Question answering neural network

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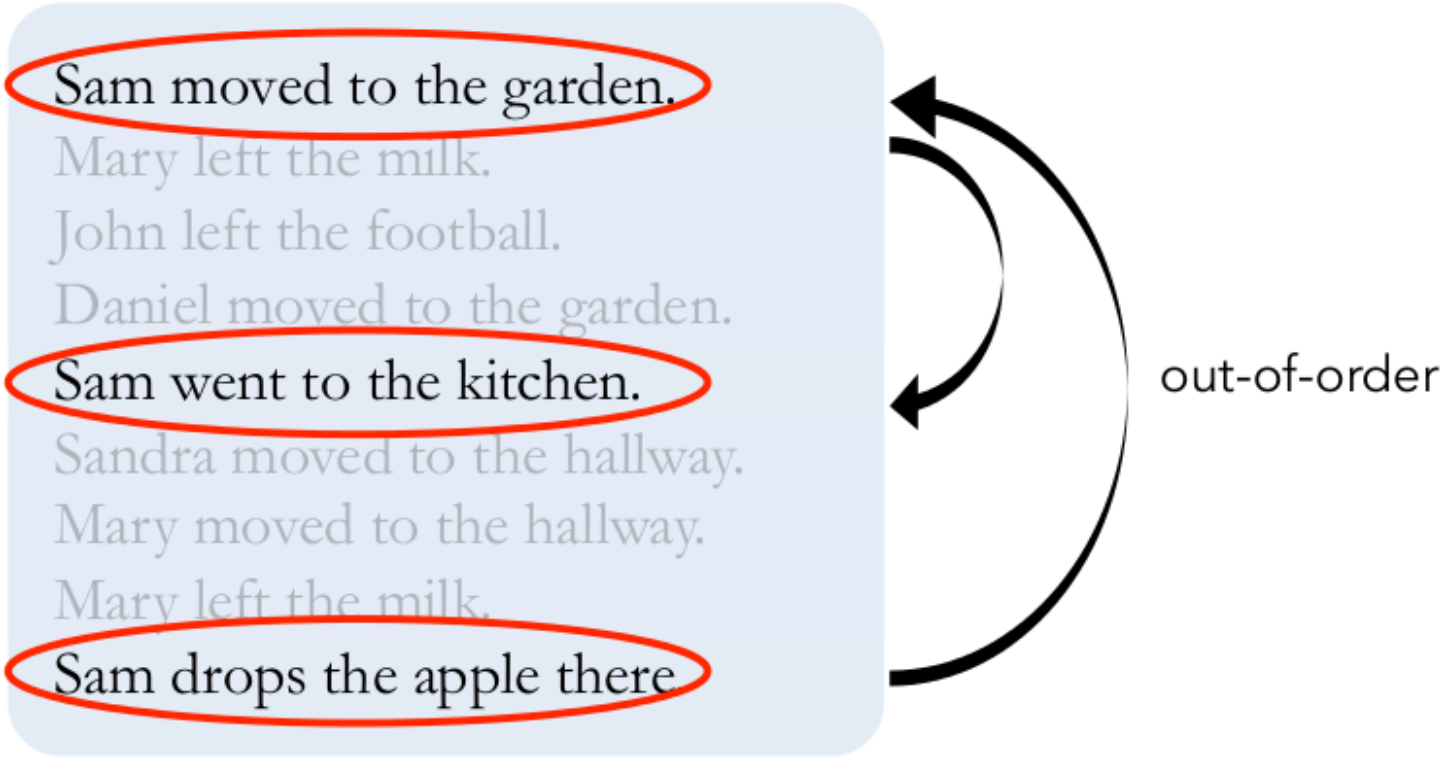
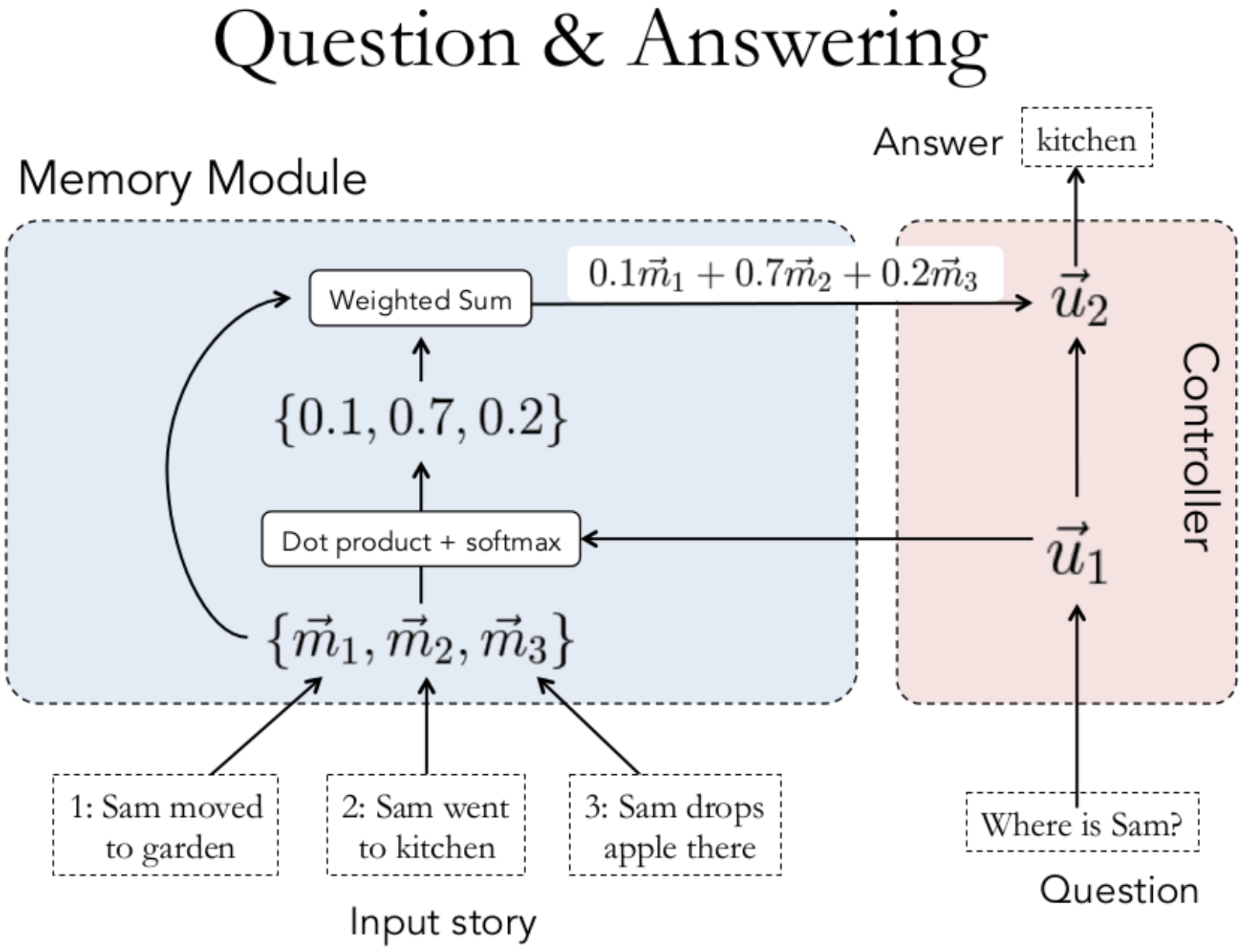
Ex) Question & Answering on story



