1. Write a method to perform real-valued indexing on an image. Your method should receive an image $I$ and arrays of (real-valued) pixel coordinates $r$ and $c$ and return the RGB values obtained by performing the area-based averaging algorithm discussed in class. Use this function and regular rounding to evaluate the results of each of the methods from the following questions.

2. The program to project a rectangular area to a target image presented in the class web page does not produce good results when perspective effects are significant. Modify the program as follows: split the rectangle into two triangles, compute separate homographies for each triangle, and use the these homographies to project the triangles separately. Evaluate your program with your own images.

3. (Extra credit for 4363, mandatory for 5363) Modify your homography-based program from the previous question to perform inverse warping, instead of forward warping.

4. Modify the single point warping program presented in the class web page to perform a sequence of single point warps, using the output of the previous warp as the input for the next warp.

5. Write a program to perform multi-point warping using k-nearest neighbors. In contrast to the previous item, your program should receive all source-destination pairs prior to warping the image. Your program should allow the user to input as many source and destination points as desired and then generate a sequence of images illustrating a smooth transition from the source to the destination image.

6. (Extra credit for 4363, mandatory for 5363) Write a program to morph a face image in frontal view into another. Use a variation of your program from the previous question to align the faces, then apply cross-dissolve.

Write a report including (at least) the following items:
1. Problem description.
3. Experimental results. Describe quality of results and running times.
4. Discussion of results. Do the algorithms work as expected? Why or why not?
5. Conclusions. Describe what you learned, what was challenging, what was interesting, what was boring, etc.
6. Appendix: Source code