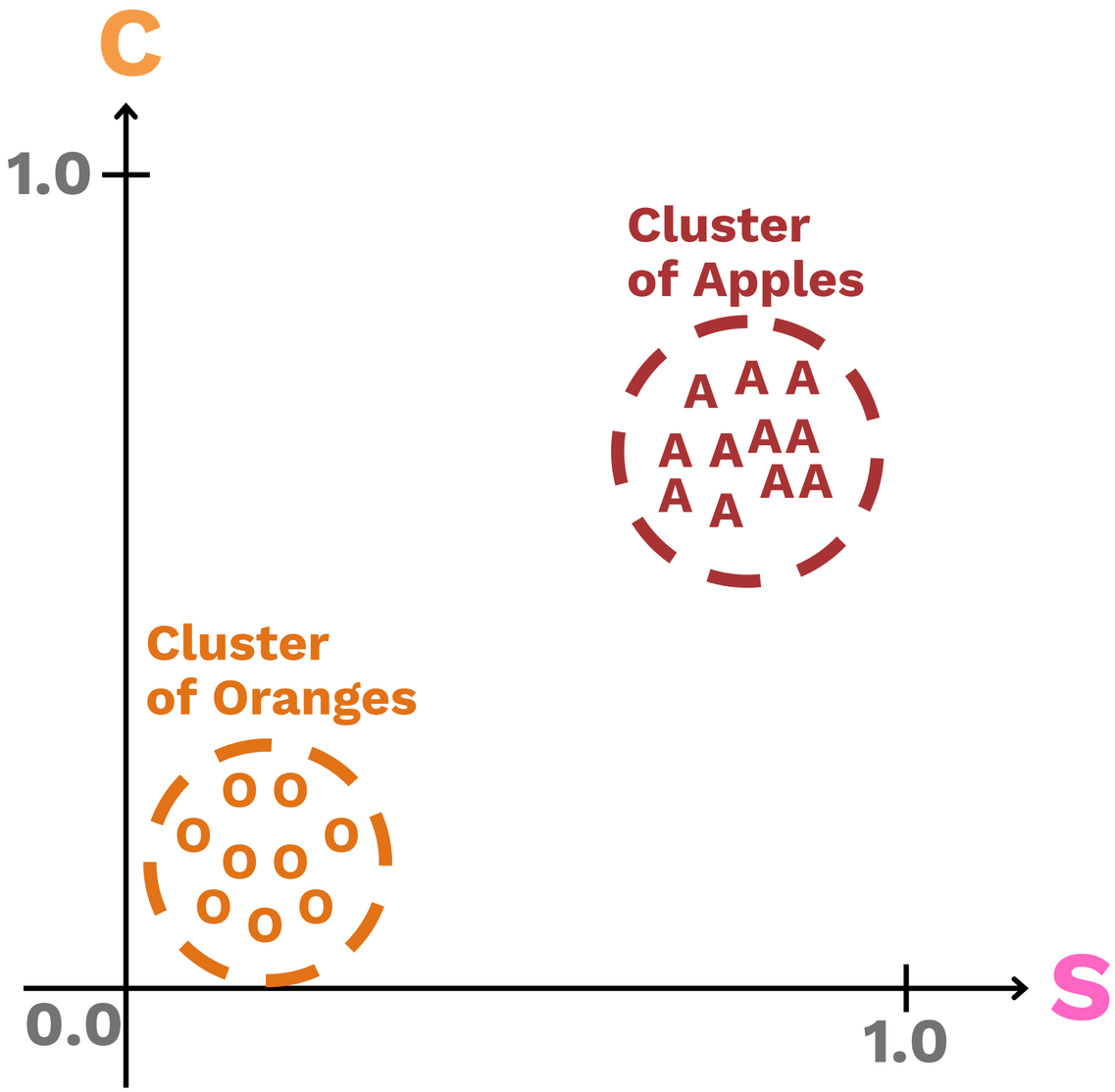
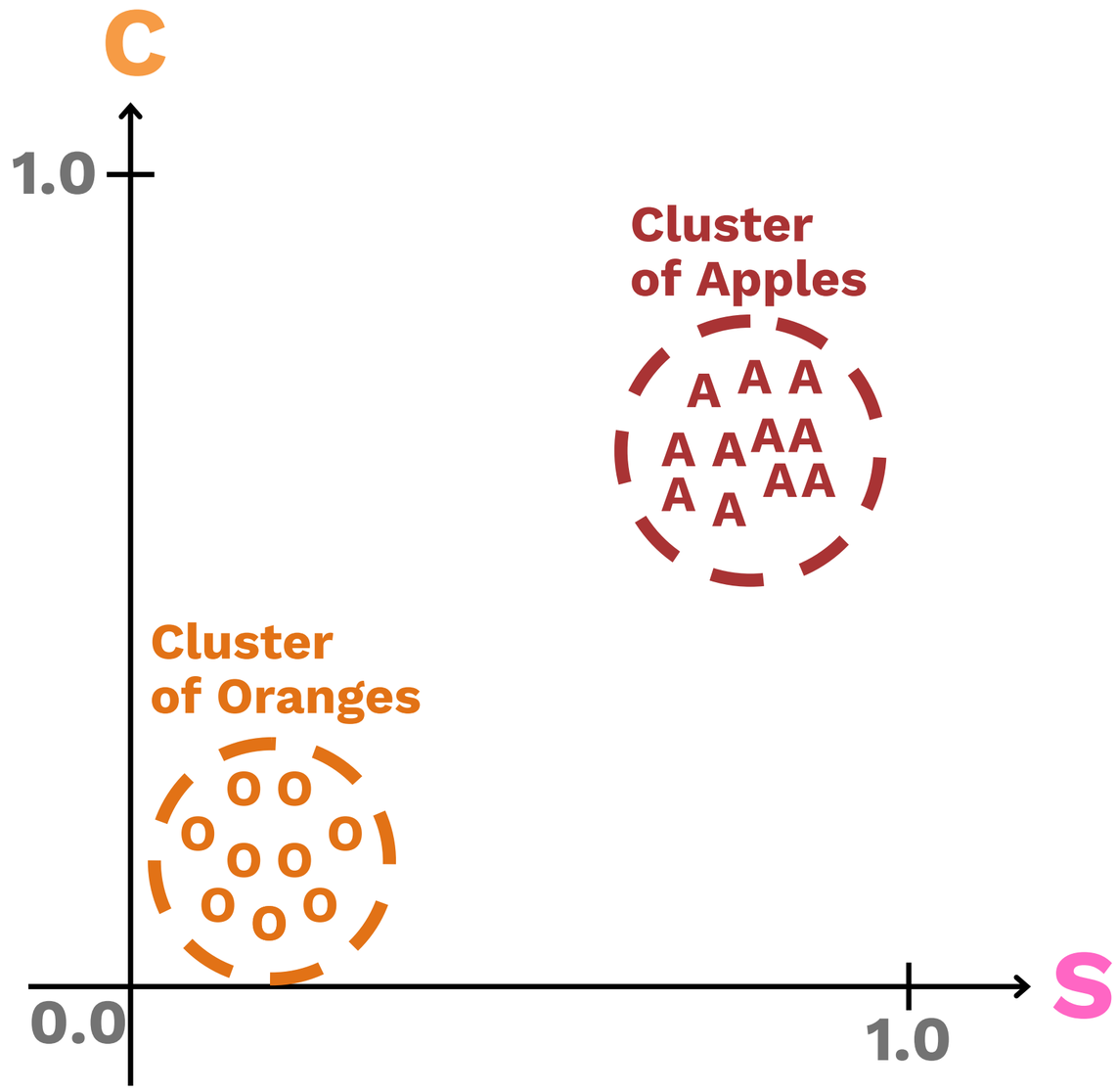

C
1.0
Cluster
of Apples
A A A
A AA
A AA
A A
Cluster
of Oranges
O O
O O
O O O
O O O
0.0
1.0
S

How can AI Recognise between Apples & Oranges?


C
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Cluster
of Apples
A A A
A AA
A AA
A A
Cluster
of Oranges
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O O O
0.0
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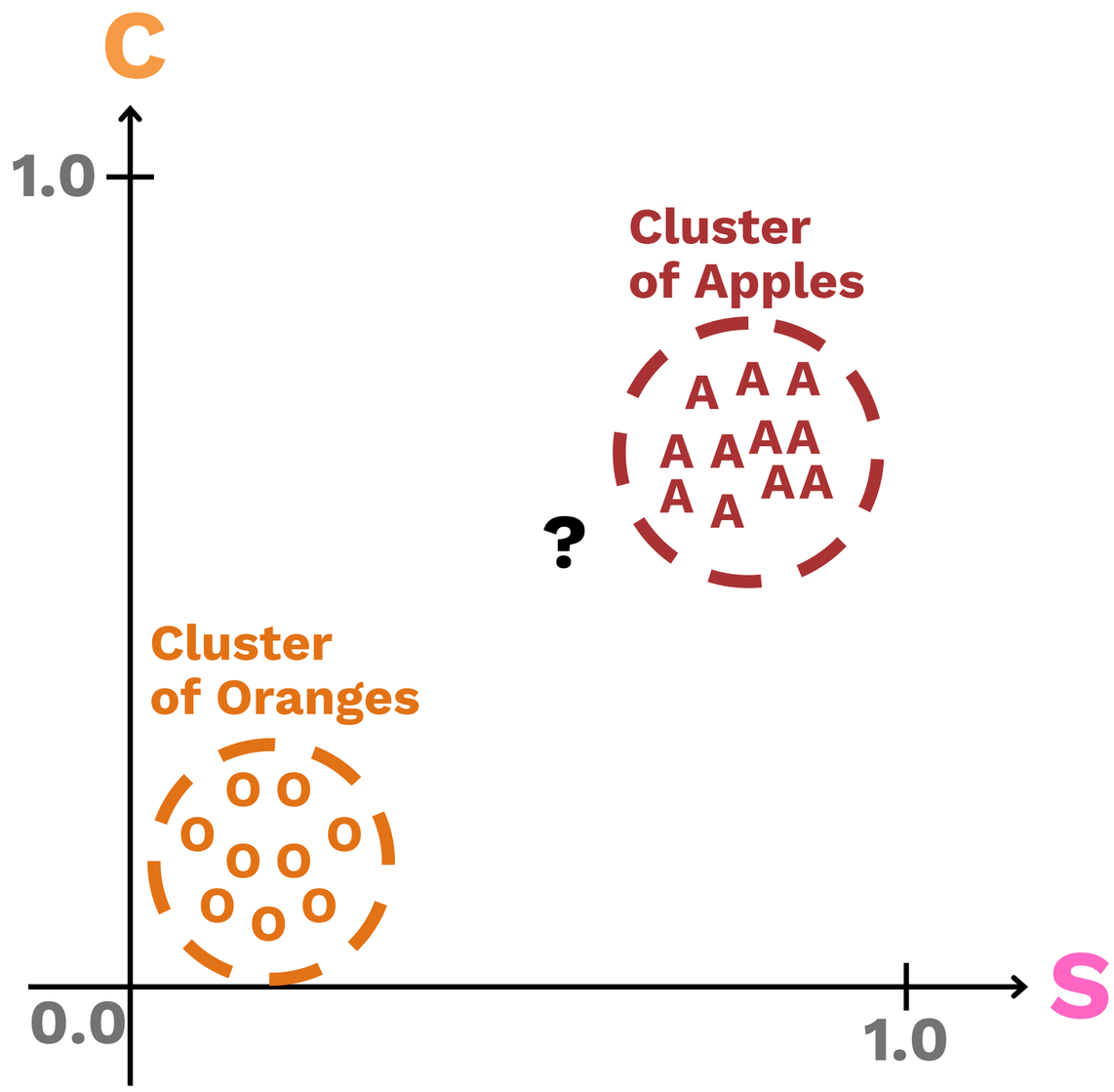
S


?

