# How We Measure Skills



- **Knowledge**
  - The information needed to perform a task.
- **Tasks**
  - The smallest unit of work used in a business process.
- **Competence (Level)**
  - The combination of your knowledge, the skills you have acquired and how those combine into performance
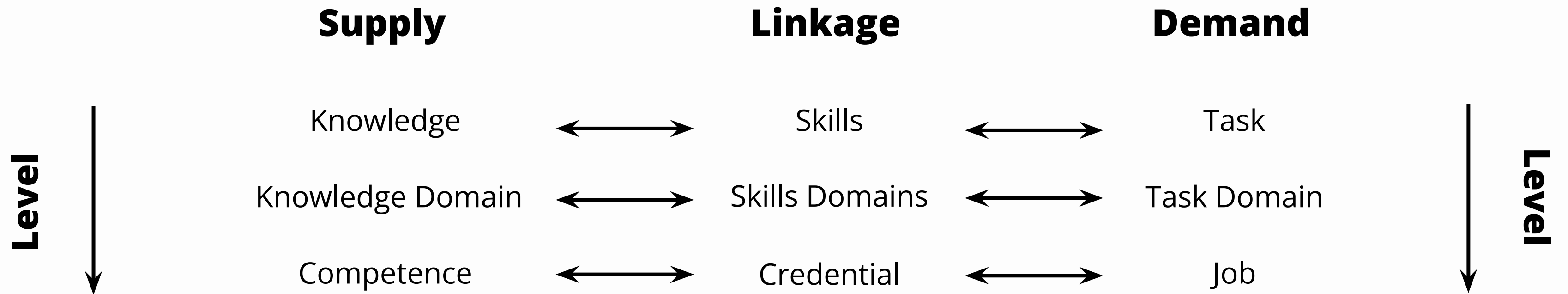
# Skill Development Cycle

are...

- Cyclic
  - Acquire knowledge to complete tasks
  - Operationalize knowledge into skills
  - Apply skills to complete tasks
- Develop over time
  - Non-static
  - Relational to knowledge and tasks
- Levels
  - Defined by the knowledge and tasks
  - Not linear



Knowledge

Skills

Tasks

# Conceptualizing Skills

We can also think skills as part of supply/demand model with a hierarchy.

| | Supply | Linkage | Demand | |
|---|---|---|---|---|
| **Level** ↓ | Knowledge | ← → Skills ← → | Task | **Level** ↓ |
| | Knowledge Domain | ← → Skills Domains ← → | Task Domain | |
| | Competence | ← → Credential ← → | Job | |

