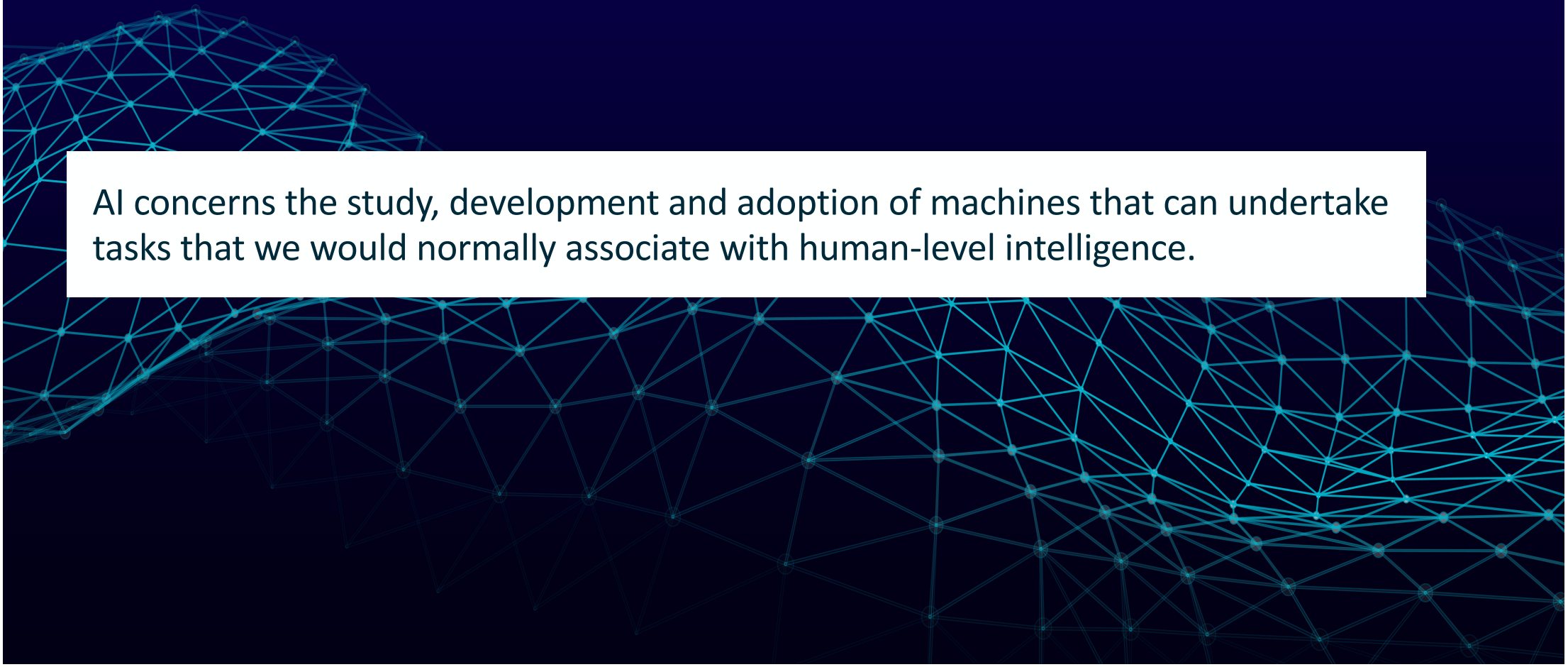
Introducing yourselves

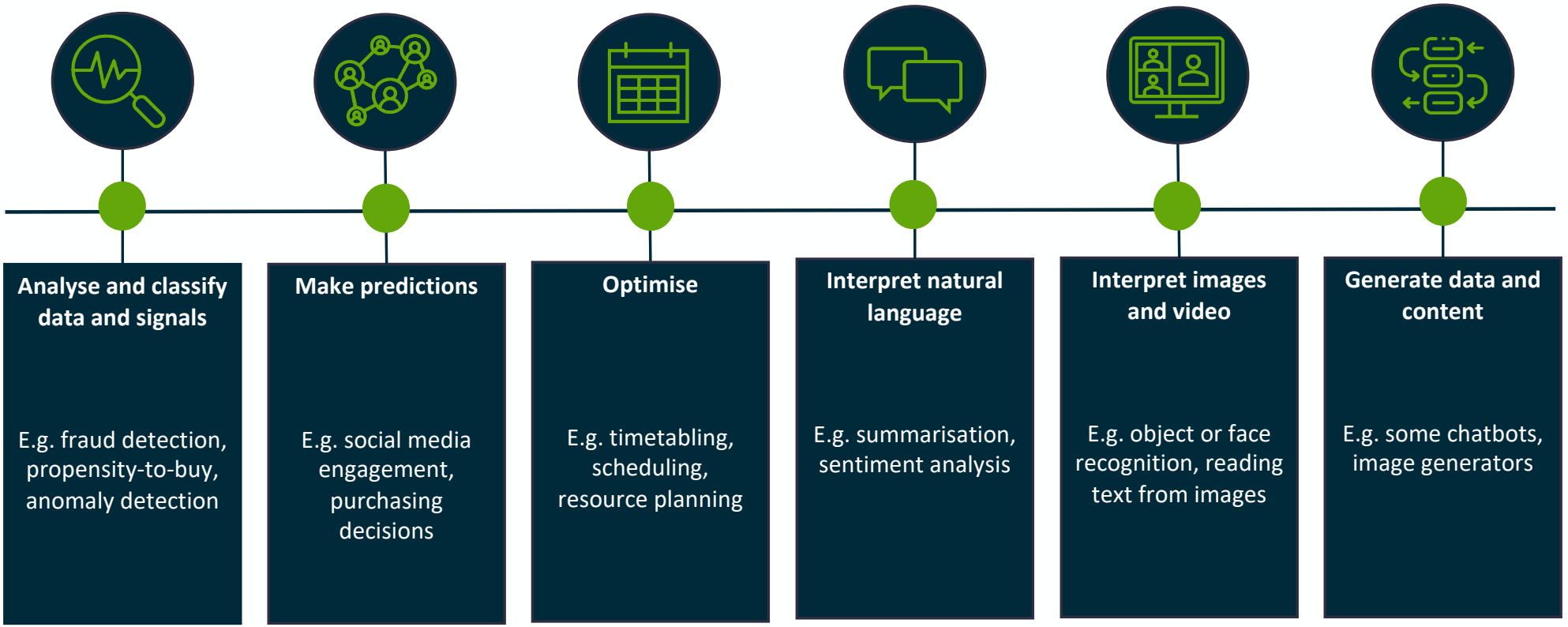
- Name and role
- What examples of AI do you use day-to-day?
- What excites you about AI?
- What concerns do you have?

What do we mean by AI?

