

# DEEP LEARNING WITH KERAS

## TEXT GENERATION

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# Text Generation Problem

- Question Answering
- bAbi tasks
  - Dataset from Facebook: <https://research.fb.com/downloads/babi/>
  - Supporting Facts

## STORY

- 1 John moved to the bedroom.
- 2 **Mary grabbed the football there.**
- 3 Sandra journeyed to the bedroom.
- 4 Sandra went back to the hallway.
- 5 Mary moved to the garden.
- 6 **Mary journeyed to the office.**
- 7 Where is the **football**? office 2 6

## QUESTION

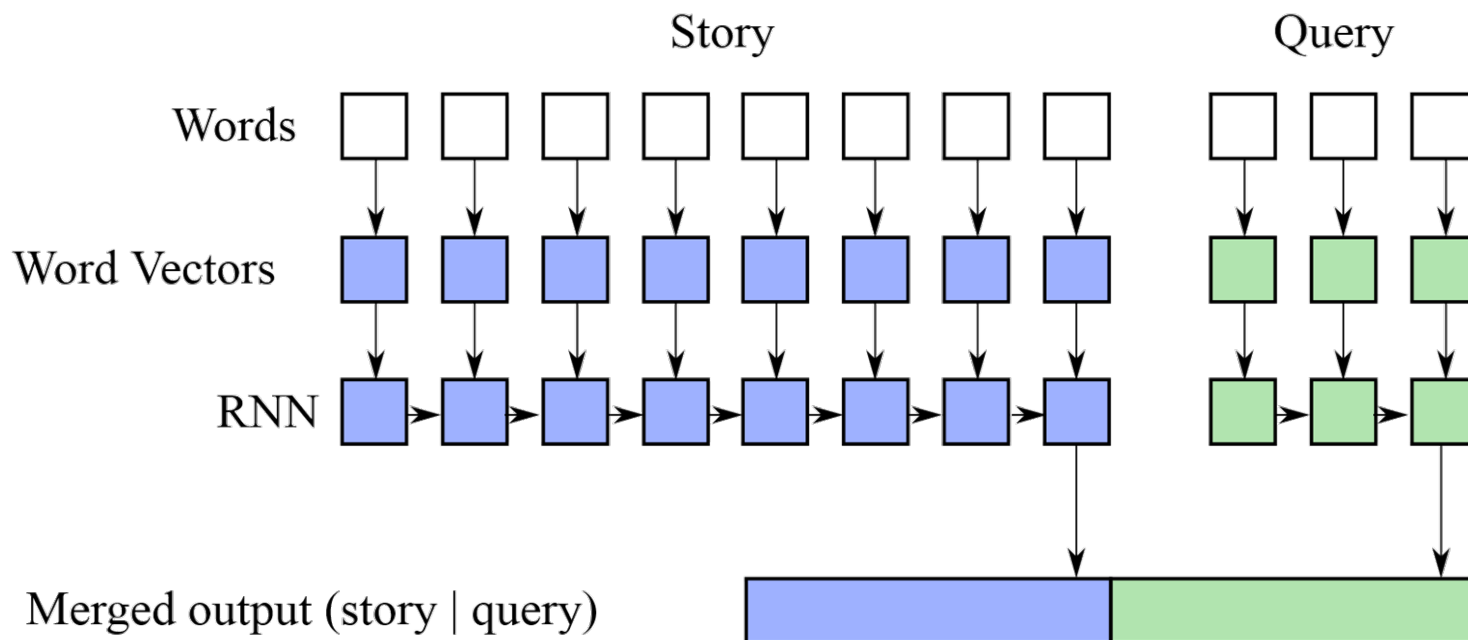
Where is the **football**?