(S, C) = (0.6, 0.5)


C
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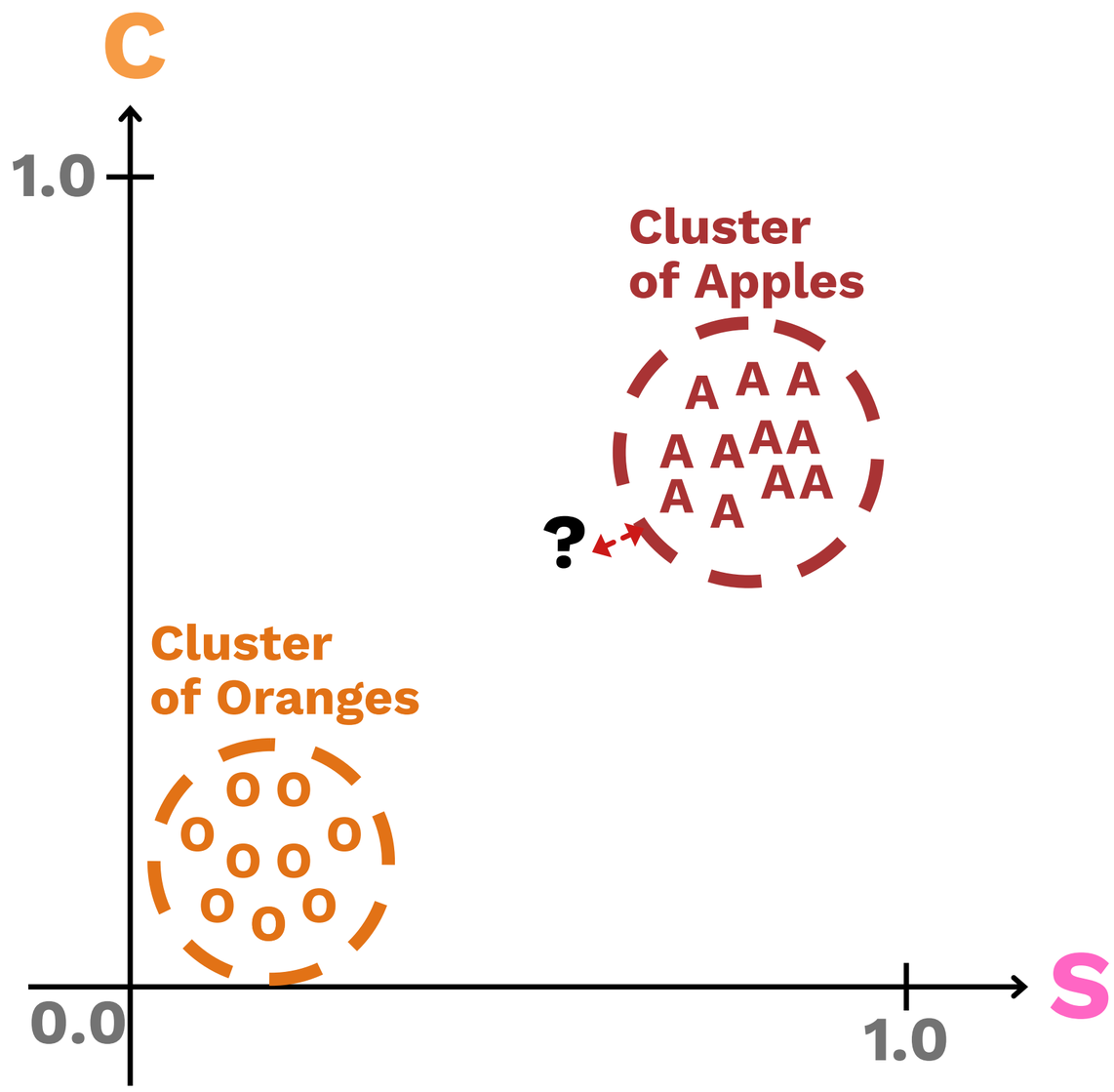
S


?

(S, C) = (0.6, 0.5)


C
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Cluster
of Apples
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Cluster
of Oranges
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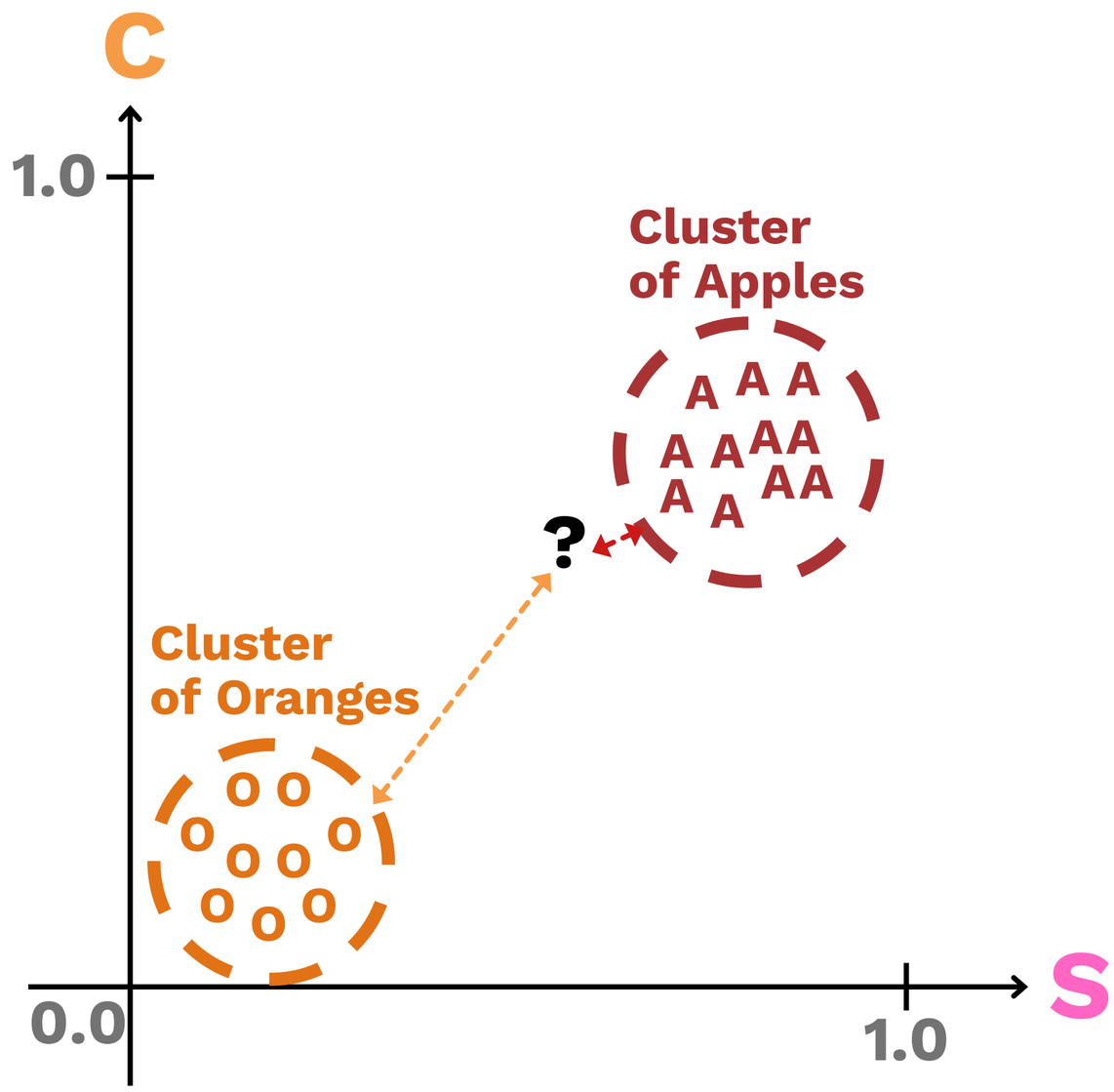
S


?

(S, C) = (0.6, 0.5)


C
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of Apples
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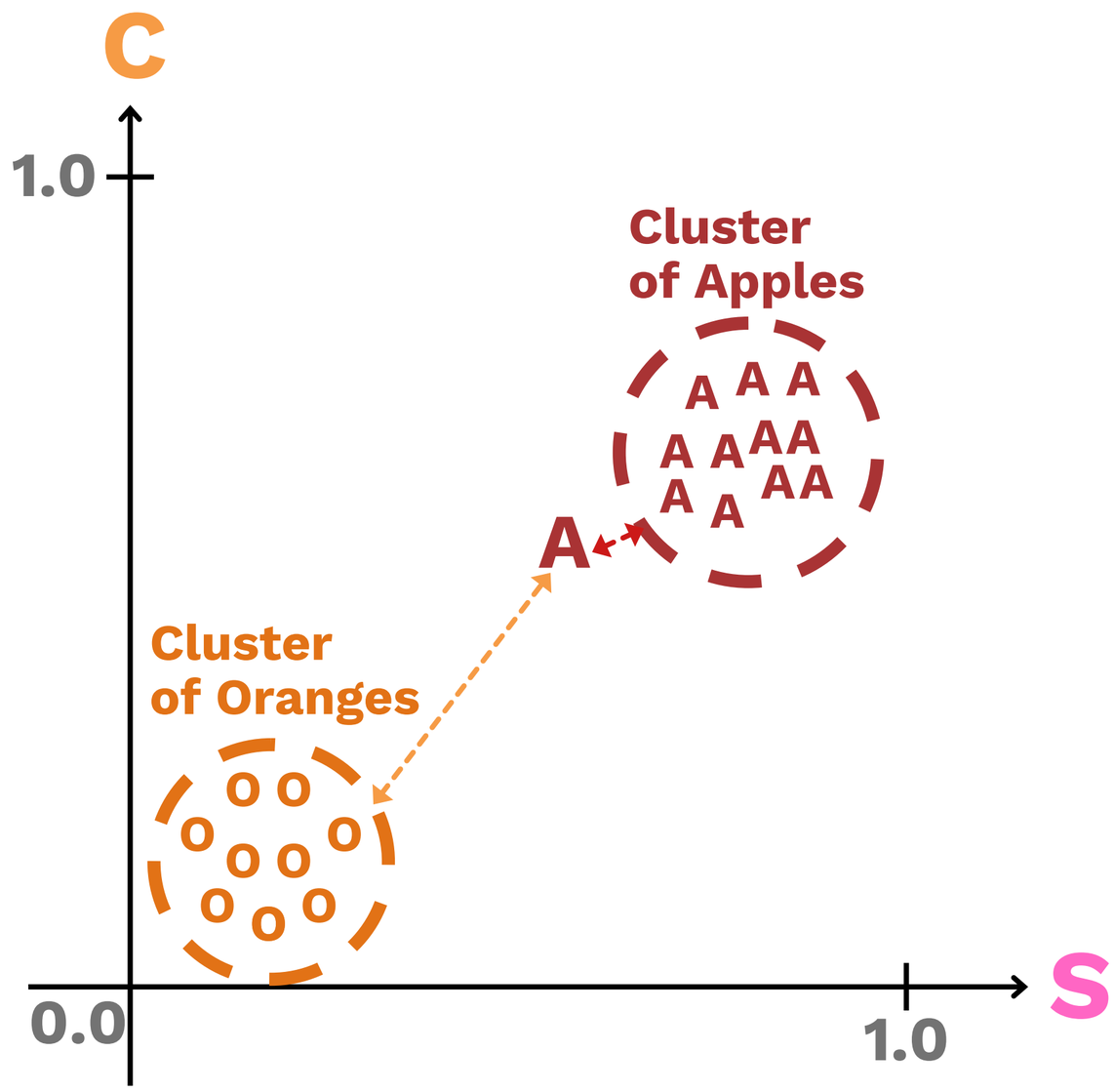
S

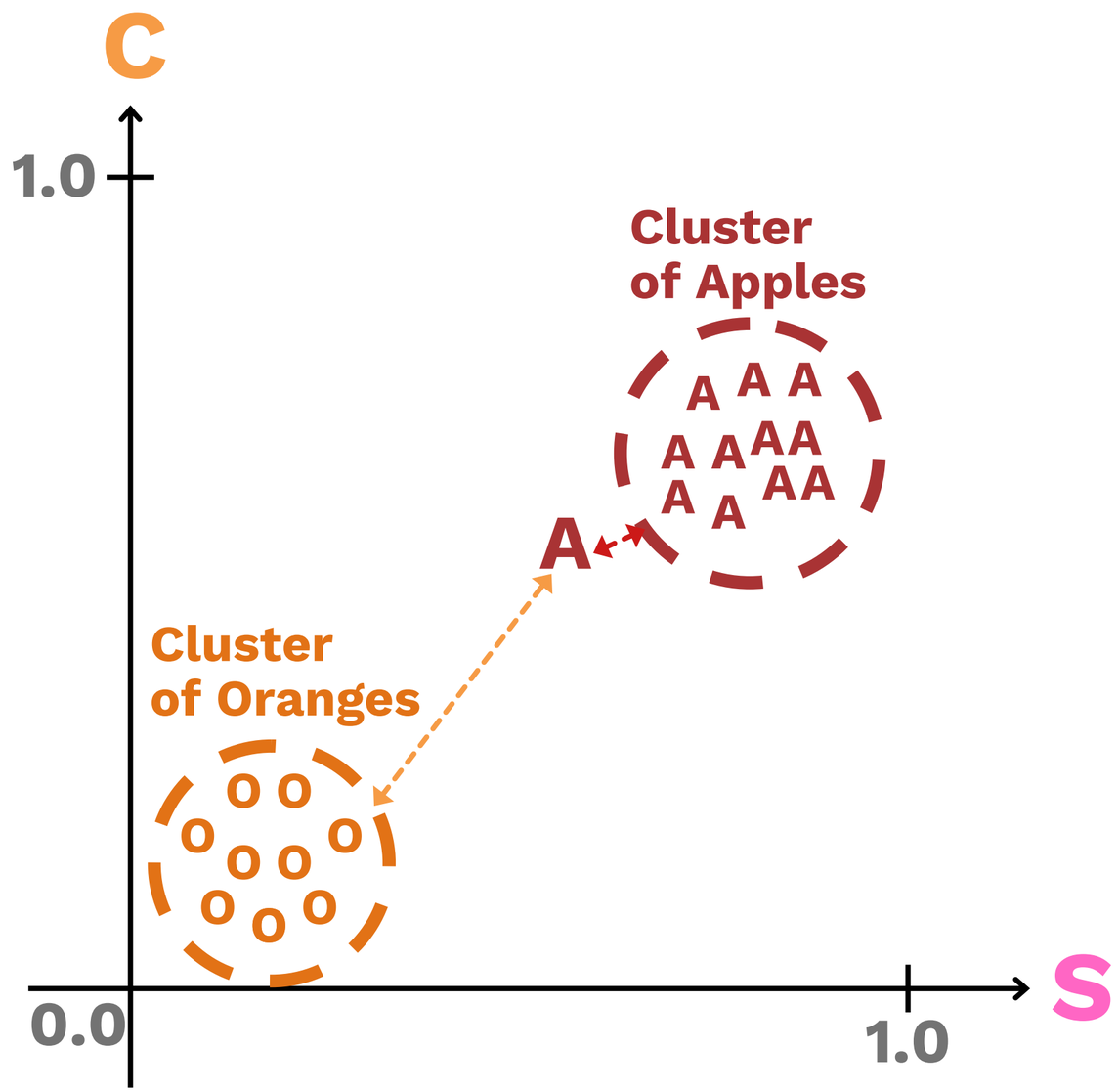

?

