# Why Linear Algebra is Important in AI

- **Data Representation:** Vectors and matrices represent data in machine learning, such as images, text, or tabular data.

- **Model Operations:** Operations on data, like matrix multiplication, are used extensively in neural networks.

- **Dimensionality Reduction:** Techniques like PCA and SVD, based on linear algebra, help reduce the complexity of large datasets.

- **Optimization:** Understanding gradients and transformations (e.g., backpropagation in deep learning) relies on linear algebra concepts.
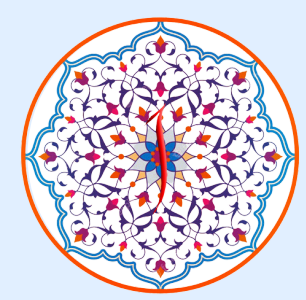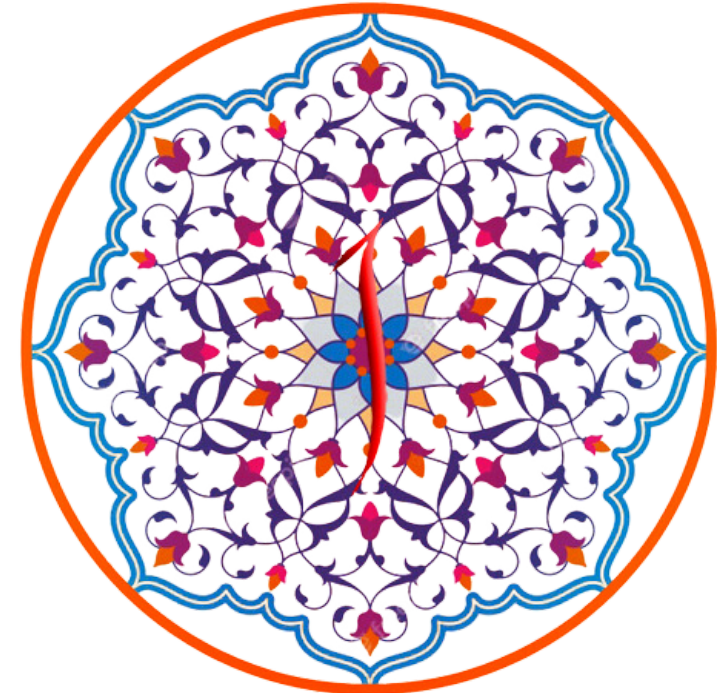
With these examples, freshers can begin to see how linear algebra connects to the mathematics of AI models and algorithms.