Example: Logistic Regression

$$\sum_i \log 1 + y_i(x_i \cdot r) - \log(1 + e^{x_i \cdot r})$$

Dropping the $\log 1$ and maximizing wrt r gives us logistic regression

How to maximize?

How to predict?

- Given r, x_i make a prediction for unknown y_i, choose y_i to max LLH
- That is, choose y_i to match sign of $x_i \cdot r$ ($y_i = 1$ if $x_i \cdot r > 0$, $y_i = 0$ otherwise)