Read [this article](https://www.sciencemag.org/news/2018/07/computer-programs-can-learn-what-other-programs-are-thinking).

Find a source. Write 0.5-1-page report, where you answer following questions:

#find the actual source of this article.
http://proceedings.mlr.press/v80/rabinowitz18a/rabinowitz18a.pdf

1. What *actually* was done? what was the important thing that happened.

Different species of agents were created each agent, there were two species one that were random and the other had a unique, fixed reward function over the four objects, and planned its behaviour through value iteration. Three experiments are detailed in the research paper. The first they provided ToMnet with a full trajectory of an agent on a single past MDP they then queried ToMnet with the initial state of a current MDP and asked for a set of predictions. The second experiment they trained a ToMnet to observe only partial trajectories of the agent's past behaviour. They conditioned the ToMnet on single observationaction pairs from a small number of past MDPs. Finally, they enriched the agent species by applying a veryhigh move cost (0.5) to 20% of the agents; these agents therefore generally sought the closest object. They trained a ToMnet to observe Npast $\sim$ U{0, 5} full trajectories of randomly-selected agents before making its behavioural prediction. The ToMnet learned to infer from even a single trajectory which subspecies of agent it was observing, and predict future behaviour accordingly. The most important thing that happened for me was the fact that ToMnet could understand whe na character had false beliefs In this test a character was near sighted and when the computer altered the landscape half way through the game the ToMnet was still able to accurately predict the agents moves and that it would stick to it´s original path more frequently than better sighted agents.

2. What was the *experiment (with numbers and results)*?

I answered what was the experiment above in detail, I was unable to find specific numbers, only some mathematical equations in the research paper which I did not understand.

3. What *ideas from ToM* were used? ToM = Theory of Mind.

TOMnet which uses meta-learning to build such models of the agents it encounters. The ToMnet learns a strong prior model for agents future behaviour, and, using only a small number of behavioural observations, can bootstrap to richer predictions about agents' characteristics and mental states. The ideas used are the the analysis of beliefs, desires and intentions. All three are implemented within the three modules in the ToMnet

4. What is the *solution architecture*?

Its the ToMnet architecture, which is comprised on three modules, the character net, the mental state net and the prediction net. Character net characterises the agent by parsing the previously

perceived episode. The goal of the mental net is to mentalise about the presented agent during the current episode. Lastly the prediction net leverages the character net and the mental net to predict the subsequent moves of the agent.