(S, C) = (0.6, 0.5)


C
1.0
Cluster
of Apples
A A A
A AA
A AA
A A
A
Cluster
of Oranges
O O
O O
O O O
O O O
0.0
1.0
S

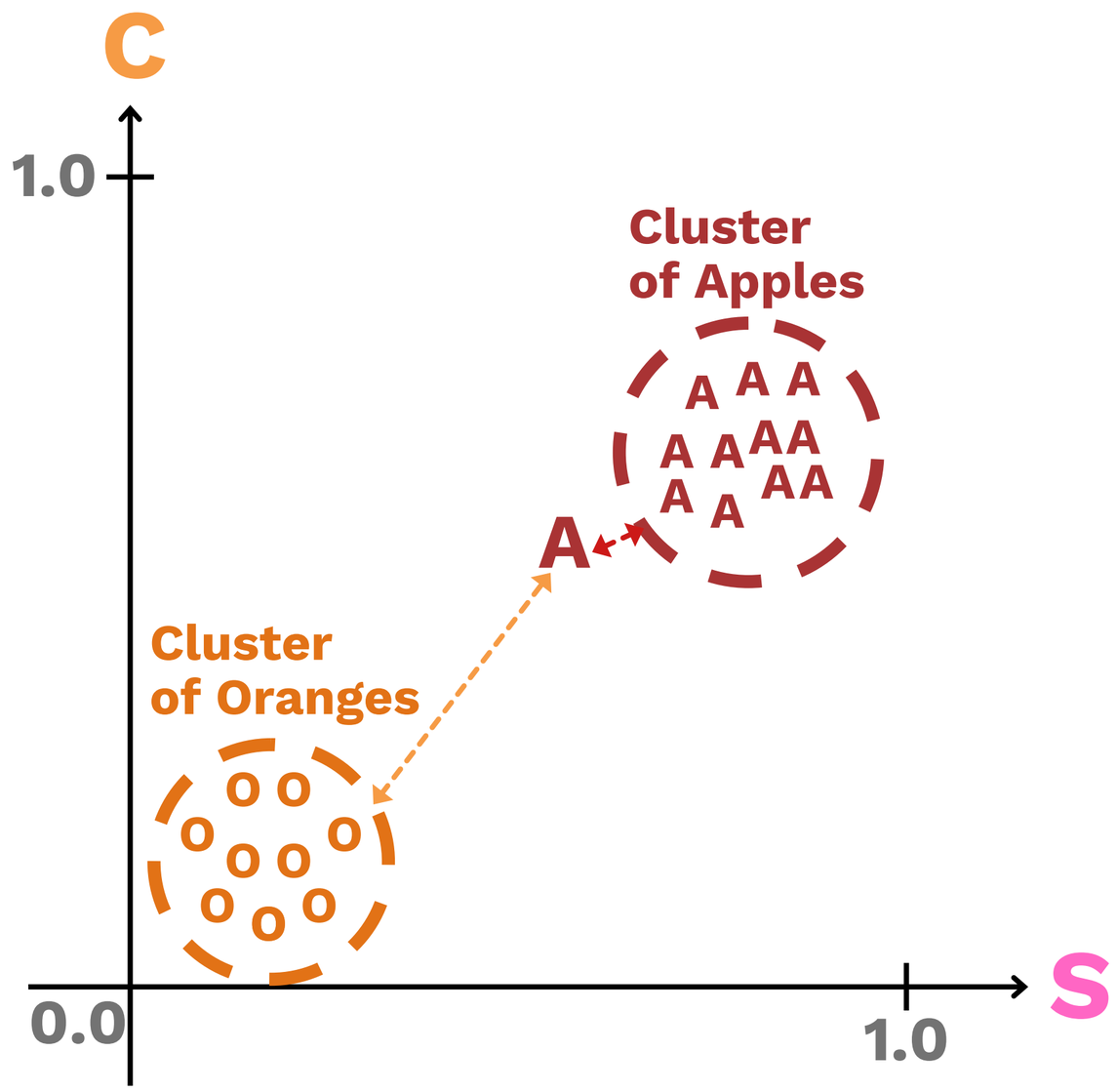
(S, C) = (0.6, 0.5)

This is *Semantic Similarity*



This is *Semantic Similarity*

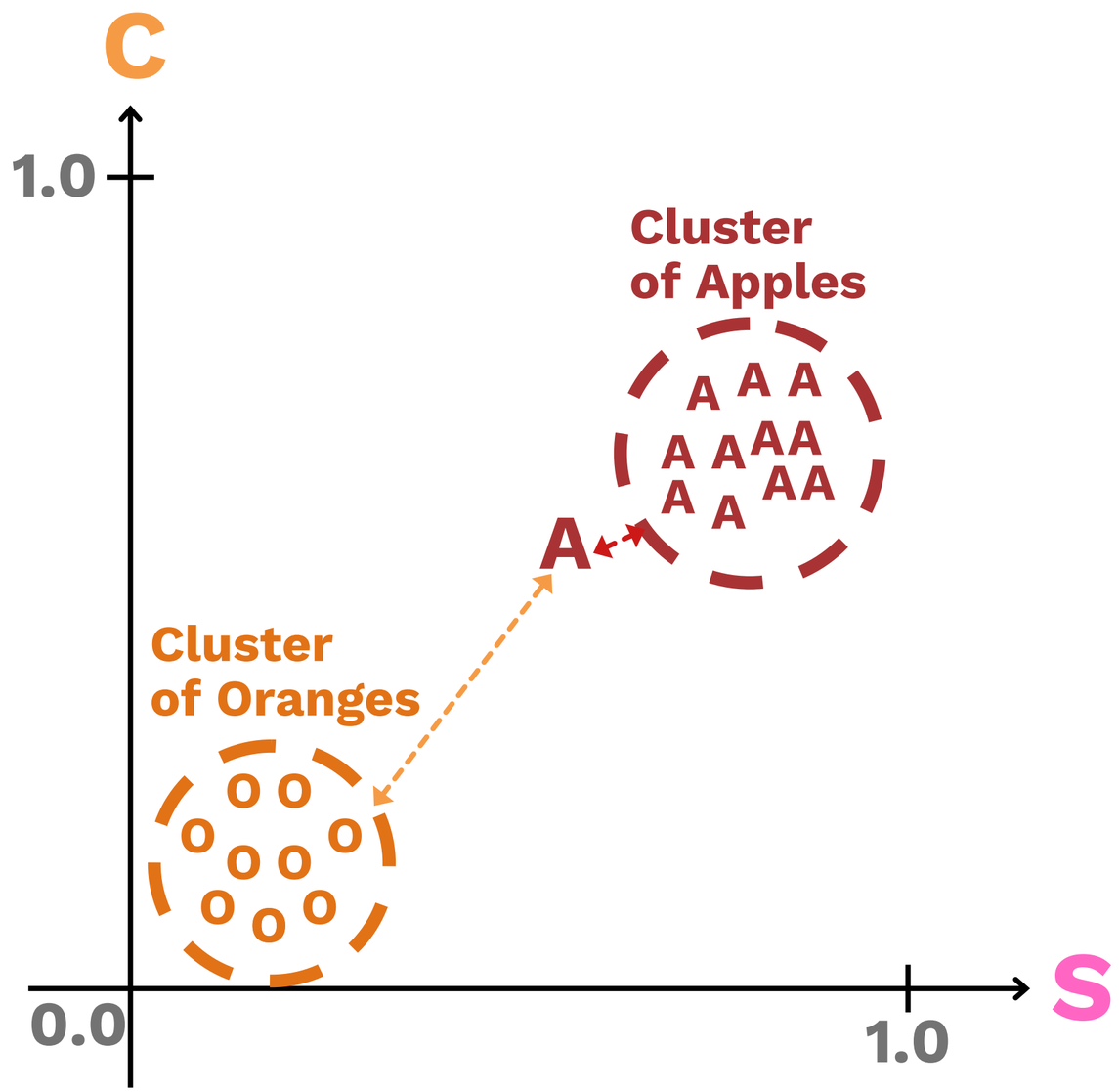
Grouping up ***similar*** **items**
based on its ***semantic***



This is *Semantic Similarity*

Grouping up ***similar*** **items** *based on its* ***semantic***

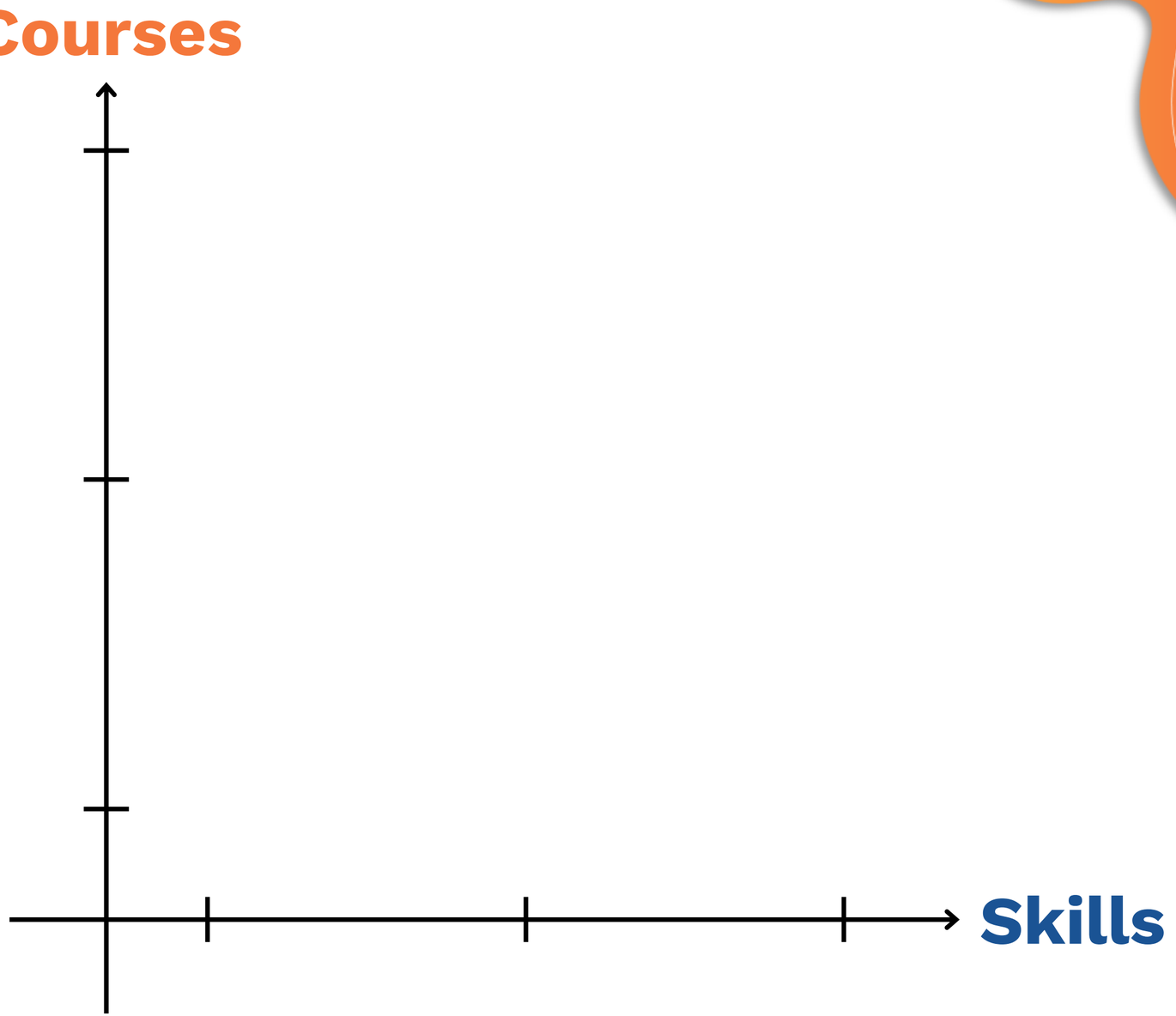
Classifying **unknown items** by ***similarity*** using its ***semantic*** meaning



Can we apply this *technique* to advance *Skills Intelligence*?