# Taxonomies

Skills are often described by taxonomies. Taxonomies seek to represent human skills with unique definitions. Some look to to represent all human skills while others are focused on certain sectors. No single taxonomy is complete but combining taxonomies can get us closer.
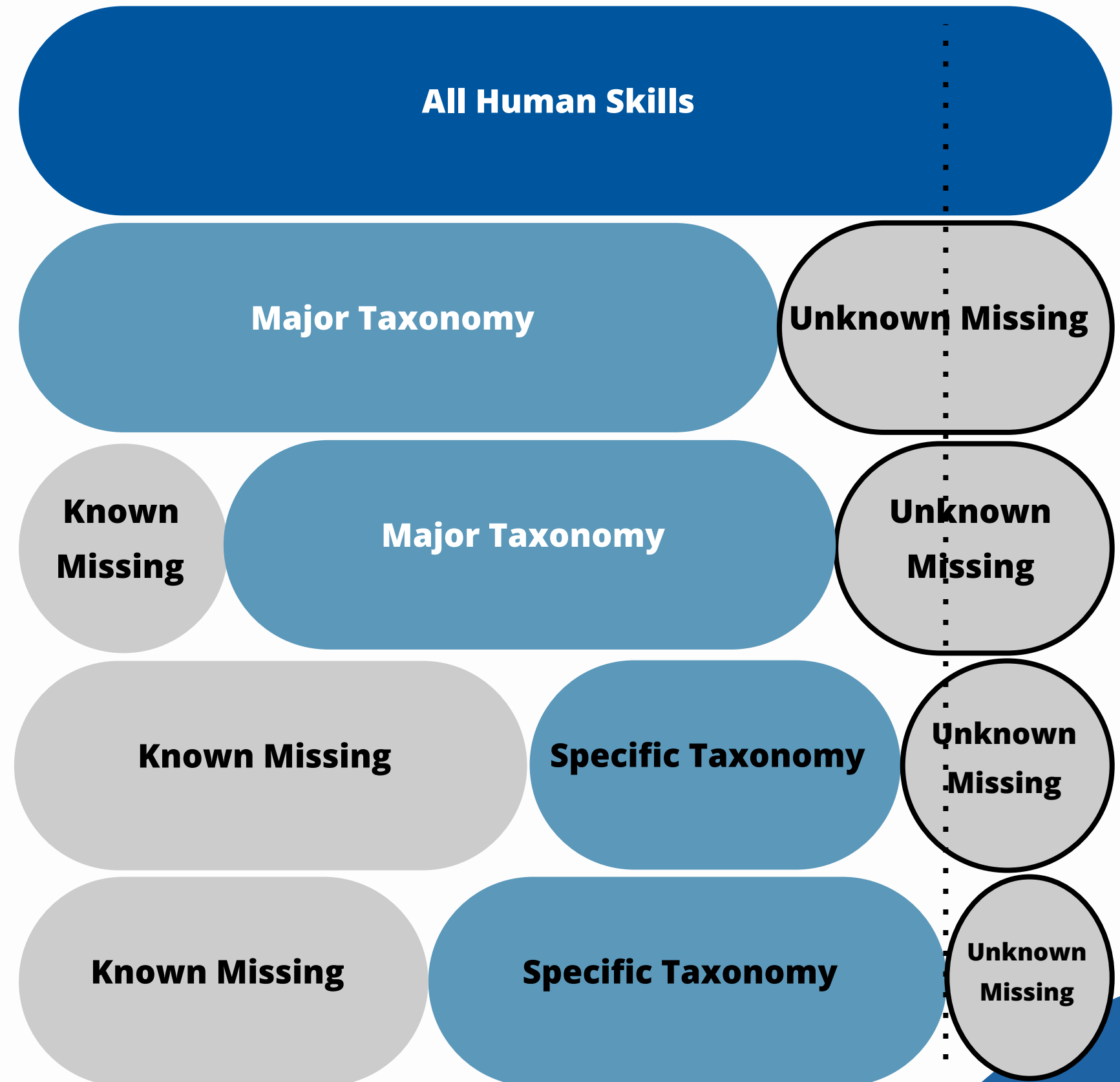
**4**

Major Taxonomies in the US

**3000+**

Skills Represented in US

**14**

Major Taxonomies Globally

**30,000+**

Skills Represented Globally

**All Human Skills**

Major Taxonomy

Unknown Missing

Known Missing

Major Taxonomy

Unknown Missing

Known Missing

Specific Taxonomy

Unknown Missing

Known Missing

Specific Taxonomy

Unknown Missing

# Building Taxonomies into Ontologies

- Ontologies are a way of showing the properties of a subject area and how they are related.

- Linking taxonomies allows us to build a skills ontology.

- *The relationships between taxonomies are as/more important than the skills represented.*

- But building Ontologies isn't easy...

  - Taxonomies change and update

  - Relationships are informed by data

  - New taxonomies = exponentially more

# Keys to Ontologies in Data

## ONTOLOGY LANGUAGE → ONTOLOGY → OBJECTS

**ONTOLOGY LANGUAGE**

- Defines what concepts the ontology can support, such as objects (classes), properties (attributes), and relationships (links)

- Contains logical primitives that allow for rules to be applied to ontological elements

**ONTOLOGY**

- Takes the ontology language and adds definitions to object classes, properties, and links

- Applies additional logic such as how objects can be created or deprecated or how property values can change

**OBJECTS**

- Maps the ontology definitions to actual data within the system

- Creates semantically meaningful containers for the enterprise to use

- Provides organizations with an instantiated object graph, including objects, properties, and links

Source:

Palantir.com

# A different framework for skills

Using our custom skills ontology we have built open source tools that extract and ingest real world education and workforce data to help define and enhance relationships between skills. With this process we can map skills and their relationships across datasets to create dynamic linkages using even sparse data.