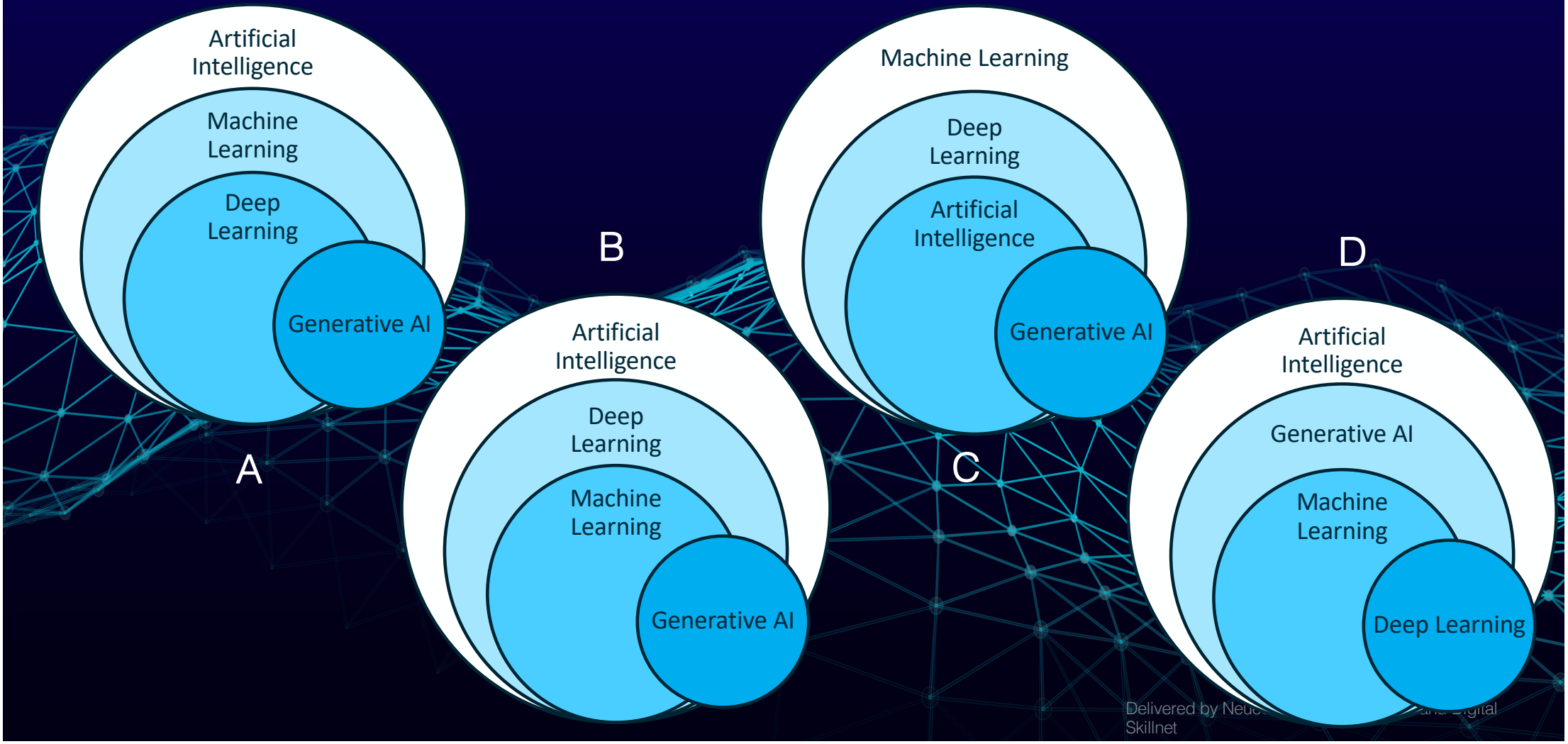


AI concerns the study, development and adoption of machines that can undertake tasks that we would normally associate with human-level intelligence.

What AI can do



Quiz question 1 – Which is these diagrams is correct?



Quiz question 2 – When developing an AI model, why is it important to split the data into “training” and “testing” sets?

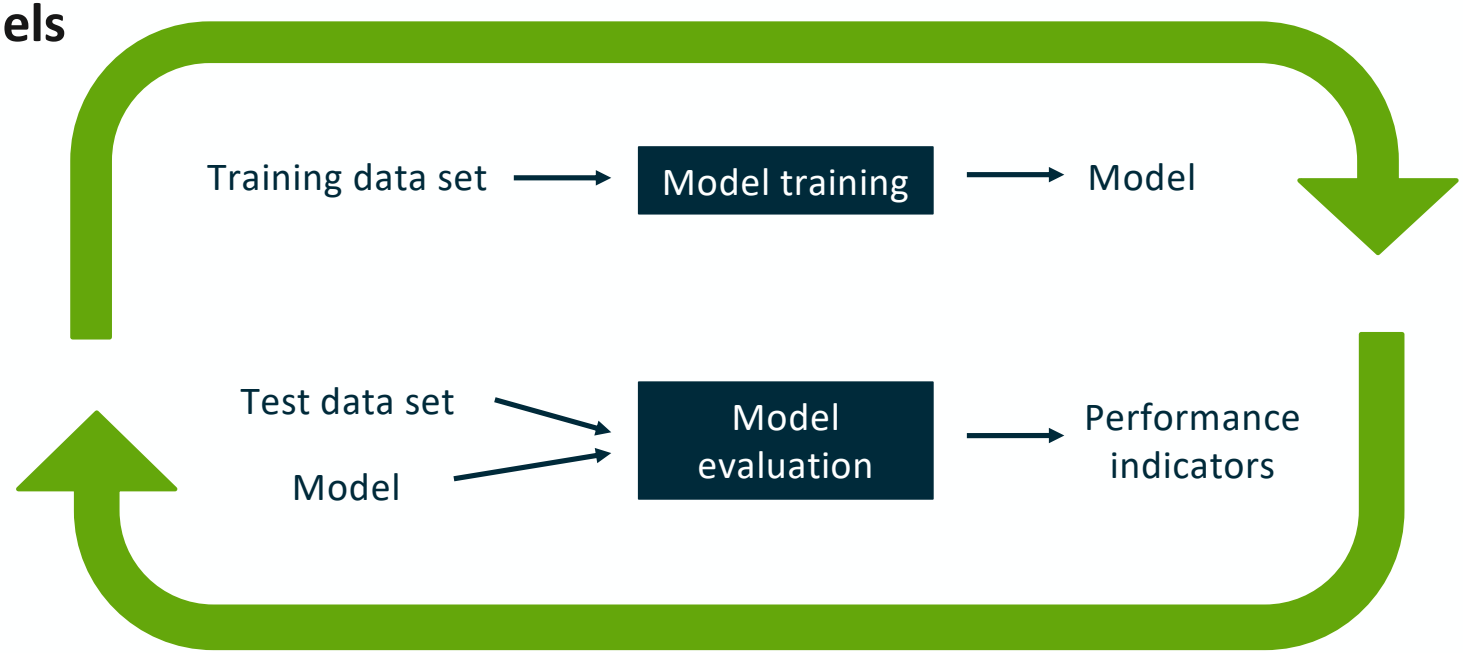
A: To make the model run faster during training?