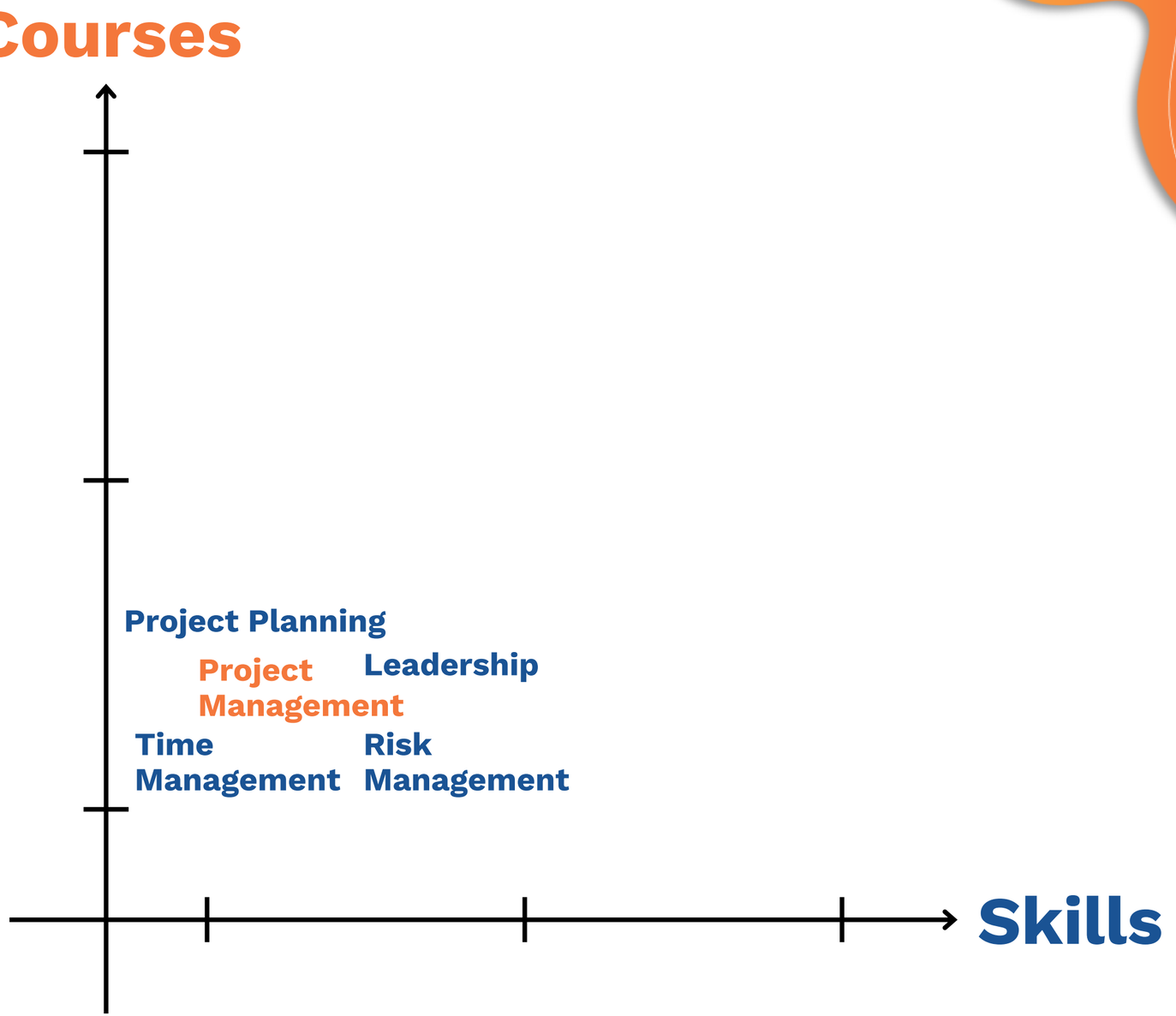
What if?

Find *Courses* by *Skills*?



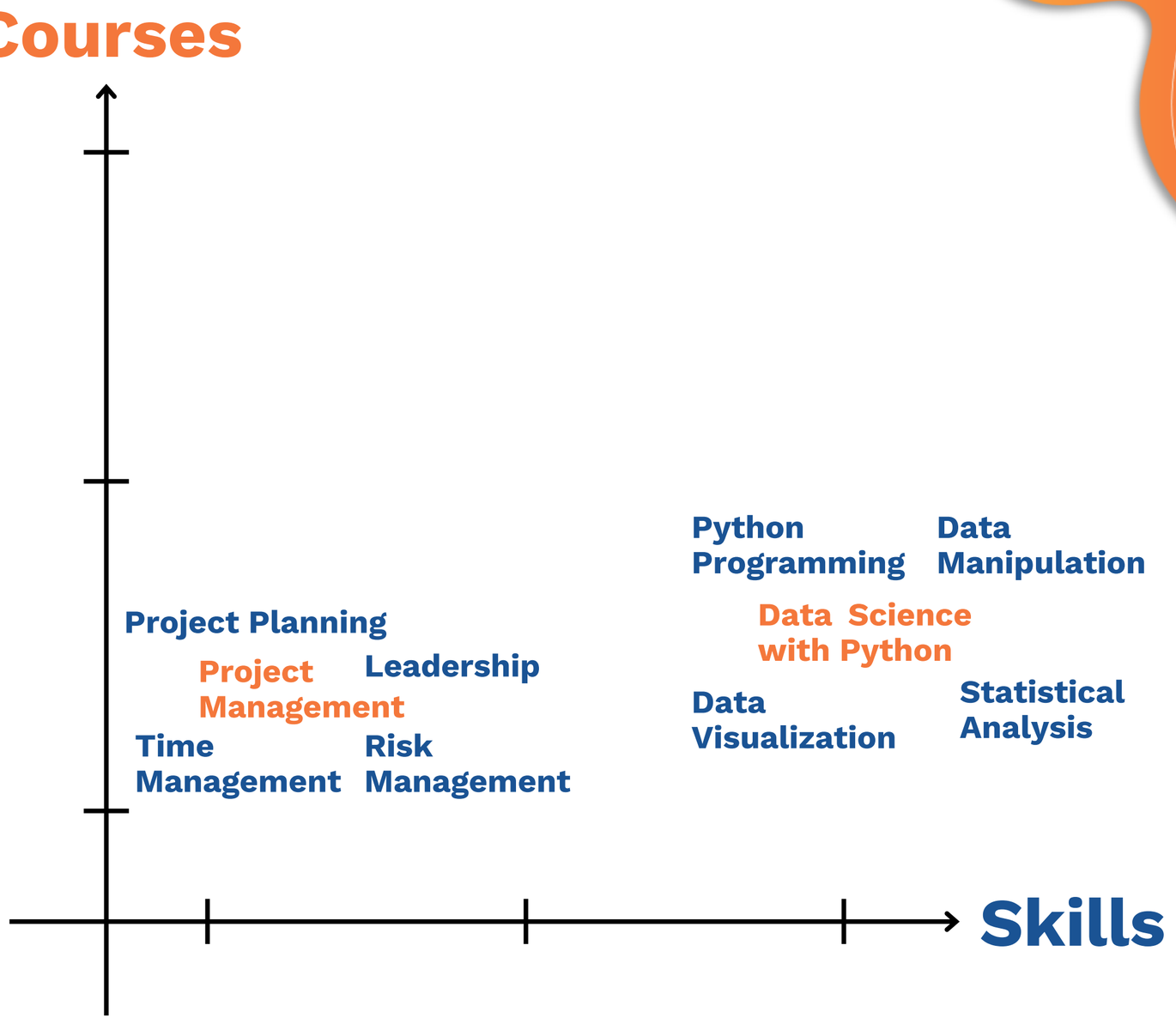
What if?

Find *Courses* by *Skills*?



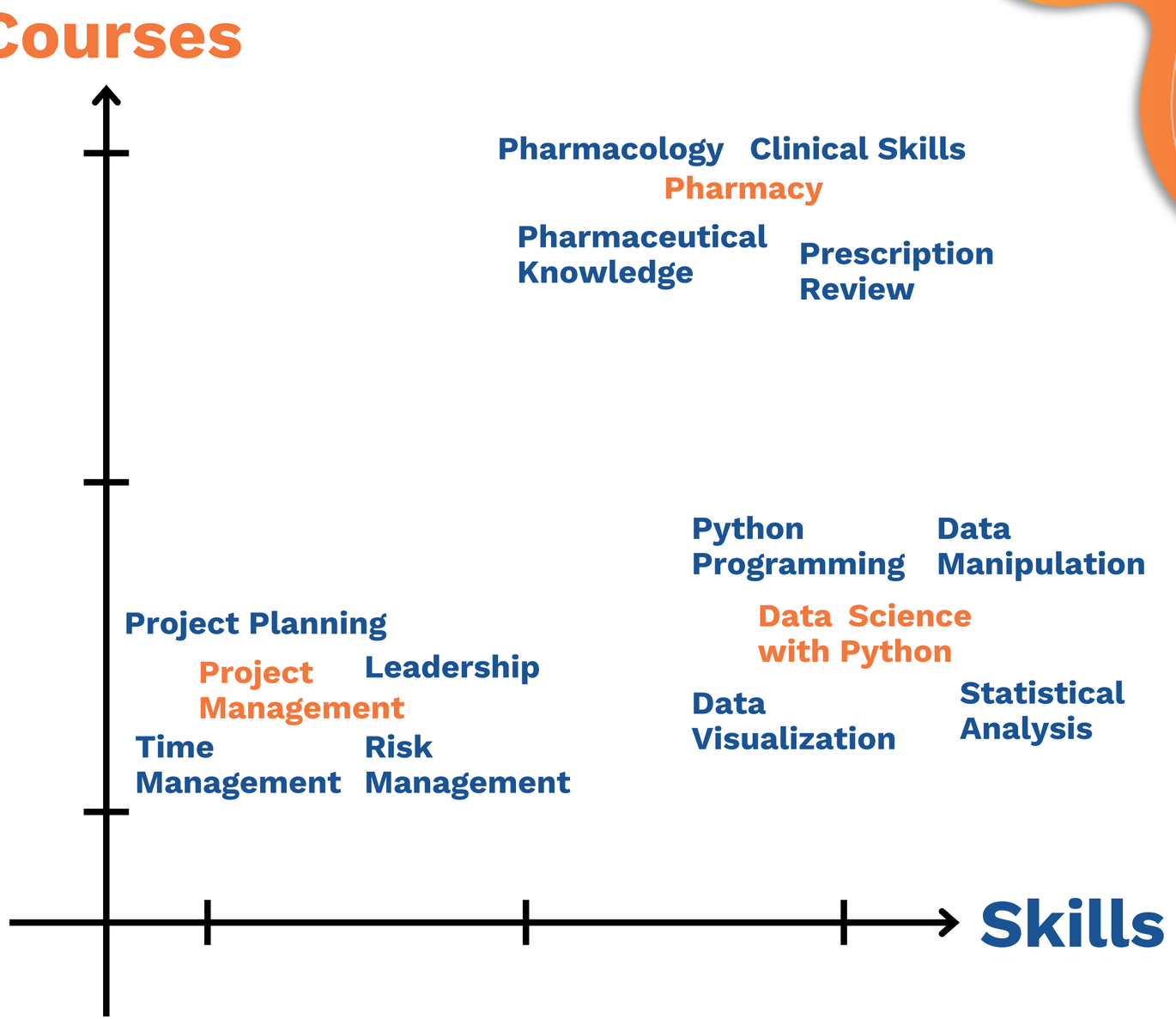
What if?

Find *Courses* by *Skills*?



What if?

Find *Courses* by *Skills*?



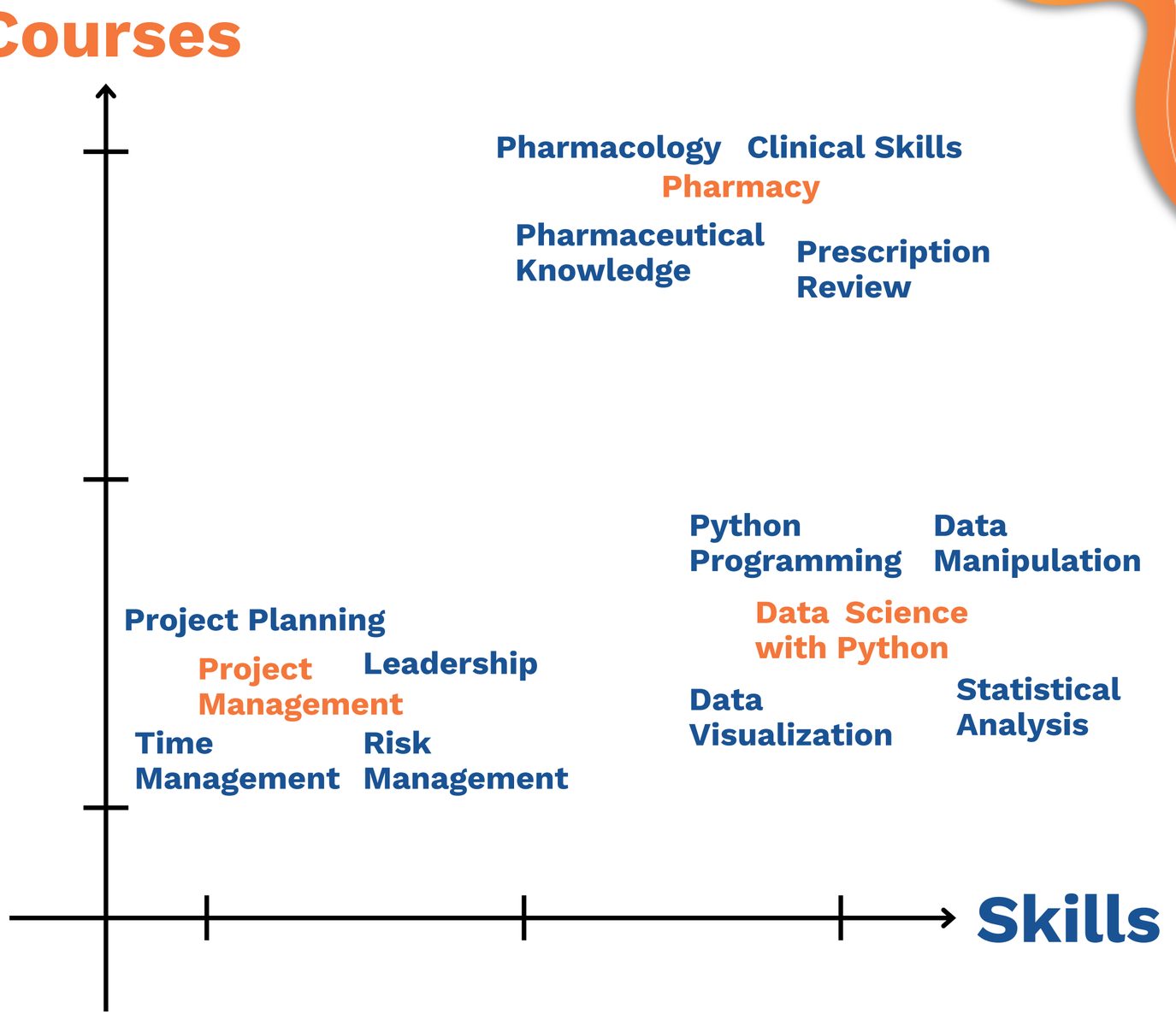
What if?