# 3 Steps to LAiSER

LAiSER uses a three step process to link unstructured data across education and workforce domains. The process is based on the idea that the underlying nexus of skills is common across education and workforce uses and that repeated observations can help triangulate how individual skills relate to each other. The result is a map of skills across domains which allows for a common perspective on skills.

## Extract

Skills concepts are extracted from human readable text (syllabi, job postings, course materials) and aligned to the best representation across multiple taxonomies.

## Fit

These skills are then aligned with data from education, workforce, and level to triangulate the supply and demand characteristics of the concept.

## Map

Skills are then plotted on a three dimensional matrix to allow for the comparison between skills derived from multiple data sources.
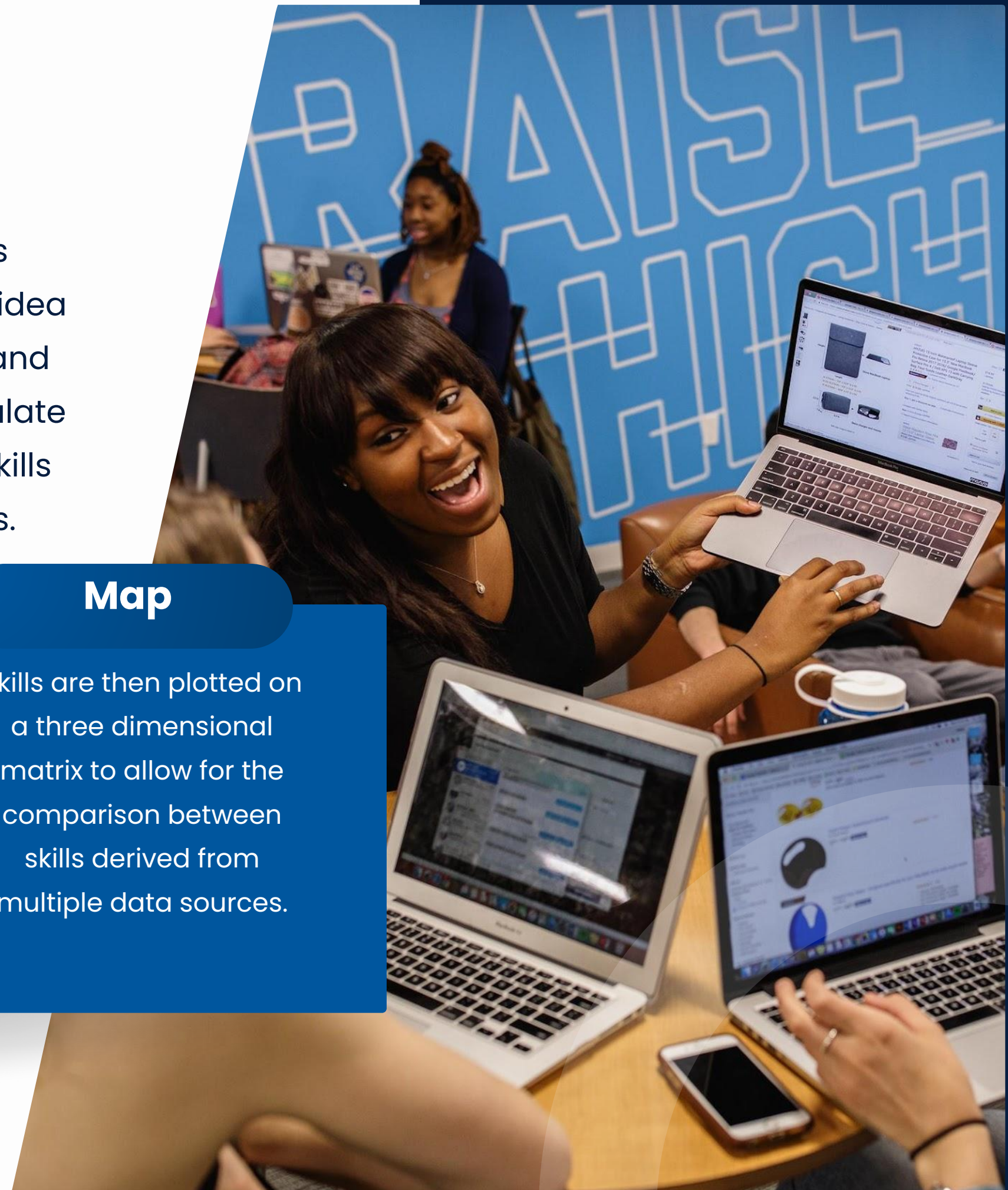
# Example

