# Deep Learning (IST, 2021-22)

# Practical 11: Word Embeddings and Large Pretrained Models

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## Question 1

Look at the **Part I** practical notebook for the implementation of this question.

In this question you are going to solve some analogy questions using static word embeddings.

1. Download pre-trained GloVe vectors (see the notebook for instructions):
2. Explore analogies using vector arithmetic. Provide top-5 closest vectors to each analogy:

   Hint: to achieve that we convert analogies using the following vector arithmetic: To estimate the response for "Man is to king, what woman is to —": we convert it to **emb**('king') – **emb**('man') + **emb**('woman') , where **emb**() is the embedding vector of a given word.

   Check the following:

   - "Japan is to Japanese, what China is to —"
   - "Moscow is to Russia, what Paris is to —"
   - "King is to man, what queen is to —"
   - "Cat is to kitten, what dog is to —"

## Question 2

Look at the **Part II** practical notebook for the implementation of this question.

In this question you are going to experiment with large pretrained models using the Huggingface's `transformers` library.

You will explore prompting an open-access large language model (EleutherAI-Pythia-1.4B), instruction-tuning using Low-Rank Adaptation (LoRA) and observe the difference in performance and generated outputs.