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1. MPEG-4 motion compensation is supposed to be VOP-based. At the end, the VOP is still divided into macroblocks (interior macroblock, boundary macroblock, etc.) for motion compensation.
    - (a) What are the potential problems of the current implementation? How can they be improved?
    - (b) Can there be true VOP-based motion compensation? How would it compare to the current implementation?
  4. Motion vectors can have subpixel precision. In particular, MPEG-4 allows quarter-pixel precision in the luminance VOPs. Describe an algorithm that will realize this precision.
  6. What is the computational cost of SA-DCT, compared to ordinary DCT? Assume the video object is a  $4 \times 4$  square in the middle of an  $8 \times 8$  block.