B: To ensure the model can fetch all the data in one go?

C: To gauge potential model performance?

D: To reduce the amount of data the model needs to learn from?

Deriving AI models



Numerical data

Variable	Sample	Observed value	Mean	Standard deviation	Minimum	Maximum
	Full sample	12,210	0.1036	0.1298	1.48E-06	0.9070
Fin	High financing constraints	6105	0.1108	0.1367	2.55E-06	0.8997
	Low financing constraints	6105	0.0964	0.1221	1.48E-06	0.9070
	Full sample	12,210	0.0481	0.0673	0	0.8153
Rd	High financing constraints	6105	0.0452	0.0499	0	0.6827
	Low financing constraints	6105	0.0511	0.0809	0	0.8153
	Full sample	12,210	0.0454	0.0721	-0.5655	0.5526
CFO	High financing constraints	6105	0.0432	0.0734	-0.5655	0.5526
	Low financing constraints	6105	0.0477	0.0708	-0.4023	0.4886
	Full sample	12,210	22.5514	1.3566	19.0251	28.6365
Lnsize	High financing constraints	6105	21.4935	0.5977	19.0251	22.3735
	Low financing constraints	6105	23.6092	1.0418	22.3736	28.6365
	Full sample	12,210	0.2201	0.1737	0.0002	0.9709
Fixed	High financing constraints	6105	0.2039	0.1458	0.0002	0.9709
	Low financing constraints	6105	0.2363	0.1963	0.0002	0.9542
	Full sample	12,210	2.9163	0.3169	0	4.2485
Lnage	High financing constraints	6105	2.8668	0.3118	0	4.2047
	Low financing constraints	6105	2.9657	0.3143	1.0986	4.2485
	Full sample	12,210	0.4634	0.2152	0.0071	5.6808
Lev	High financing constraints	6105	0.3732	0.2117	0.0071	5.6808
	Low financing constraints	6105	0.5536	0.1776	0.0075	2.2901
	Full sample	12,210	0.0364	0.1055	-7.7001	0.4690
Roa	High financing constraints	6105	0.0354	0.1375	-7.7001	0.4690
	Low financing constraints	6105	0.0374	0.0581	-2.0710	0.38400
	Full sample	12,210	56.1158	15.6887	11.1900	100.0100
Shrcr	High financing constraints	6105	52.9209	14.7383	11.1900	100.0100

Enterprise financialization and R&D innovation: A case study of listed companies in China - Scientific Figure on ResearchGate.