A software company is interested in hiring a programmer with coding experience. The hiring manager wants to compare a candidate's resume to the job description using skills mapping.
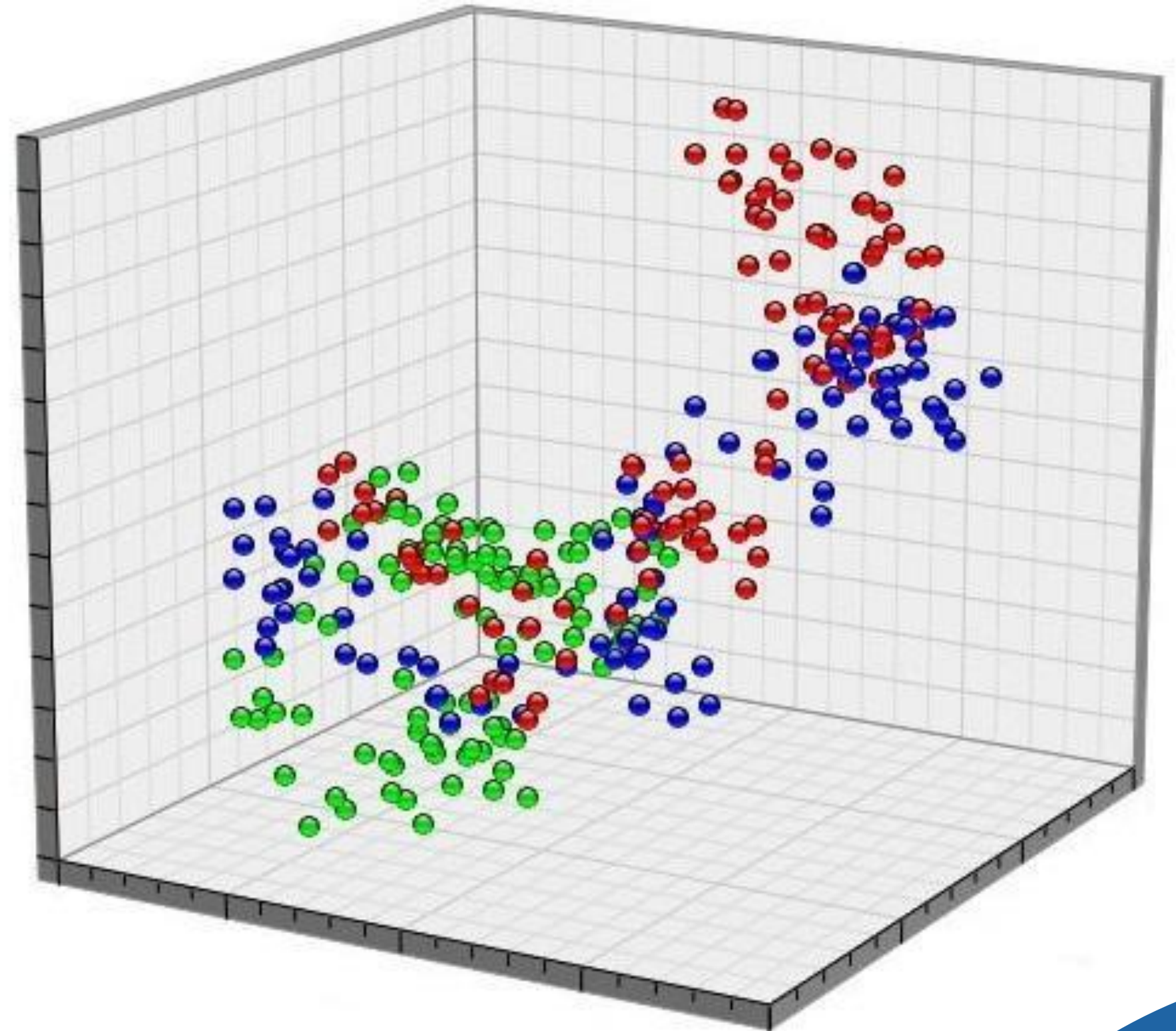
**Red** — Job Description Skills

