COS 511: Theoretical Machine Learning

Hint on HW#8, problem 1a — Spring, 2019

Use the universal portfolios algorithm and its analysis.

Also, here is a fact from calculus that you might find helpful. If $c_1, \ldots, c_N$ are nonnegative integers (with $N \geq 2$), then

$$\int \left(\prod_{i=1}^{N} {b_i}^{c_i} \right) d\mu(\mathbf{b}) = \frac{\prod_{i=1}^{N} (c_i!)}{\left(N - 1 + \sum_{i=1}^{N} c_i \right)!}$$

where, as in class, the integral is over all vectors $\mathbf{b} = \langle b_1, \ldots, b_N \rangle \in [0,1]^N$ with $\sum_{i=1}^{N} b_i = 1$.