Categorical data

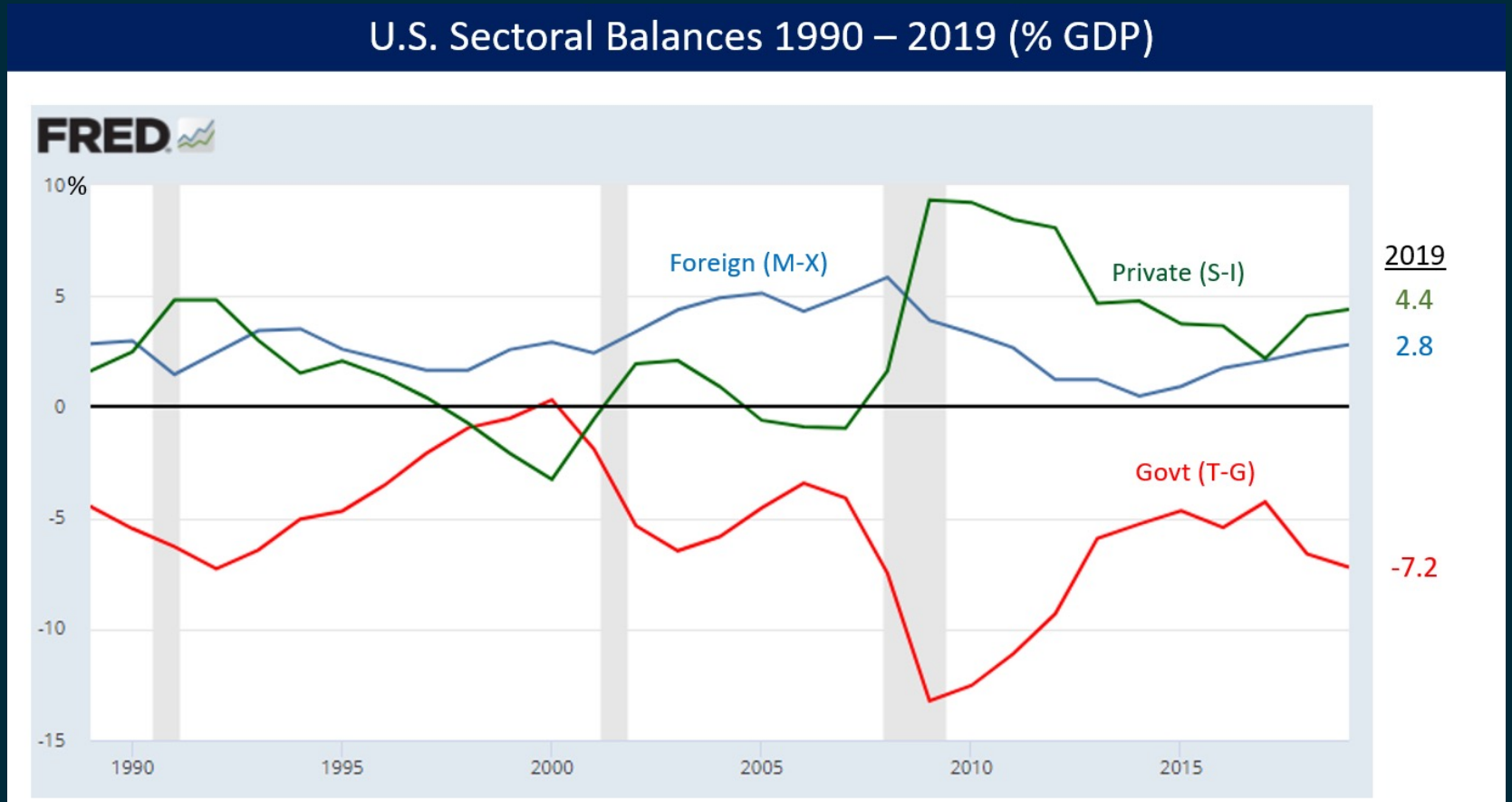
Data Preview: CRM Sales Opportunities

Accounts | Products | Sales Teams | Sales Pipeline | CRM Data Dictionary

account	sector	year_established	revenue	employees	office_location	subsidiary_of
Acme Corporation	technolgy	1996	1100.04	2822	United States	
Betasoloin	medical	1999	251.41	495	United States	
Betatech	medical	1986	647.18	1185	Kenya	
Bioholding	medical	2012	587.34	1356	Philipines	
Bioplex	medical	1991	326.82	1016	United States	
Blackzim	retail	2009	497.11	1588	United States	
Bluth Company	technolgy	1993	1242.32	3027	United States	Acme Corporation
Bubba Gump	software	2002	987.39	2253	United States	
Cancity	retail	2001	718.62	2448	United States	
Cheers	entertainment	1993	4269.9	6472	United States	Massive Dynamic