## ANSWER

office 2 6

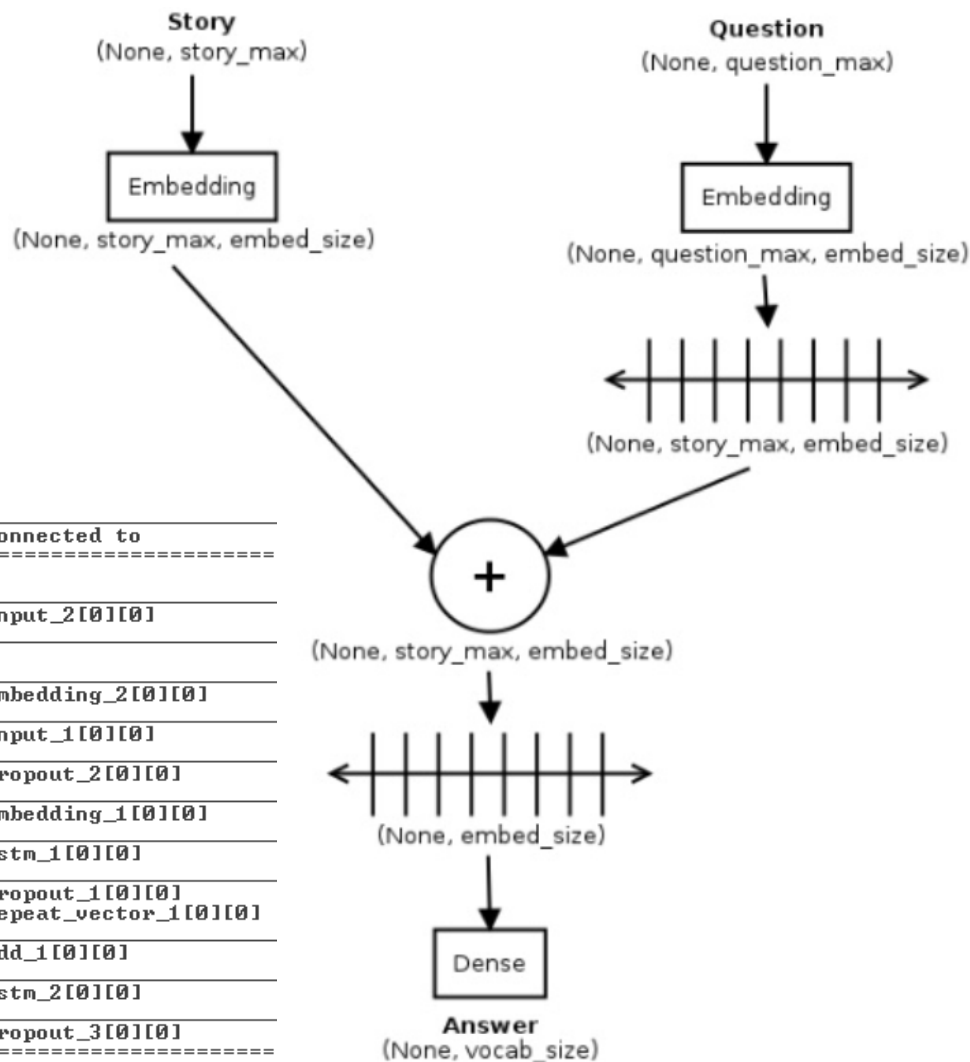
# Feature Representation

- Each word has an ID, so each story/query is a vector
- Train two models, one for stories and one for queries



# Solution using LSTM

- 2 Embedding layers
  - 1 for stories
  - 1 for questions
- Merge into LSTM layer
- Dense layer on output



Layer (type)	Output Shape	Param #	Connected to
input_2 (InputLayer)	$\langle None, 4 \rangle$	0	
embedding_2 (Embedding)	$\langle None, 4, 50 \rangle$	1100	input_2[0][0]
input_1 (InputLayer)	$\langle None, 66 \rangle$	0	
dropout_2 (Dropout)	$\langle None, 4, 50 \rangle$	0	embedding_2[0][0]
embedding_1 (Embedding)	$\langle None, 66, 50 \rangle$	1100	input_1[0][0]
lstm_1 (LSTM)	$\langle None, 50 \rangle$	20200	dropout_2[0][0]
dropout_1 (Dropout)	$\langle None, 66, 50 \rangle$	0	embedding_1[0][0]
repeat_vector_1 (RepeatVector)	$\langle None, 66, 50 \rangle$	0	lstm_1[0][0]
add_1 (Add)	$\langle None, 66, 50 \rangle$	0	dropout_1[0][0] repeat_vector_1[0][0]
lstm_2 (LSTM)	$\langle None, 50 \rangle$	20200	add_1[0][0]
dropout_3 (Dropout)	$\langle None, 50 \rangle$	0	lstm_2[0][0]
dense_1 (Dense)	$\langle None, 22 \rangle$	1122	dropout_3[0][0]