**Green** — Work Experience (2yr Programming)

**Blue** — Education (BA in CS)

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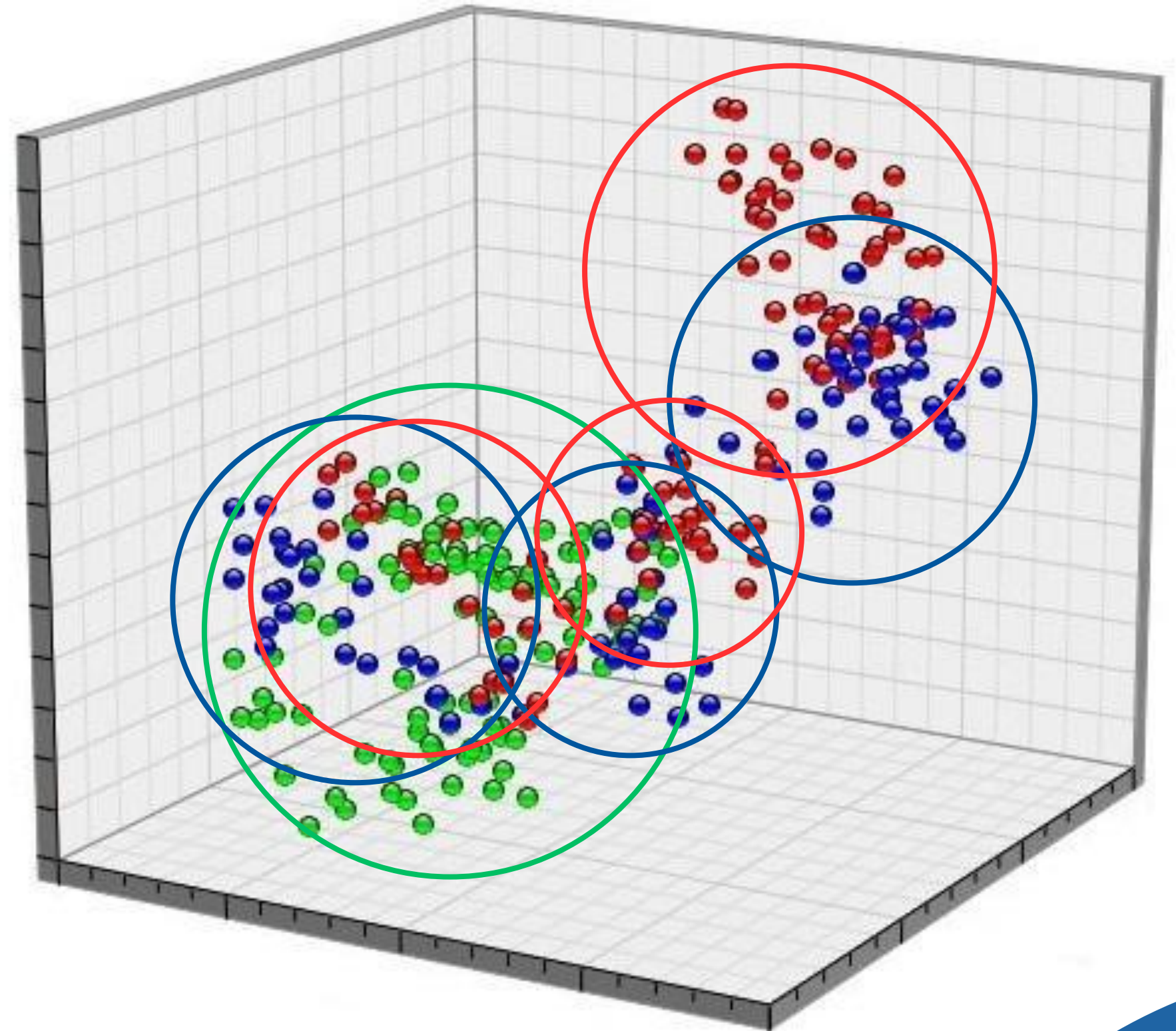
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# THANK YOU

Questions?

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