Rows per page: 10 1-10 of 86

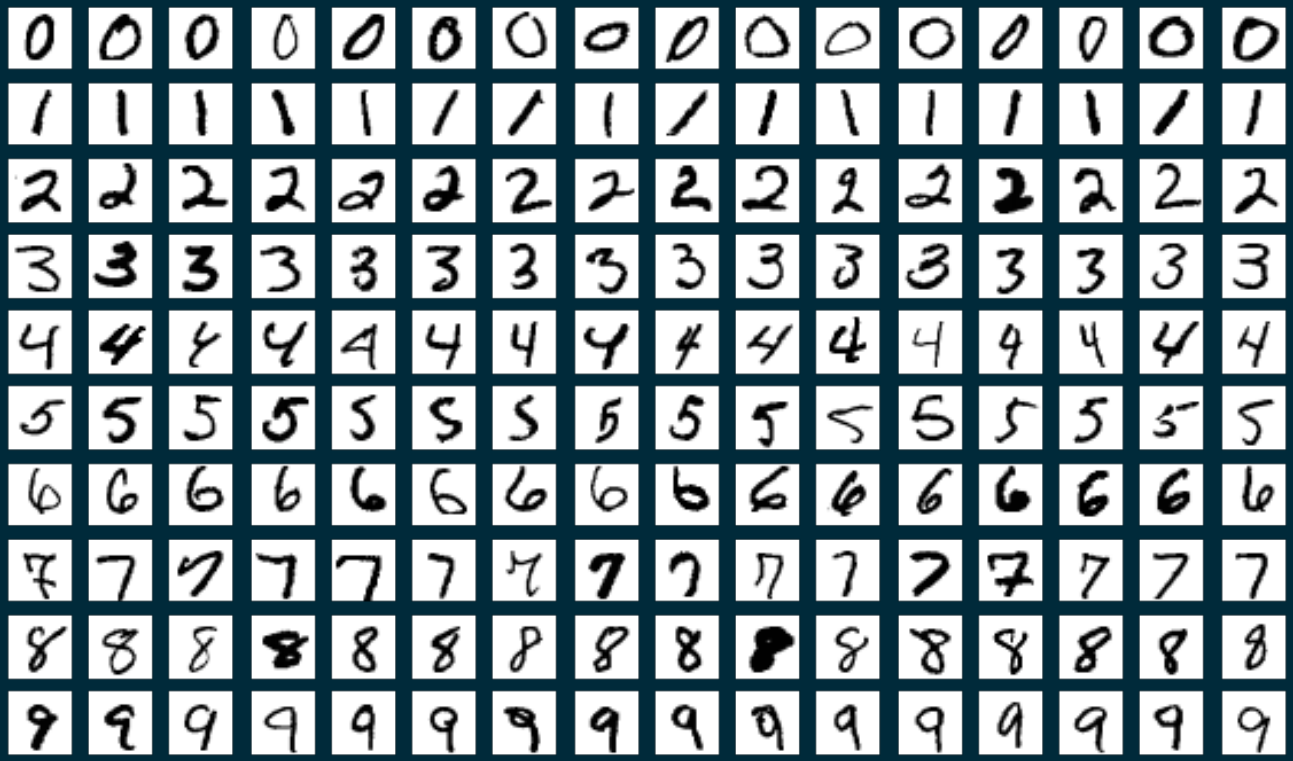
Time series data

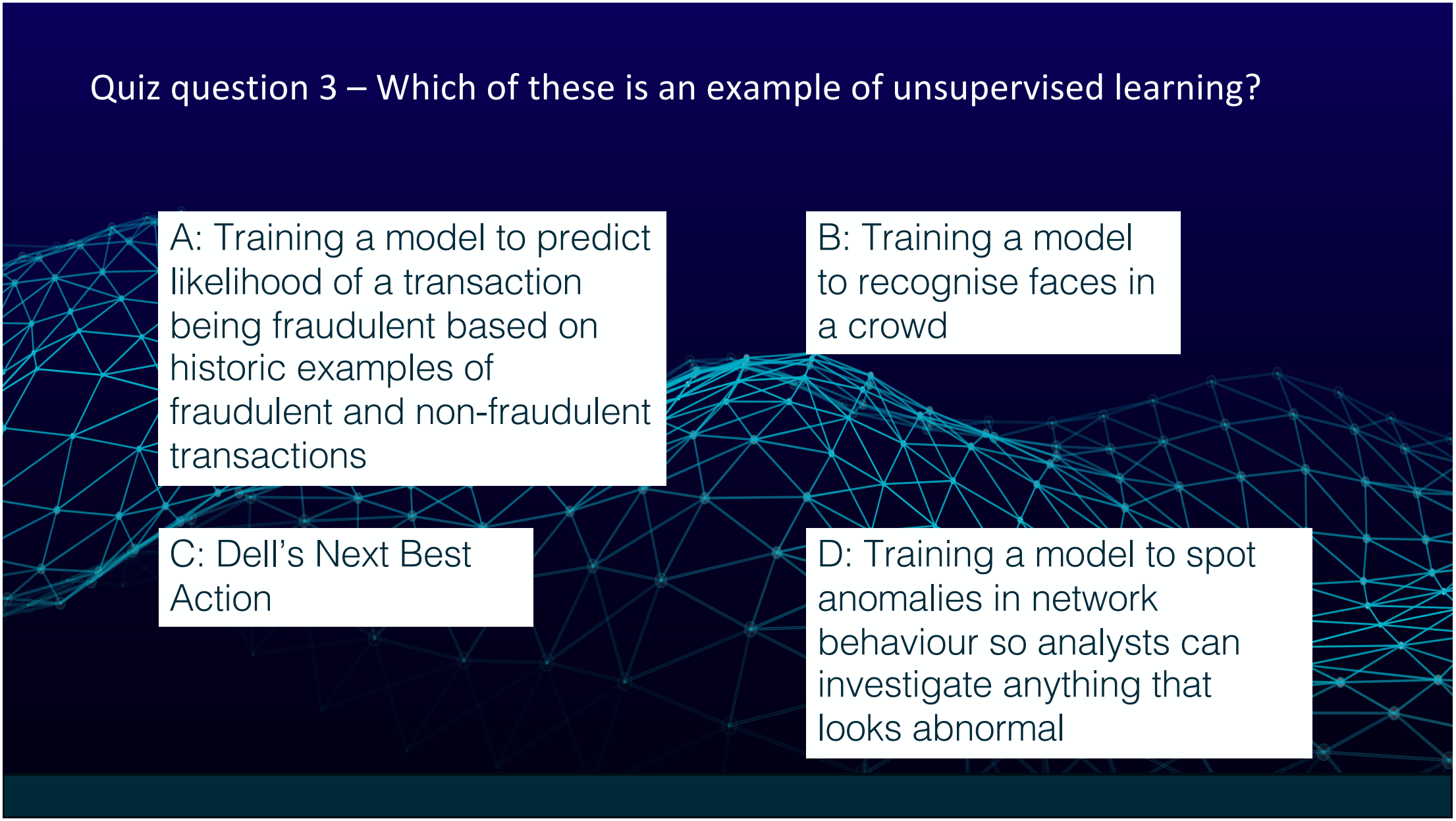


Textual data

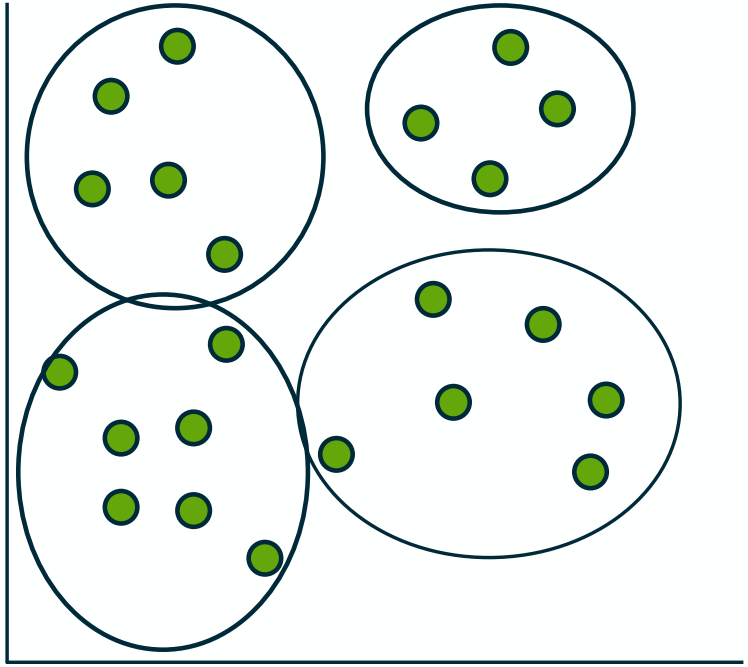
Email Text	Email Type
Dear Jordan, your subscription has been successfully renewed. Thank you for your continued support.	Safe Email
Dear Casey, thank you for your purchase. Your order will be shipped soon.	Safe Email
Congratulations! You've won a $3000 gift card. Click here to claim your prize.	Phishing Email
You have a new secure message from your bank. Click here to read it.	Phishing Email
Your package delivery is pending. Please provide your personal information to confirm delivery.	Phishing Email
Hi Drew, it was great meeting you at the conference. Let's catch up for coffee next week.	Safe Email
Your package delivery is pending. Please provide your personal information to confirm delivery.	Phishing Email
Hi Alex, it was great meeting you at the conference. Let's catch up for coffee next week.	Safe Email
Alert: Unusual login attempt detected. Verify your account by clicking here.	Phishing Email
Your subscription is about to expire. Renew now to continue enjoying our services.	Phishing Email
Hello Alex, here is your weekly update on the project's progress. Please review and provide feedback.	Safe Email
Your subscription is about to expire. Renew now to continue enjoying our services.	Phishing Email

Image data

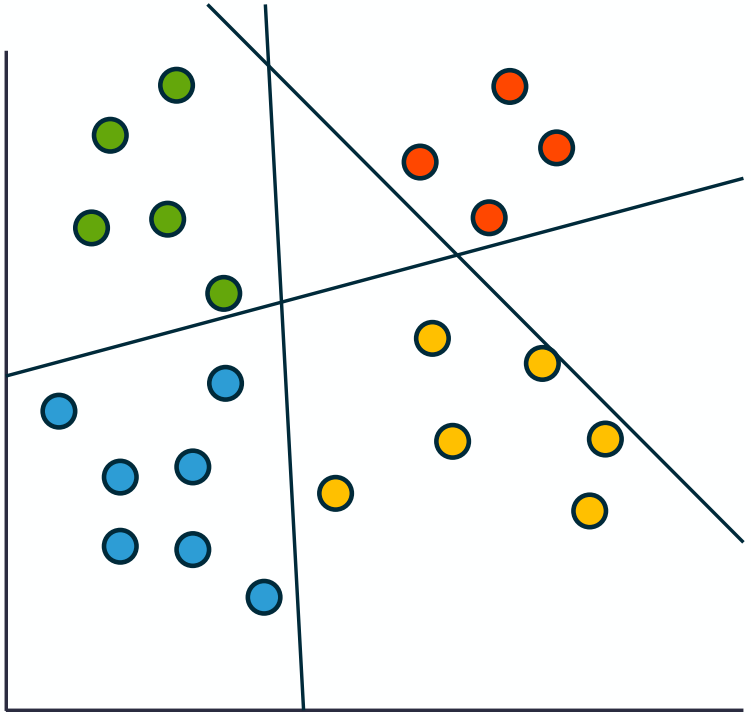



Quiz question 3 – Which of these is an example of unsupervised learning?
A: Training a model to predict likelihood of a transaction being fraudulent based on historic examples of fraudulent and non-fraudulent transactions
B: Training a model to recognise faces in a crowd
C: Dell's Next Best Action
D: Training a model to spot anomalies in network behaviour so analysts can investigate anything that looks abnormal

