Neural networks
Natural language processing - merging representations
**Topics:** recursive neural network (RNN)

- Idea: recursively merge pairs of word/phrase representations

- We need 2 things
  - a model that merges pairs of representations
  - a model that determines the tree structure

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**Figure 1.** Illustration of our recursive neural network architecture which parses images and natural language sentences. Segment features and word indices (orange) are first mapped into semantic feature space (blue) and then recursively merged by the same neural network until they represent the entire image or sentence. Both mappings and mergings are learned.
Topics: recursive neural network (RNN)

- Given two input representations $c_1$ and $c_2$, the recursive network computes the merged representation $p$ as follows:

$$s = W^{\text{score}}p$$
$$p = f(W[c_1; c_2] + b)$$

- The network also computes a score $s$
  - it estimates the quality of the merge
  - it will be used to decide which pairs of representations to merge first