

Author Contributions

Yanda Chen co-led the project direction, conducted most of the core experiments, and contributed most of the writing for our paper. **Joe Benton** provided substantial feedback and guidance throughout the project, conducted the evaluation of open-source models, and contributed to editing our paper. **Ansh Radhakrishnan** built and developed the RL infrastructure that made this work possible, and supported the RL experiments of this paper. **Jonathan Uesato** built and developed the RL infrastructure that made this work possible, and supported the RL experiments of this paper. **Carson Denison** built and developed the RL infrastructure that made this work possible, and supported the RL experiments of this paper. **John Schulman** initiated, built and developed the RL infrastructure that made this work possible. **Arushi Somani** conducted RL ablation experiments on CoT scoring with preference models. **Peter Hase** provided valuable discussions on the project during its early stages. **Misha Wagner** provided valuable feedback throughout the project. **Fabien Roger** provided valuable feedback throughout the project, and contributed to the paper writing. **Vlad Mikulik** provided regular and valuable guidance and feedback throughout the project. **Sam Bowman** provided substantial guidance and feedback on overall directions, experiments to run, key results, and paper writing. **Jan Leike** provided substantial guidance and feedback on overall directions, experiments to run, key results, and paper writing. **Jared Kaplan** provided substantial guidance and advising on overall directions, key results, and presentation. **Ethan Perez** co-led and oversaw the project direction, and provided detailed and valuable guidance on directions, experiments, results, and paper writing.

Acknowledgements

We are grateful to many people for helpful conversations and feedback, including Tim Belonax, Steven Bills, Johannes Gasteiger, Erik Jones, Akbir Khan, Samuel Marks, Cam McKinnon, Linda Petrini, Sara Price, Stuart Ritchie, Buck Shlegeris, Zihan Wang, Jerry Wei, Ruiqi Zhong, and Daniel Ziegler. We would also like to thank everyone else at Anthropic for supporting this work, developing the models, infrastructure, and other contributions that made our experiments possible.

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