Supervised and unsupervised learning

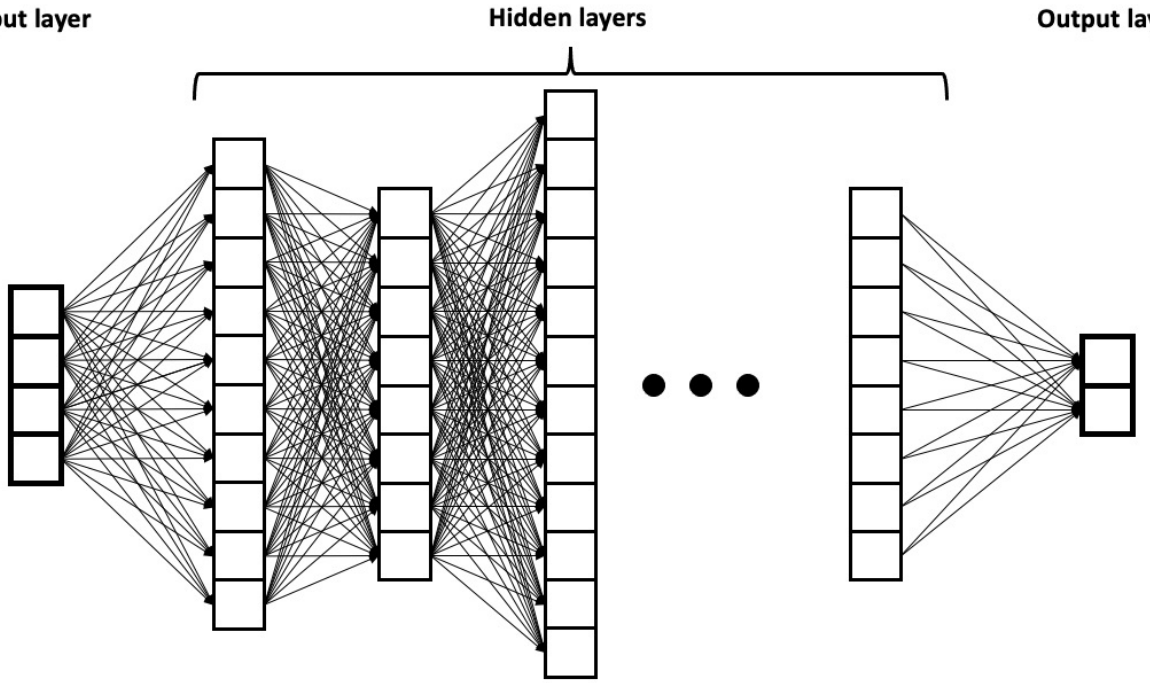


There is a known set of classes and training data is labelled accordingly



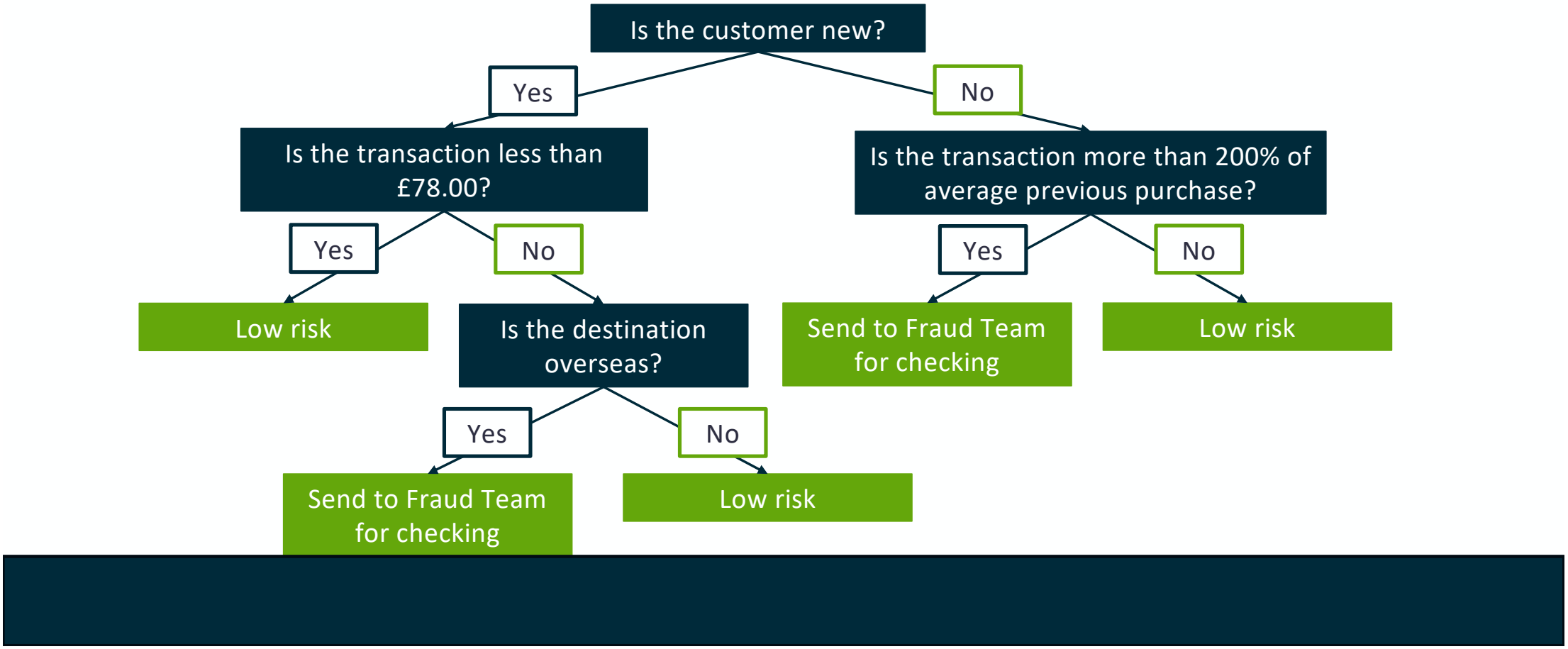
Number of classes is unknown at start, and training data is not labelled

