

A Question-Answering System that Can Count

Abbas Saliimi Lokman, Mohamed Ariff Ameen, and Ngahzaifa Ab. Ghani

Faculty of Computing, College of Computing and Applied Sciences, Universiti Malaysia Pahang,
Lebuhraya Tun Razak, Gambang, Kuantan, Pahang 26300, Malaysia e-mail: abbas@ump.edu.my

ABSTRACT

This paper proposes a conceptual architectural design of Question- Answering (QA) system that can solve “counting” problem. Counting problem is the inability of QA system to produce numerical answer based on retrieved rationale (in text passage) containing list of items. For example, consider “How many items are on sale?” as question and “Currently shampoo, soap and conditioner are on sale” as retrieved rationale from text passage. Normally, system will produce “shampoo, soap and conditioner” as an answer while the ground truth answer is “three”. In other words, system is simply unable to perform the counting process needed in order to correctly answer such questions. To solve this problem, QA system architecture with following components is proposed: (1) A classifier to determine if given question requires a counting answer, (2) A classifier to determine if current system’s answer is not numeric, and (3) A counting method to produce numerical answer based on given rationale. Despite looking like a whole system, the proposed architecture is actually a modular system whereby each component can operate independently (allowing each component to be separately implemented by other systems). In essence, this paper intends to demonstrate a general idea of how the defined problem can be solved using a modular system, that hopefully also opens up more flexible enhancements in the future.

DOI: https://doi.org/10.1007/978-981-33-4069-5_6

KEYWORDS: QA system, Natural language processing, Machine learning

ACKNOWLEDGEMENTS

This work was supported in part by Department of Higher Education, Ministry of Education Malaysia under the Fundamental Research Grant Scheme (FRGS), through Universiti Malaysia Pahang (Ref: FRGS/1/2018/ICT02/UMP/02/12).

REFERENCES

- [1] Banerjee P, Pal KK, Mitra A, Baral C (2019) Careful selection of knowledge to solve open book question answering. arXiv preprint arXiv:1907.10738
- [2] Brown TB, Mann B, Ryder N, Subbiah M, Kaplan J, Dhariwal P, Neelakantan A, Shyam P, Sastry G, Askell A, Agarwal S (2020) Language models are few-shot learners. arXiv preprint arXiv:2005.14165
- [3] Choi E, He H, Iyyer M, Yatskar M, Yih WT, Choi Y, Liang P, Zettlemoyer L (2018) Quac: question answering in context. arXiv preprint arXiv:1808.07036.
- [4] Devlin J, Chang MW, Lee K, Toutanova K (2018) Bert: pre-training of deep bidirectional transformers for language understanding. arXiv preprint arXiv:1810.04805
- [5] ...