Find *Courses* by *Skills*?

Resource allocation (En)

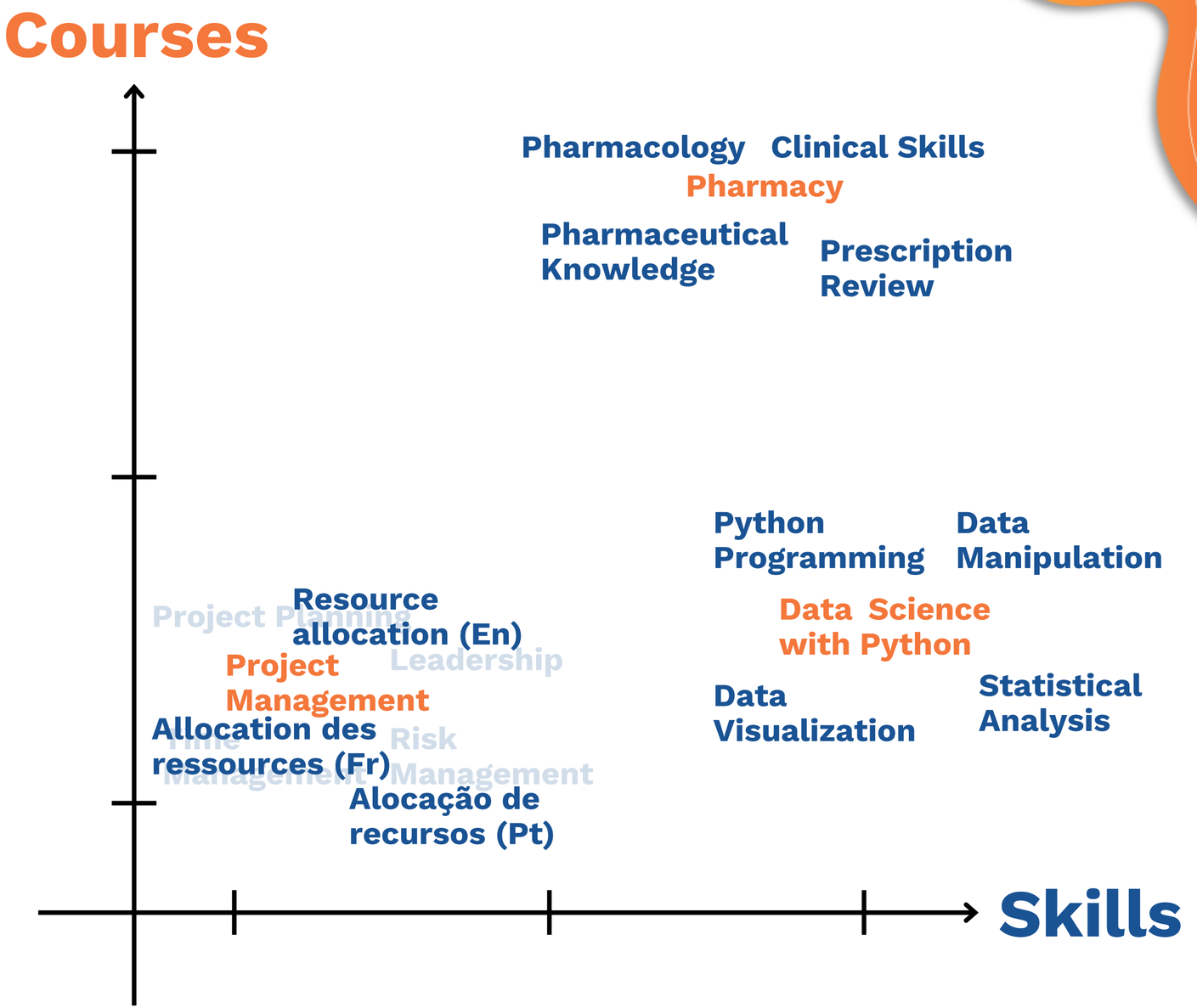
Allocation des ressources (Fr)

Alocação de recursos (Pt)



What if?

Find *Courses* by *Skills*?

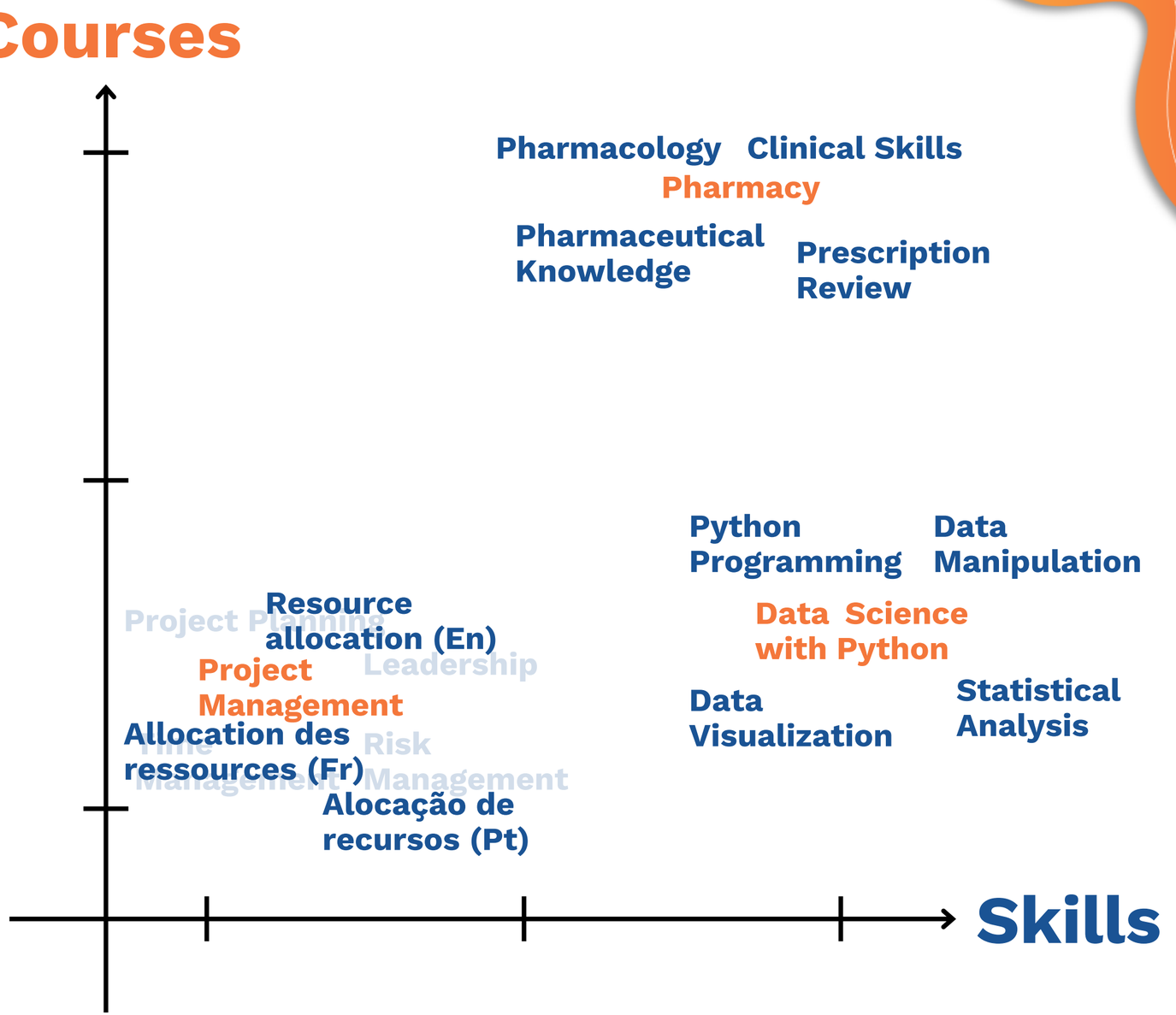


What if?

Find *Courses* by *Skills*?

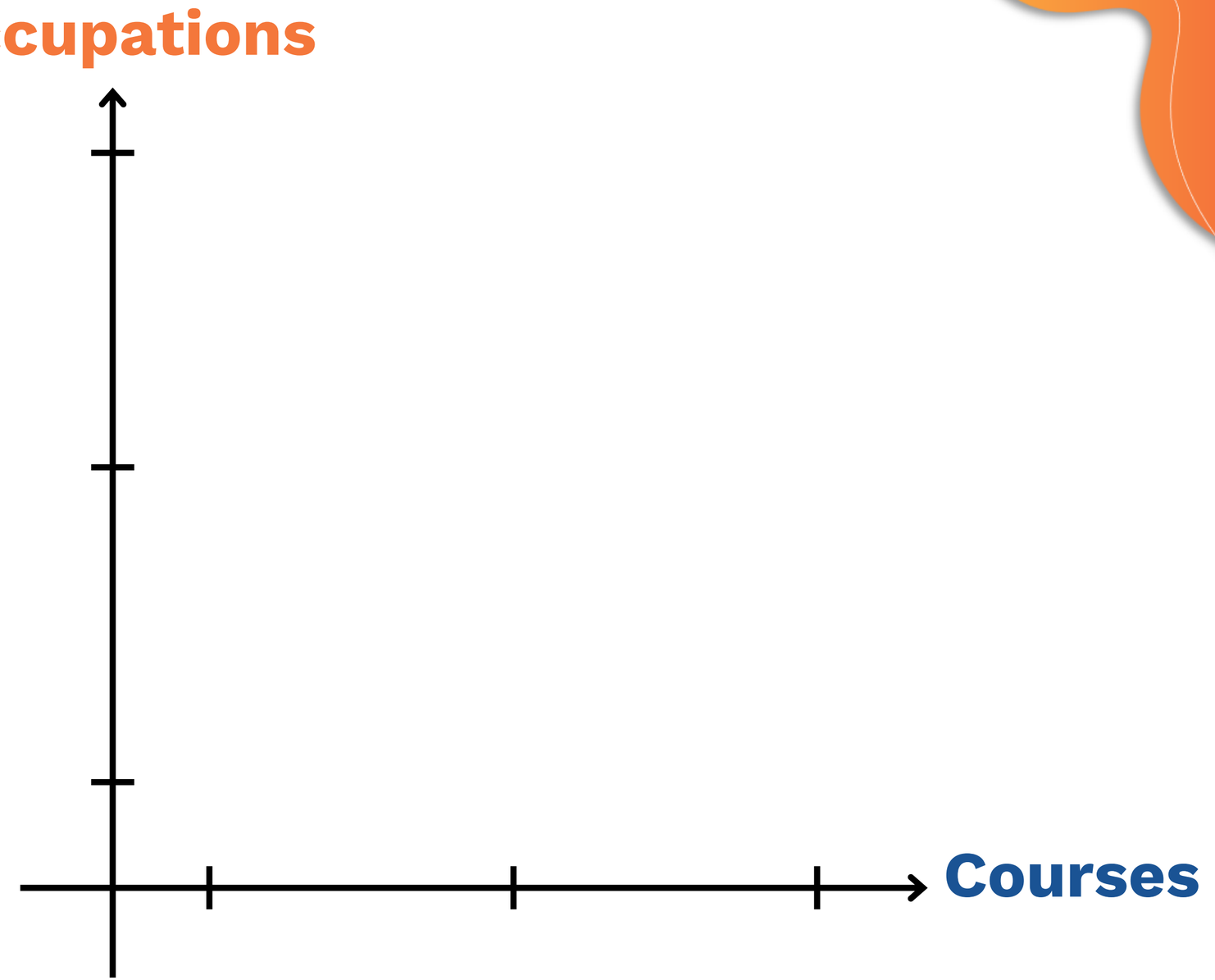
Suggested Course:

Project Management



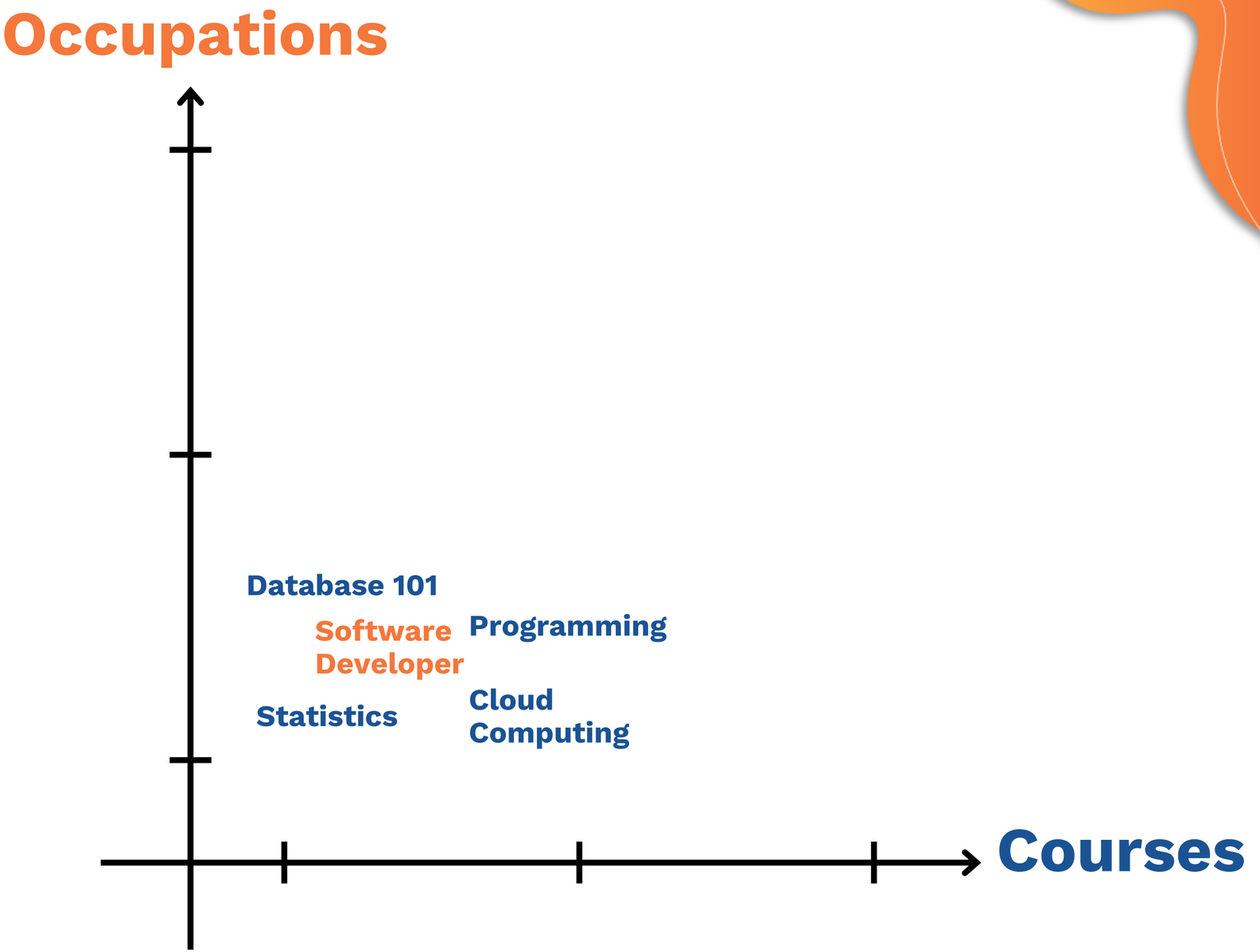
What if?

Find *Occupations*
by *Courses*?



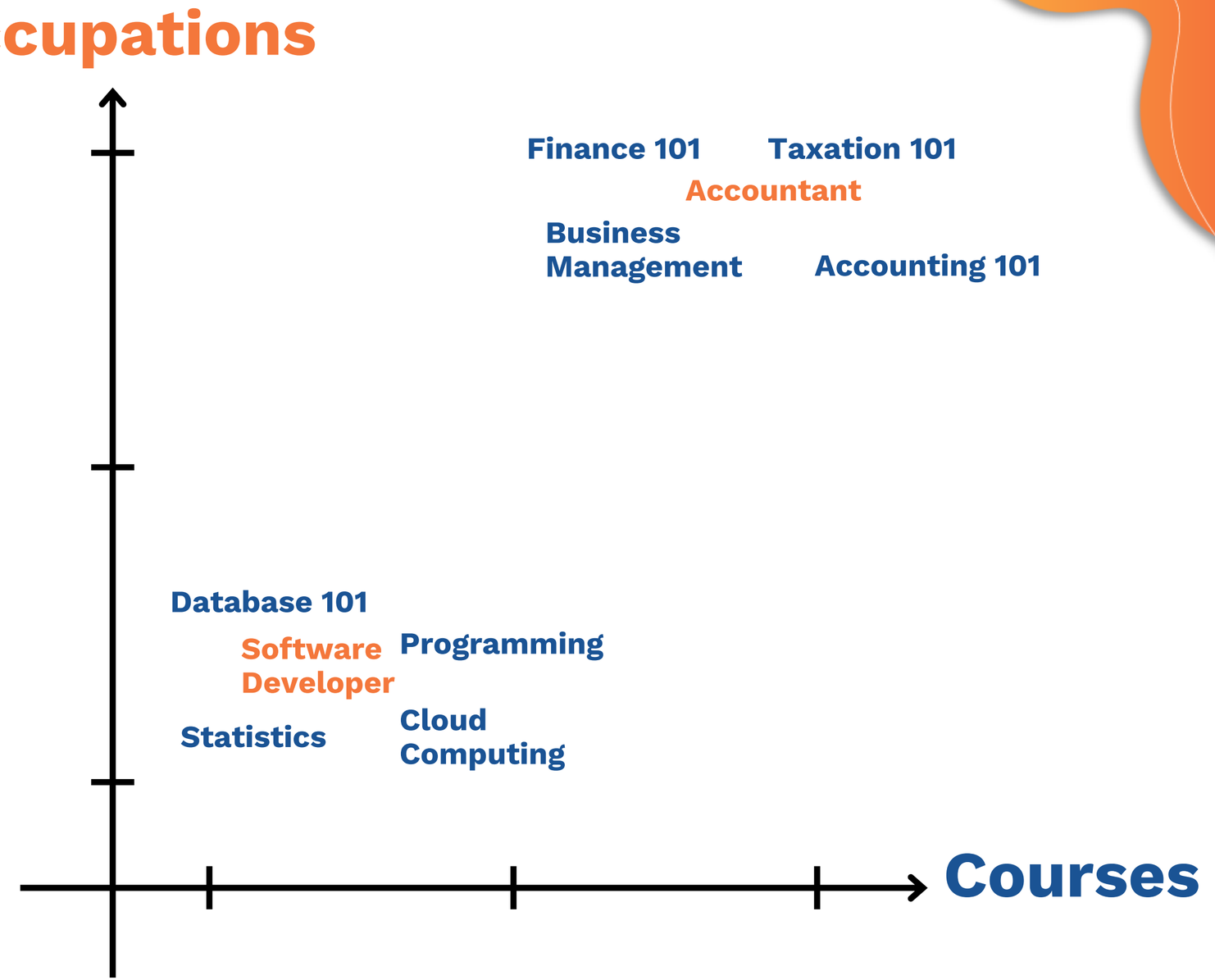
What if?

Find *Occupations* by *Courses*?



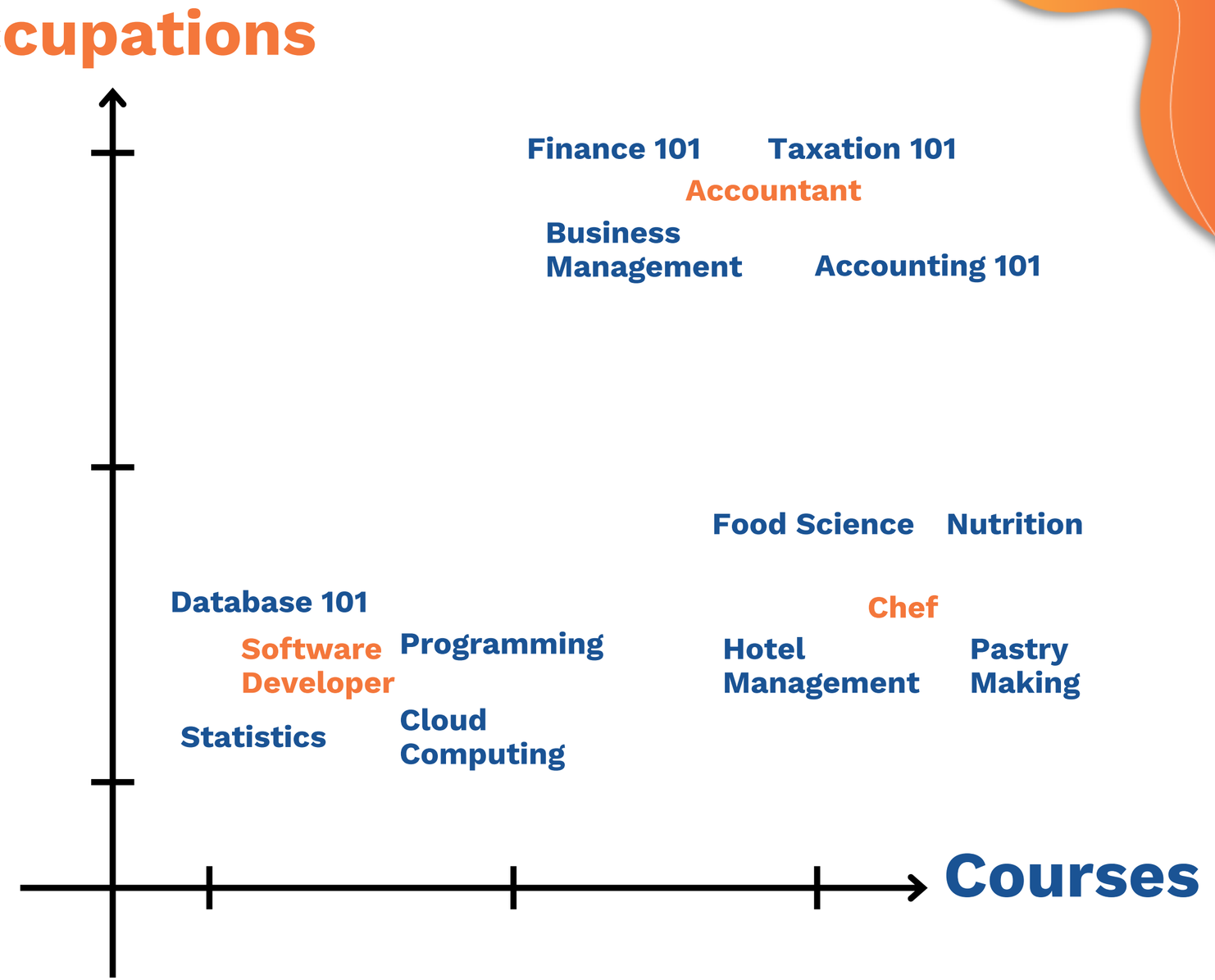
What if?

Find *Occupations* by *Courses*?



What if?

Find *Occupations* by *Courses*?



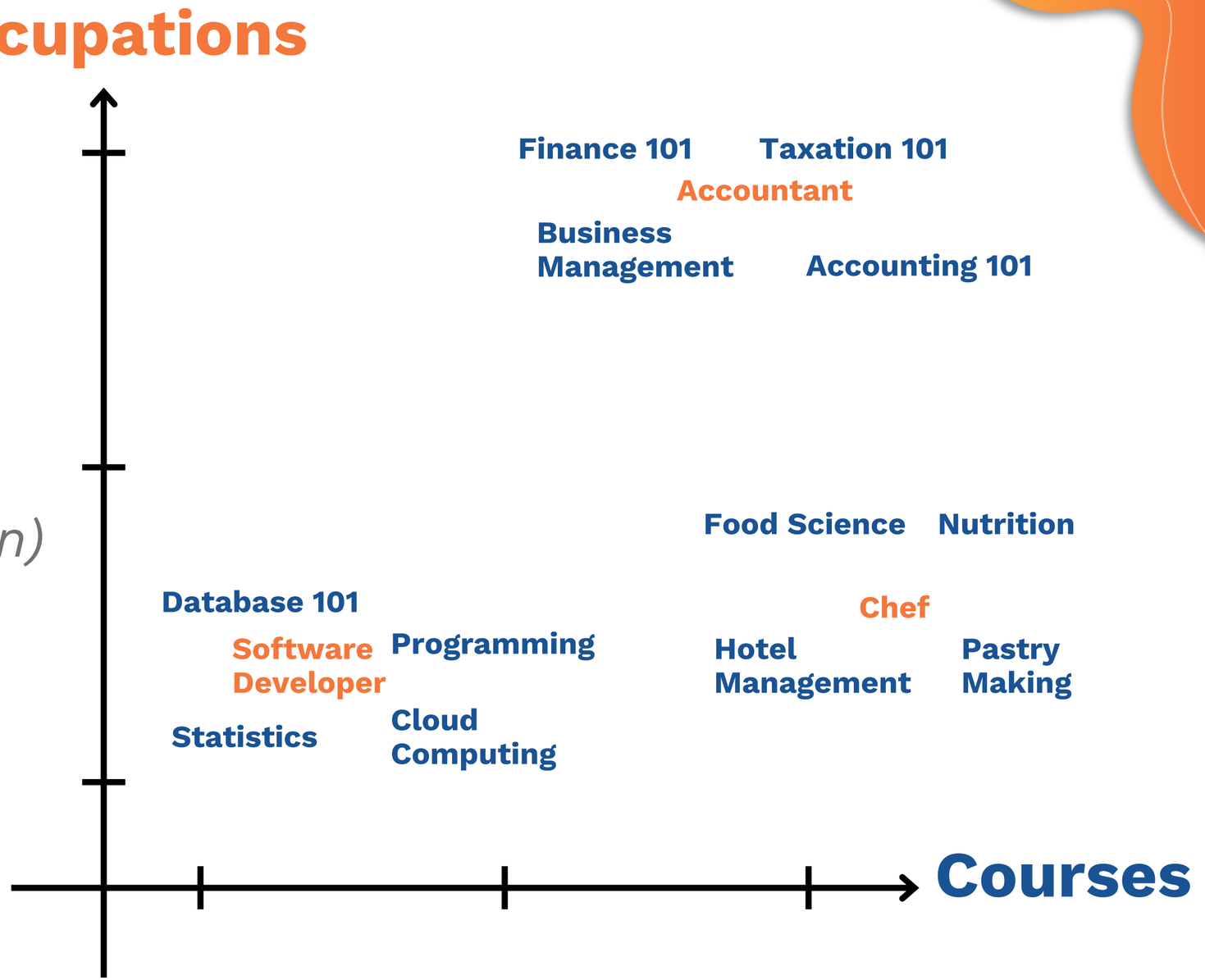
What if?