Neural networks / deep learning

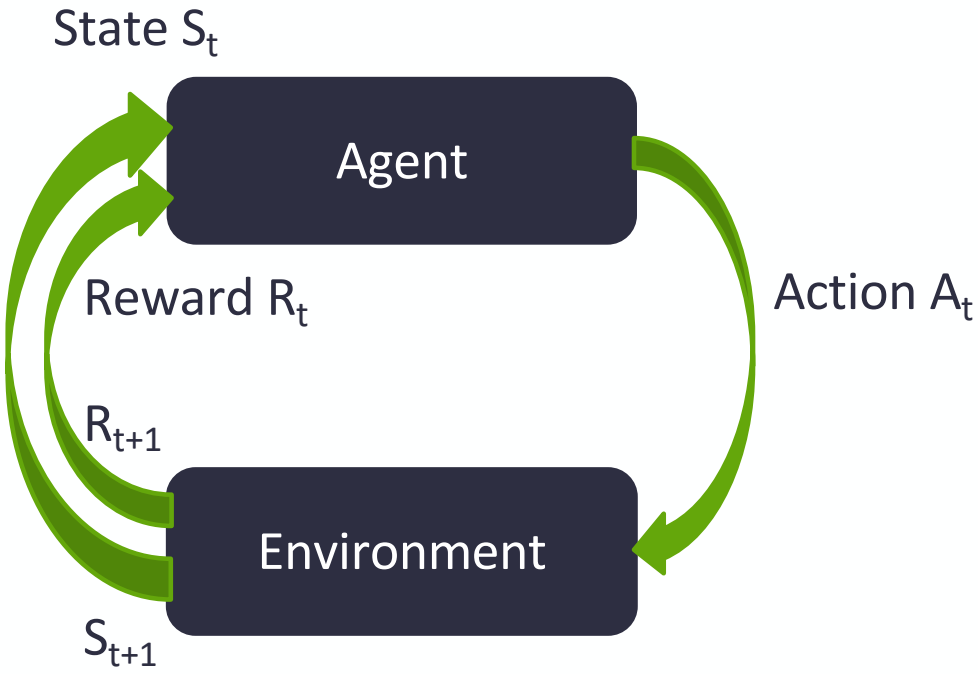


Decision trees

Is this transaction likely to be fraudulent?



Reinforcement learning



Choose the right AI for the job

AI approaches differ in terms of:

- What they can do – describe, predict, optimise, generate
- The quantity and quality of data required
- Performance in terms of accuracy and speed
- Ability to incorporate domain knowledge
- Interpretability
- Compute and storage requirements

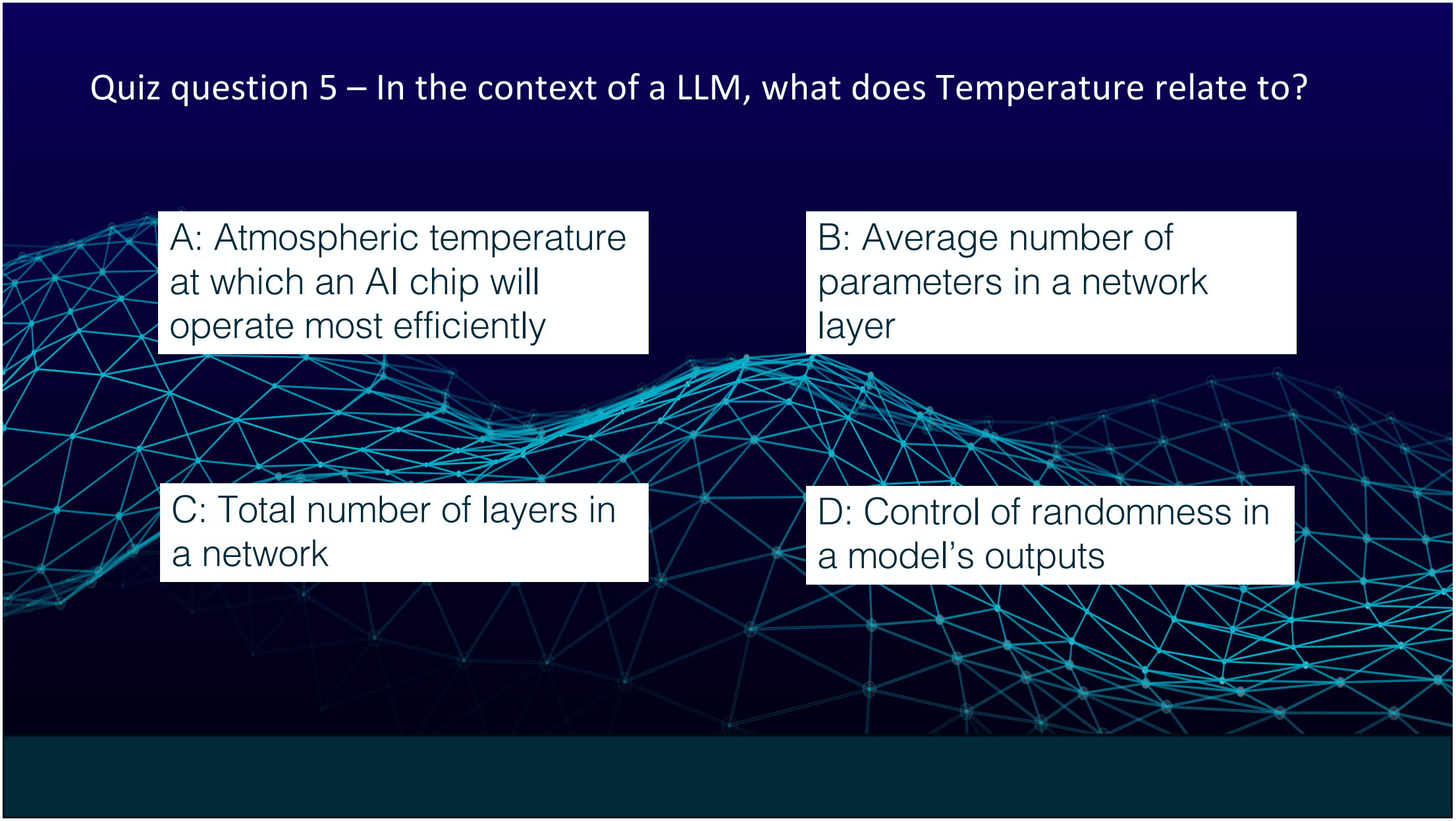
Quiz question 4 – What is a ‘Foundational Model’?

A: A small AI model used for basic tasks?

B: A large, general-purpose AI model training on vast amounts of data and adaptable to many tasks?

C: A model that can interpret natural language to respond to prompts?

D: A model for generating other AI models?