Q: Where was the apple after the garden?

Figure 1: Out of order Example.

Question answering architecture



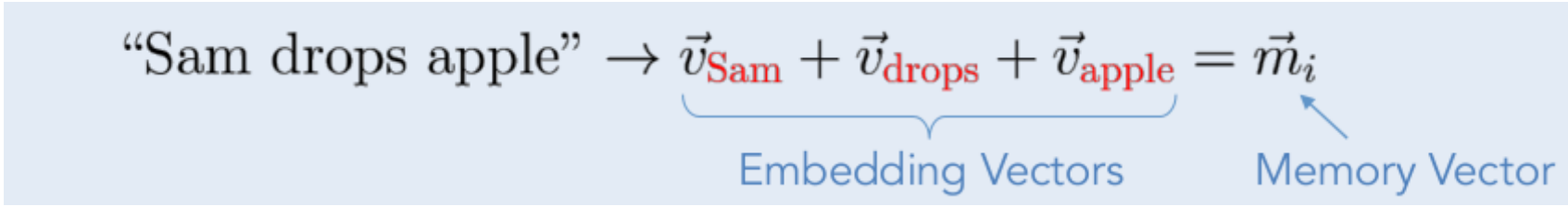


Figure 3: One example memory vector.

E.g.) **temporal structure:** special words for time and include them in BoW

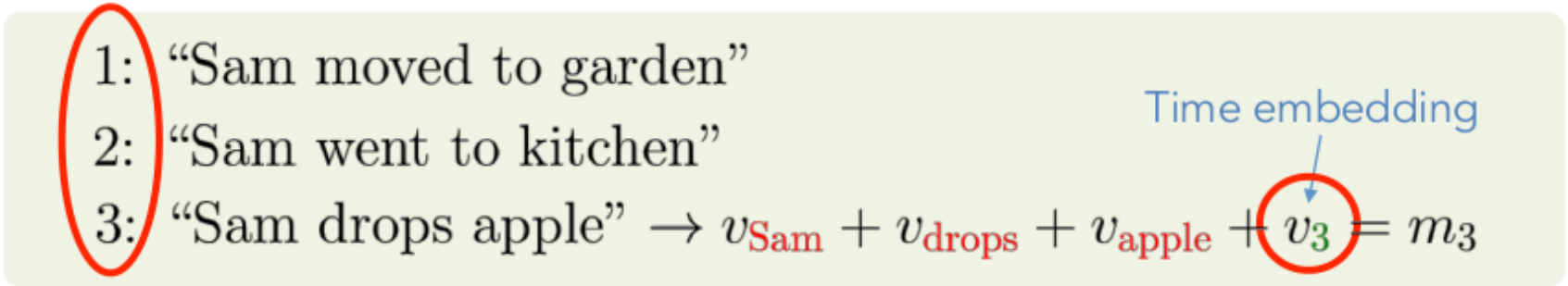


Figure 4: capturing temporal aspect.

