

- Consider a DMC $p(y|x)$.
- For every input distribution $p(x)$, prove that the rate $I(X; Y)$ is achievable by showing for large n the existence of a channel code such that
 1. the rate of the code is arbitrarily close to $I(X; Y)$;
 2. the maximal probability of error λ_{max} is arbitrarily small.
- Choose the input distribution $p(x)$ to be one that achieves the channel capacity, i.e., $I(X; Y) = C$.