Horse-race betting

- You go to the horse races with one dollar $b_0 = 1$
- m horses compete in each race.
- Before each race, the odds for each horse are announced: $o_t(1), \ldots o_t(m)$ (arbitrary positive numbers)
- You have to divide *all* your money among the different horses. $\sum_{j=1}^{t} \hat{p}_t(j) = 1$
- The horse $1 \leq y_t \leq m$ is winner of the tth race.
- After iteration t, you have $b_t = b_{t-1} \hat{p}_t(y_t) o_t(y_t)$ dollars
- After n races, you have $b_n = \prod_{t=1}^{n} \hat{p}_t(y_t) o_t(y_t)$ dollars.
- Taking logs, we get cumulative log loss.