NPTEL: Bandit Algorithm (Online Machine Learning)

June 2020

Assignment 9 (5 Marks)

1. (5 marks) Let $\mathcal{C}$ be a finite context set and let $c_1, \ldots, c_n \in \mathcal{C}$ be an arbitrary sequence of contexts.

1. Show that $\sum_{c \in \mathcal{C}} \sqrt{n \sum_{t=1}^{n} I\{c_t = c\}} \leq \sqrt{n|\mathcal{C}|}$.

2. Assume that $n$ is an integer multiple of $|\mathcal{C}|$. Show that the choice that maximizes the right-hand side of the previous inequality is the one when each context occurs $n/|\mathcal{C}|$ times.