Find *Occupations* by *Courses*?

Bookkeeping Fundamentals (En)

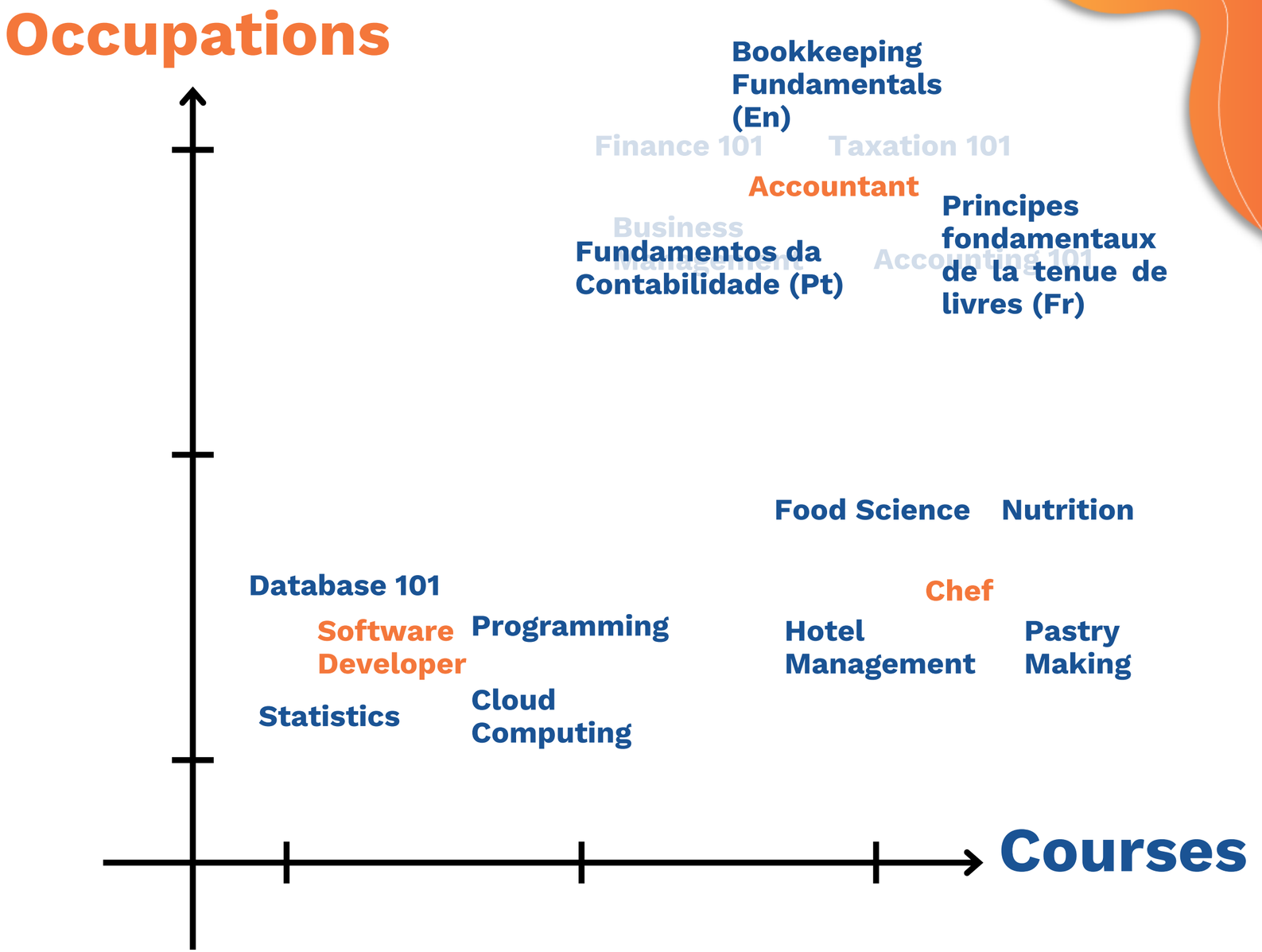
Principes fondamentaux de la tenue de livres (Fr)

Fundamentos da Contabilidade (Pt)



What if?

Find *Occupations* by *Courses*?

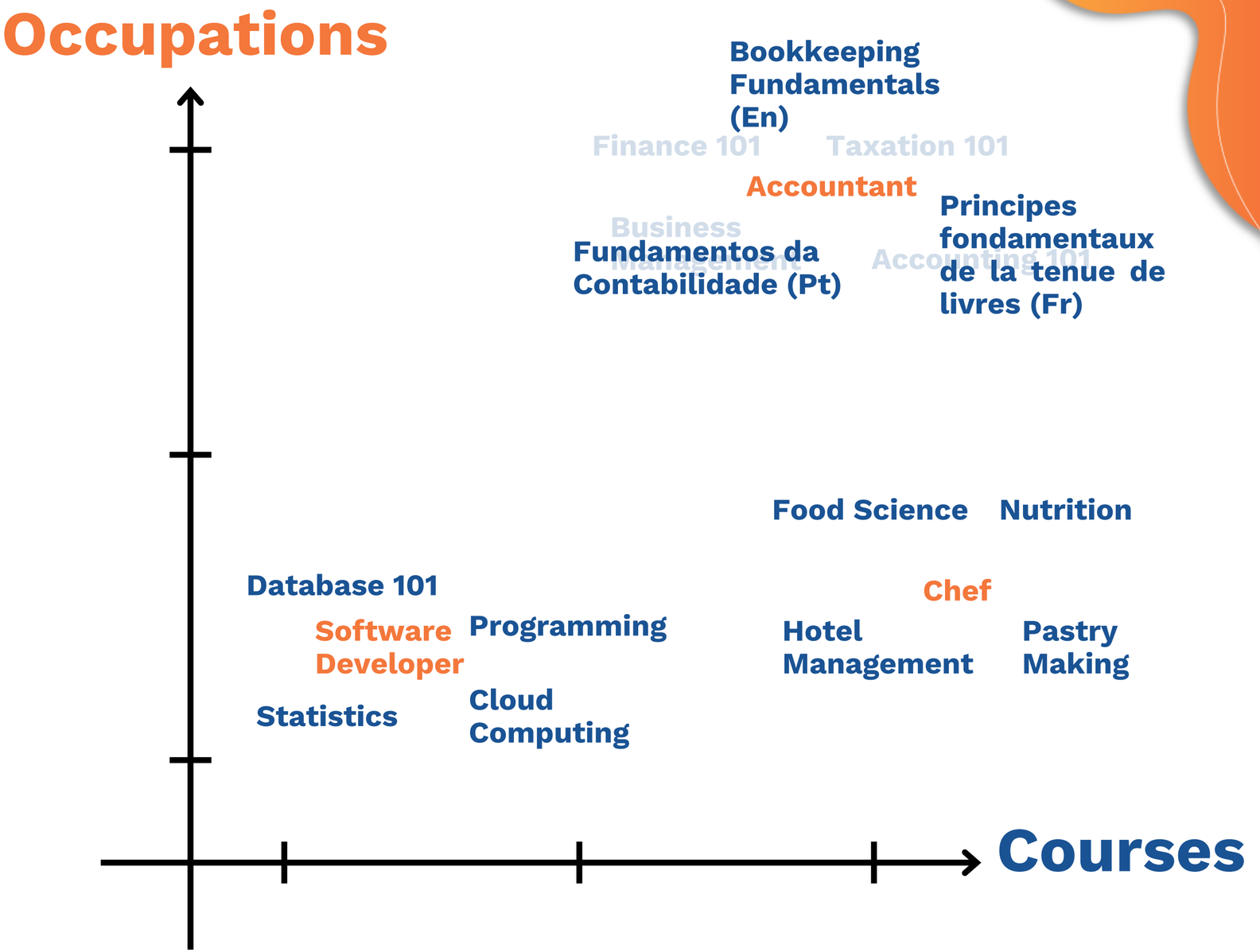


What if?

Find *Occupations* by *Courses*?

Suggested Occupation:

Accountant



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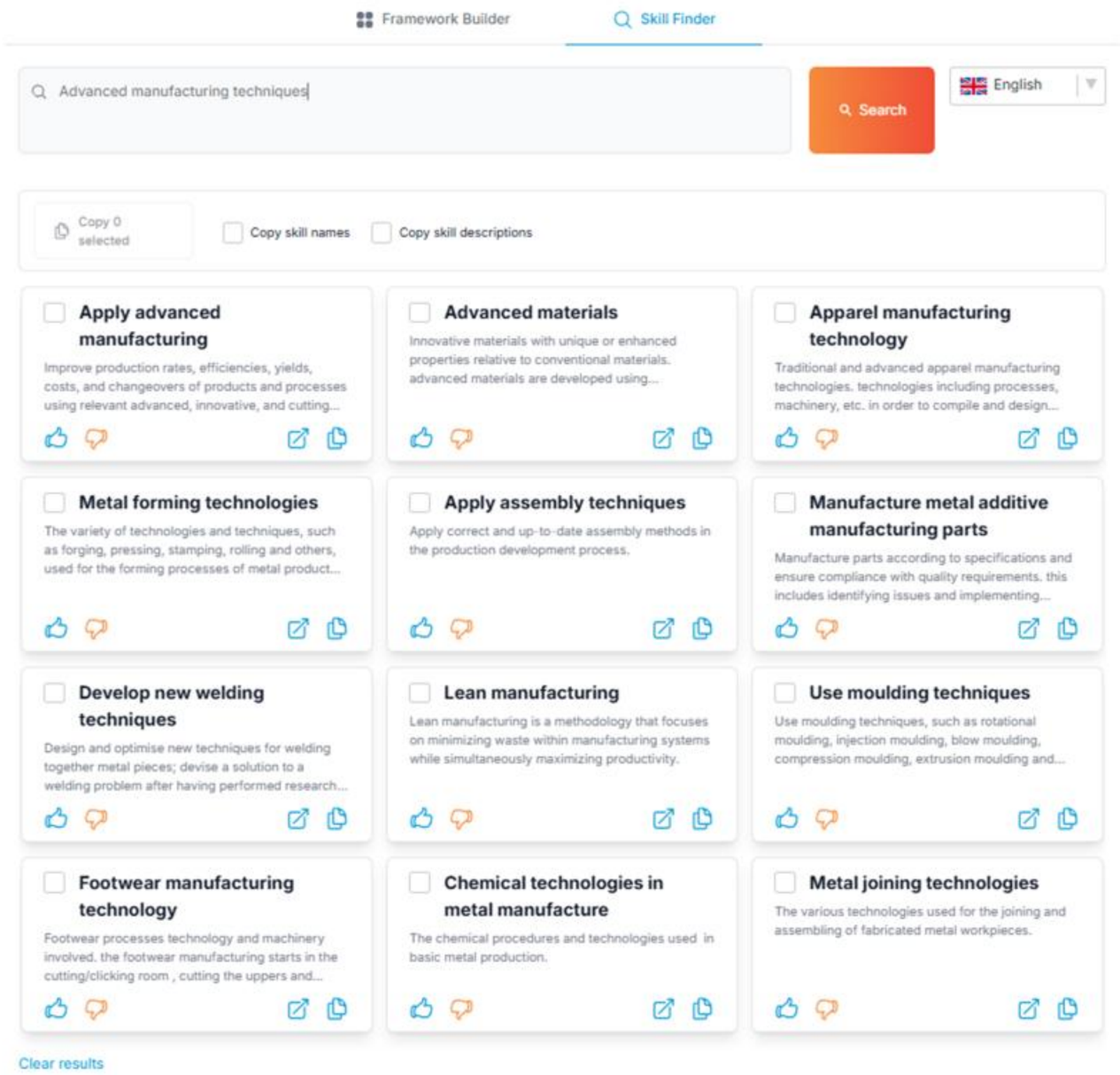
Can we find the *skill gaps* between a *candidate's abilities* and the *skills* needed for their *desired jobs* and suggest *relevant courses*?