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[1]Memory Networks Sainbayar Sukhbaatar 1 , Arthur Szlam 2 , Jason Weston 2 and Rob Fergus

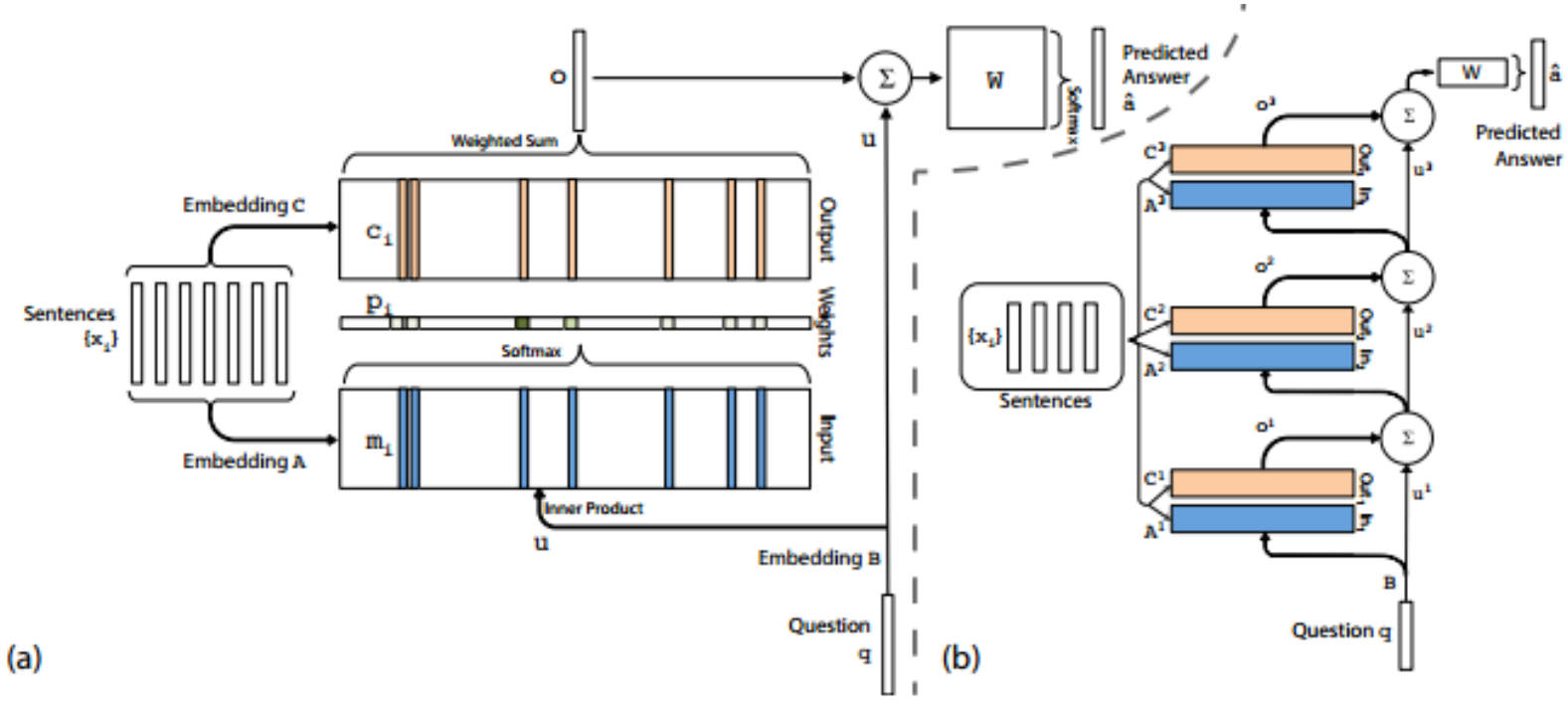

Figure 5: High level view of model.

Results

Neural attention model performs better than all other models.

Model	**Accuracy**
MLP	25
LSTM	35
Neural Attention model	99

Conclusion

- LSTM has two main problem, 1. It can not store the memory given long time ago. 2. it does not take question representation into account when it encodes context sentence.
- Attention mechanism can address both the problems.
- Neural attention model performs best for BABI question answering task.

References

[1] J. Weston, S. Chopra, and A. Bordes, "Memory networks," *arXiv preprint arXiv:1410.3916*, 2014.

[2] J. L. Elman, "Distributed representations, simple recurrent networks, and grammatical structure," *Machine learning*, vol. 7, no. 2-3, pp. 195–225, 1991.

[3] S. Hochreiter and J. Schmidhuber, "Long short-term memory," *Neural computation*, vol. 9, no. 8, pp. 1735–1780, 1997.

[4] S. Sukhbaatar, J. Weston, R. Fergus, *et al.*, "End-to-end memory networks," in *Advances in neural information processing systems*, pp. 2440–2448, 2015.