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Exercise Collection 2

The exercises will be discussed at Nov. 15 2016.

Analyse the system OutGuess (`http://uncovering-cicada.wikia.com/wiki/OutGuess`).

1. Consider the example images given at the moodle platform of this course.
2. The images *StegoWork with OutGuess 01* to *StegoWork with OutGuess 05* are 5 copies of the same image with an added payload (3 different key are used).
3. One of the two images *Test OutGuess 01* or *Test OutGuess 02* is the original image whereas the other image is a further copy with an embedded payload. Decide which copy is the original image.
4. Apply different compression rates of the jpg-encoding (e.g. by using Octave and
   `imwrite(image, filename.jpg, 'Quality', 100);`,
   `imwrite(image, filename.jpg, 'Quality', 85);`,
   ...) and analyse the differences between *Test OutGuess 01* and *Test OutGuess 02* according to the different compression rates.

Test yourselves:

1. Take the image *Image without digital watermark* from the moodle platform of this course.
2. Compute the DCT of a partition of the image into 8×8 blocks. To compute the DCT you can use any library for MatLab or Octave).
3. For each of the 4 quarters perform the following test:
   - Multiply the values of the quarters with some constants: 1, -1, 2, -2, ...
   - Compute the inverse DCT.
   - For which constant do you discover a significant observable change of the image.
4. For each of the 4 quarters perform the following second test:
   - Add some constant values to the values of the quarters: 50, -50, 100, -100, ...
   - Compute the inverse DCT.
   - For which constants do you discover a significant observable change of the image.