# Project Summary

*Many people know Pokémon for its messages of friendship and its adorable yellow mascot. However, Pokémon also are monstrous beings who we pit against each other for entertainment.*

*This project- named “GOTTA CATCH ‘EM ALL” aims to create the best team of Pokémon given a pool to choose from to fight another team. A model will correspond to the roles, typing, and moves of each Pokémon that counters an opposing Pokémon on the other team. If no model exists it means no team exists from the given pool that completely counters the opponent.*

# Propositions

We have come up with following propositions:

* *pₙm:* Which validates as true when Pokémon n on our team is an apt counter for Pokémon m on the opponent’s team. Is dependent on the following propositions to be true.
* *tₙm:* Which validates as true when Pokémon n’s type is effective against Pokémon m on the opponent’s team*.*
* *rₙm:* Which validates as true when Pokémon n’s role is effective against Pokémon m on the opponent’s team*.*
* *anxm:* Validates true when a Pokémon n’s *xth* attack’s type or effect is effective against Pokémon m.
* *hp:* A proposition that determines if an attack will hit the player.
* *sm:* Proposition that determins if Pokemon m on the opponent’s team switch out, or stays in.

# Constraints

* *The model only evaluates true if:*
  + *p₁* ∧ *p₂* ∧ *p₃* ∧ *p₄* ∧ *p₅* ∧ *p₆*

*(The model proposed will only evaluate as true if a disjunction between p₁, p₂, p₃, p₄, p₅, p₆ exists)*

* *A Pokémon is only considered a valid counter if:*
  + *pₙ =( tₙ ∨ sₙ)* ∧ *anxm*
  + Note: For *anxm*to evaluate true, at least 2 of 4 of the Pokemon’s attacks must be effective.

# Model Exploration

*List all the ways that you have explored your model – not only the final version, but intermediate versions as well. See (C3) in the project description for ideas.*

Draft Exploration:

* As of right now, the project discriminates against Pokémon who rely on abilities and high stats. While implementing abilities is probably not possible, it may be possible to implement a stat system or simplified stat system.
* Constraints are dynamically added now depending if the Pokémon’s attributes are effective.
* We are using variable likelihood to determine percentage possibilities of beating each Pokemon, they seem to consistently skew around the 60s to 70s as of now, but I have not implemented a large pool so it may be that.

# First-Order Extension

*Describe how you might extend your model to a predicate logic setting, including how both the propositions and constraints would be updated.* ***There is no need to implement this extension!***

# Feedback Notes

The model can either be developed further for two functions. One option is the model will choose a team from a pool of possible Pokémon to beat the opponent of opponent(s). The other option is given a pool of Pokémon, make the most optimal team. Not sure which way to go. Another issue is we are kind of confused on what to do for the Jape and First-Order Extension.