Skill Finder



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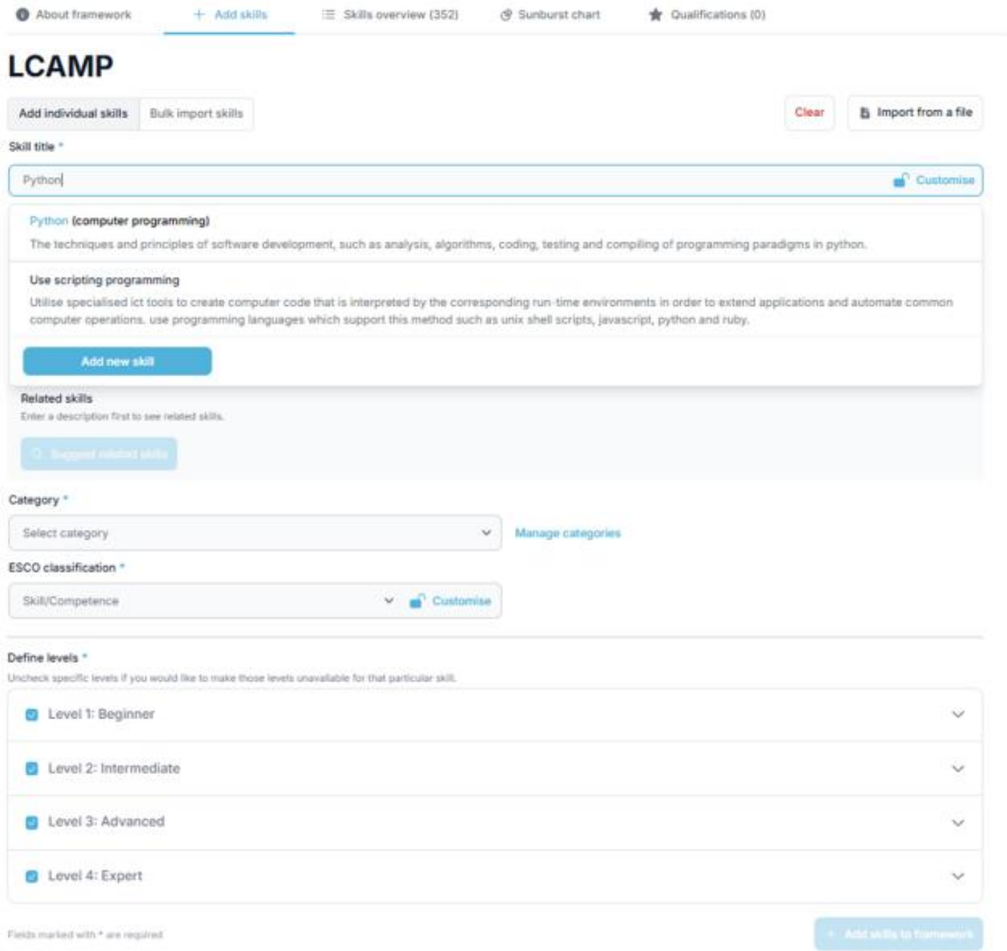
Organising skills in Custom Framework

- Search existing skills or add custom
- ESCO classification
- Define skill progression level (1 – 4)



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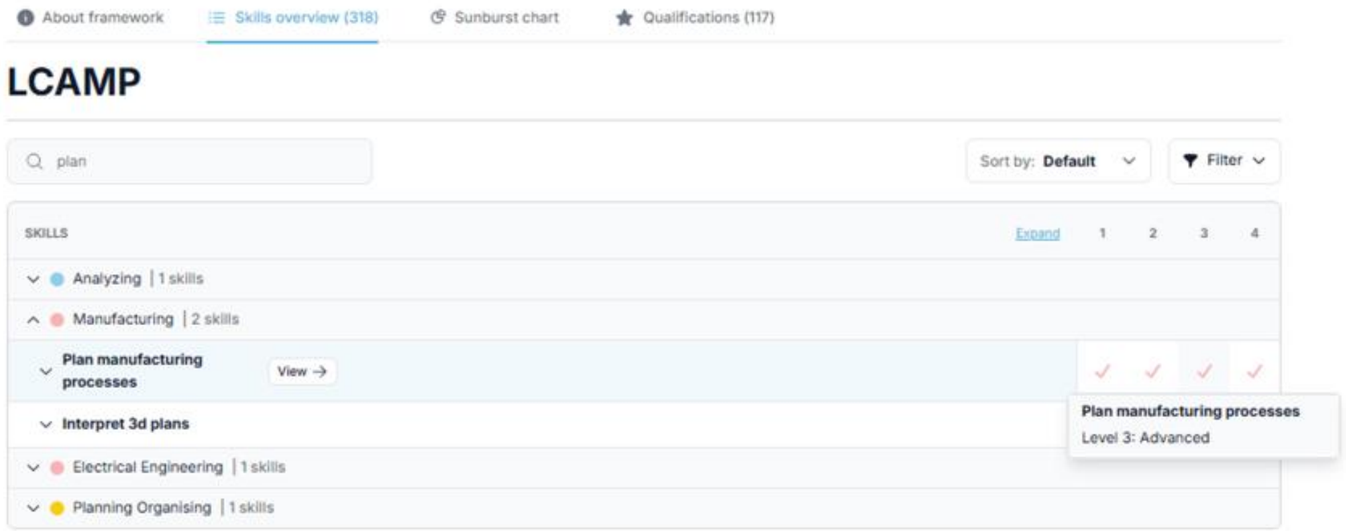
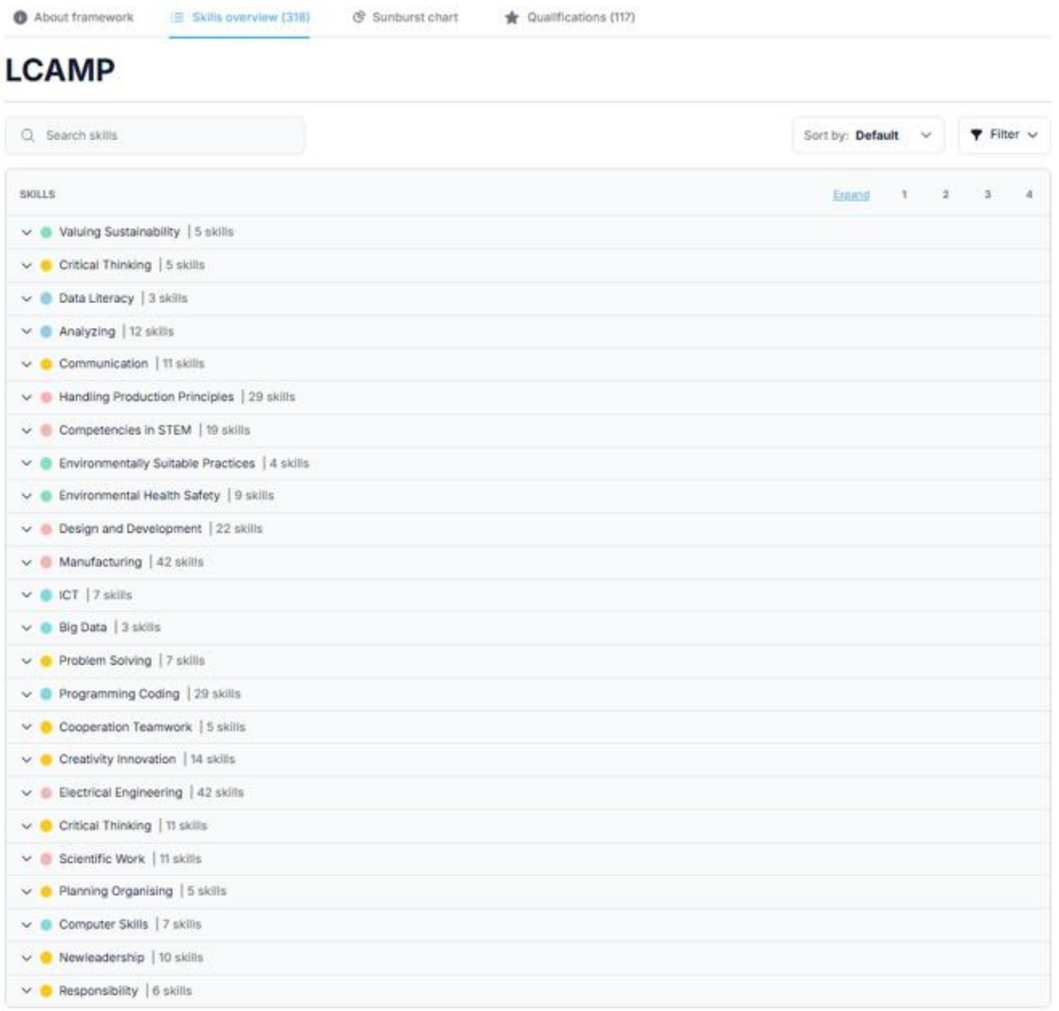
Skill progression

- Define skill progression level from lowest (1) to highest (up to 10)
- Skill proficiency defined by workload required to obtain the skill (ECT)



Example of a custom Skills Framework

- Custom skill categories
- Qualifications mapped to skills
- Machine-readable export
  (Rich Skill Descriptor)



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Example of a custom Skills Framework

← Return to category chart

Data Analysis

The ability to interpret data and derive actionable insights to support decisions

Category

Technical Proficiency

Source	ESCO classification
Custom	**Skill**

Level 3: Expert
0 hours of practical experience
Builds predictive models and communicates insights to influence strategy.

Level 2: Proficient
0 hours of practical experience
Analyzes trends and patterns to identify opportunities and challenges.

Level 1: Foundational
0 hours of practical experience
Sorts and visualizes data using basic tools and techniques.

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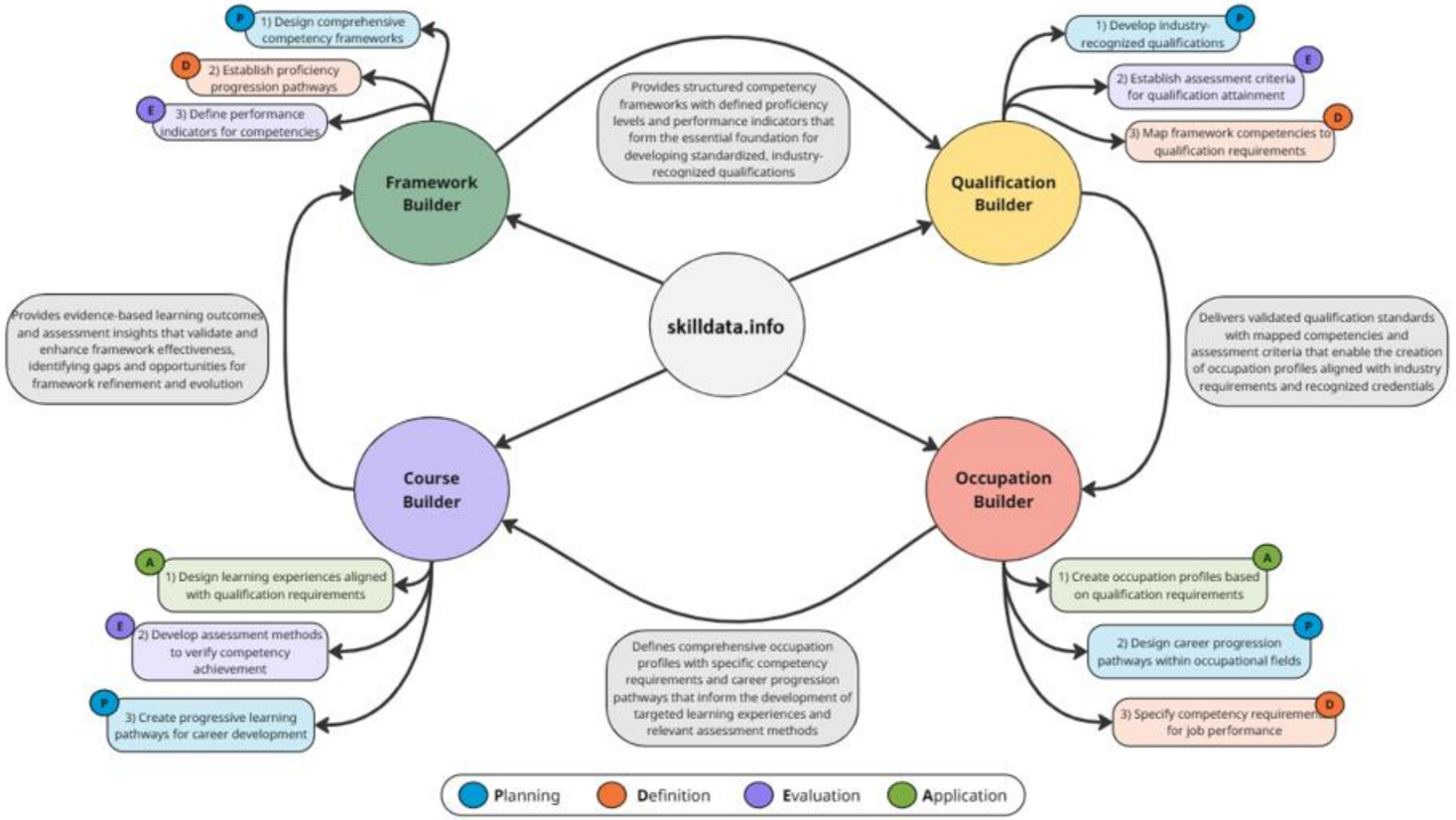
What’s next

- Job profile / occupation builder
- Course catalogue
- Skills gap analysis
  - import CV
  - self-assessment
- Career Recommendations



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