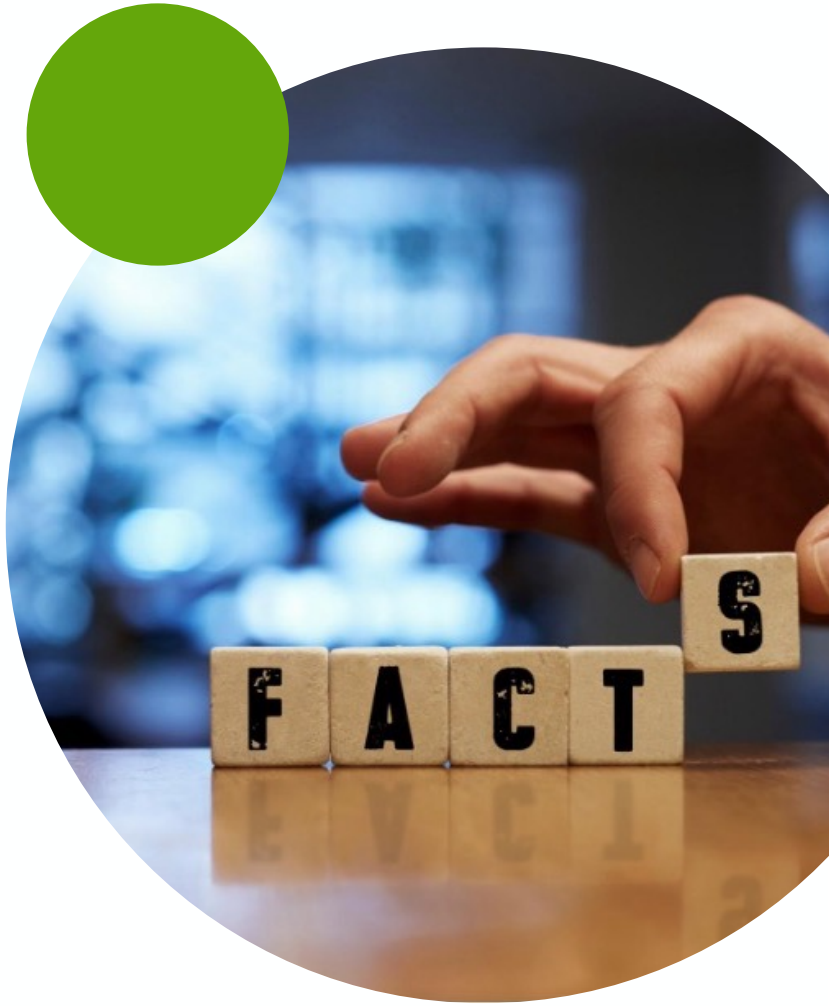

Quiz question 5 – In the context of a LLM, what does Temperature relate to?
A: Atmospheric temperature at which an AI chip will operate most efficiently
B: Average number of parameters in a network layer
C: Total number of layers in a network
D: Control of randomness in a model's outputs

Foundation models

- A foundation model is trained on a vast amount of data – potentially has millions or billions of parameters
- A Large Language Model is a type of foundation model designed to interpret and respond to natural language
- Can be considered general-purpose
- Can be applied and fine-tuned to specific application domains or tasks as needed
- Foundation models can enable:
  - Visual comprehension
  - Text-to-image
  - Code generation
- Can be uni-modal or multi-modal

Using your local context with LLMs

- LLMs are powerful but they can only learn patterns from the data provided to them
- Errors in that data can lead to LLM responses that sound plausible but are inaccurate and/or misleading
  - ‘Hallucinations’
  - Legal cases, Air Canada…
- Retrieval Augmented Generation (RAG)
  - LLM is pointed towards a database provided by the user or organization so responses can be drawn from a trusted source



Quiz question 6 – What are essential features of agentic AI?

A: Ability to have material interactions with its environment to achieve one or more goals?

B: Ability to keep track of its state over time, and to learn and adapt?

C: Ability to act autonomously – with no human intervention?

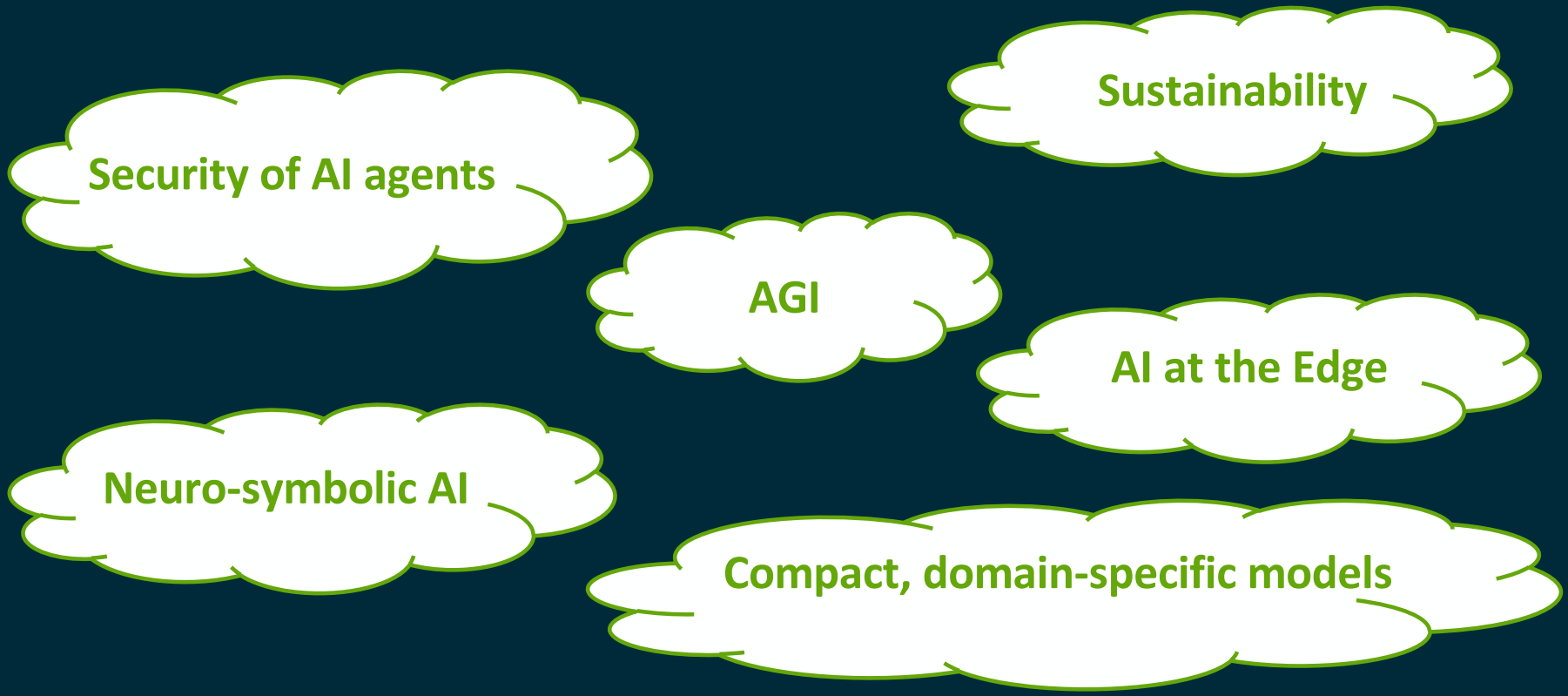
D: We don't really know - there is no agreed definition?

Agents vs Agentic AI

Agent: “handle incoming queries about our newest product”

Agentic AI: “run my sales and marketing function”

Emerging trends and topics



Question to whole group

- What are some of main risks or issues to consider when developing or deploying AI?