

PROBLEM 2: EFFICIENT, UNAMBIGUOUS ENCODING
UNDERGRADUATE PROBLEM SOLVING CONTEST
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A covert military unit has been using a messaging system consisting of 5 tones: A, B, C, D, E . A miscommunication has revealed a problem. When A is transmitted it can be received as A or B , B can be received as B or C , C can be received as C or D , D can be received as D or E . E , however, is always received as E . A study of the 100 most common messages reveals that B is transmitted most frequently, followed by A , then D , then C . E is transmitted very rarely. Develop the most efficient (fewest number of tones transmitted) and unambiguous encoding for this 5-tone messaging system and explain why your system is optimal.