

## Bound better than for two part codes

- ▶ Simple bound as good as bound for two part codes (MDL) but enables online compression
- ▶ Suppose we have  $K$  copies of each expert.
- ▶ Two part code has to point to one of the  $KN$  experts  
 $L_A \leq \log NK + \min_i L_i^T = \log NK + \min_i L_i^T$
- ▶ If we use Bayes predictor + arithmetic coding we get:

$$L_A = -\log W^{T+1} \leq \log K \max_i \frac{1}{NK} e^{-L_i^T} = \log N + \min_i L_i^T$$

- ▶ We don't pay a penalty for copies.
- ▶ More generally, the regret is smaller if many of the experts perform well.