Homework 4 solution template

CMPSCI 370 Spring 2019, UMass Amherst

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Here is a template that your solutions should roughly follow. Include outputs as figures, and code should be included in the end.

1 Scale Invariant Feature Transform

- What are the advantages of blob detection over the Harris corner detection?

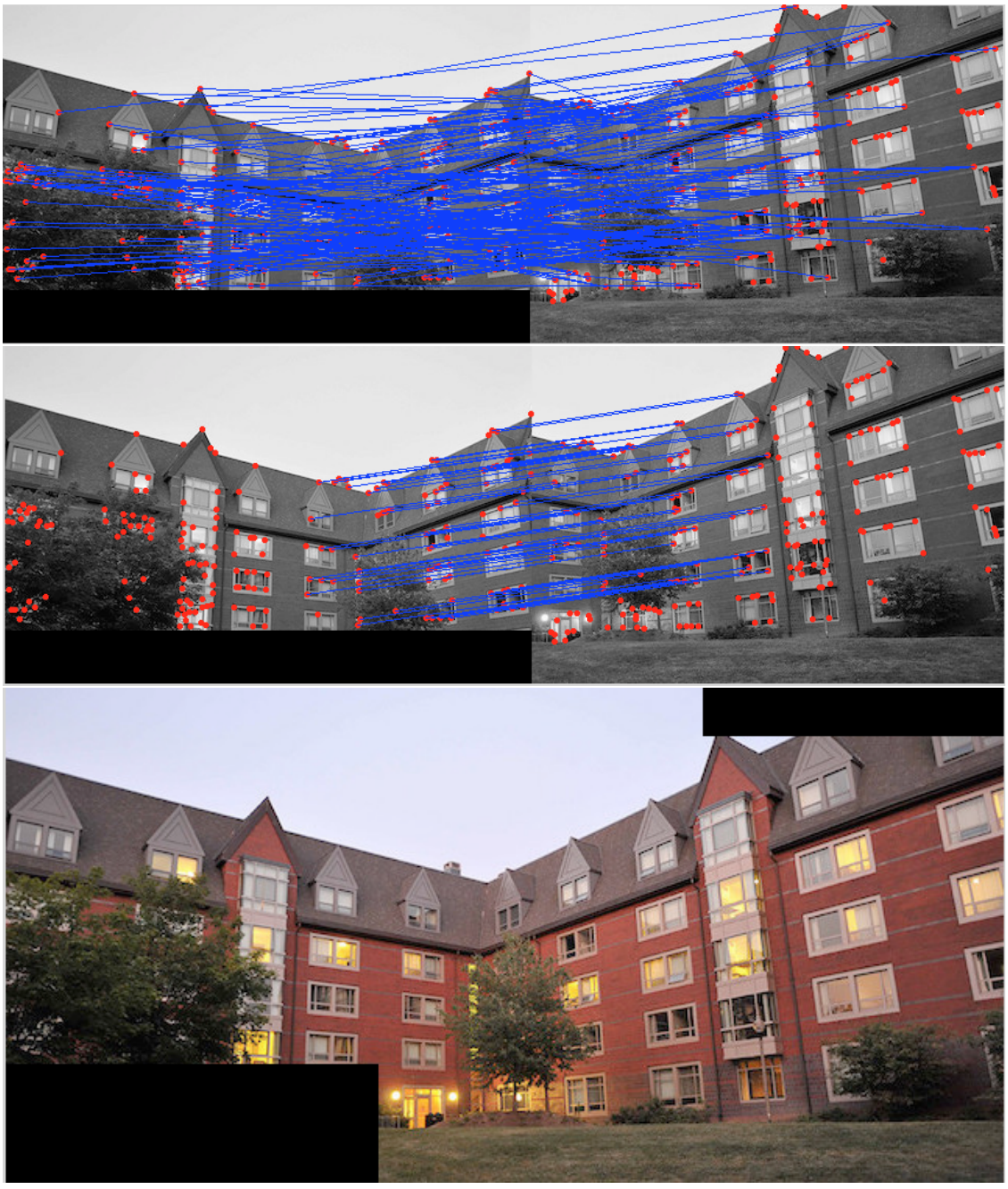
- How is rotation invariance achieved in SIFT features?

- When can matching patches using sum-of-squared-differences between the vector of pixel values fail? List two scenarios when the pixel values can change significantly.

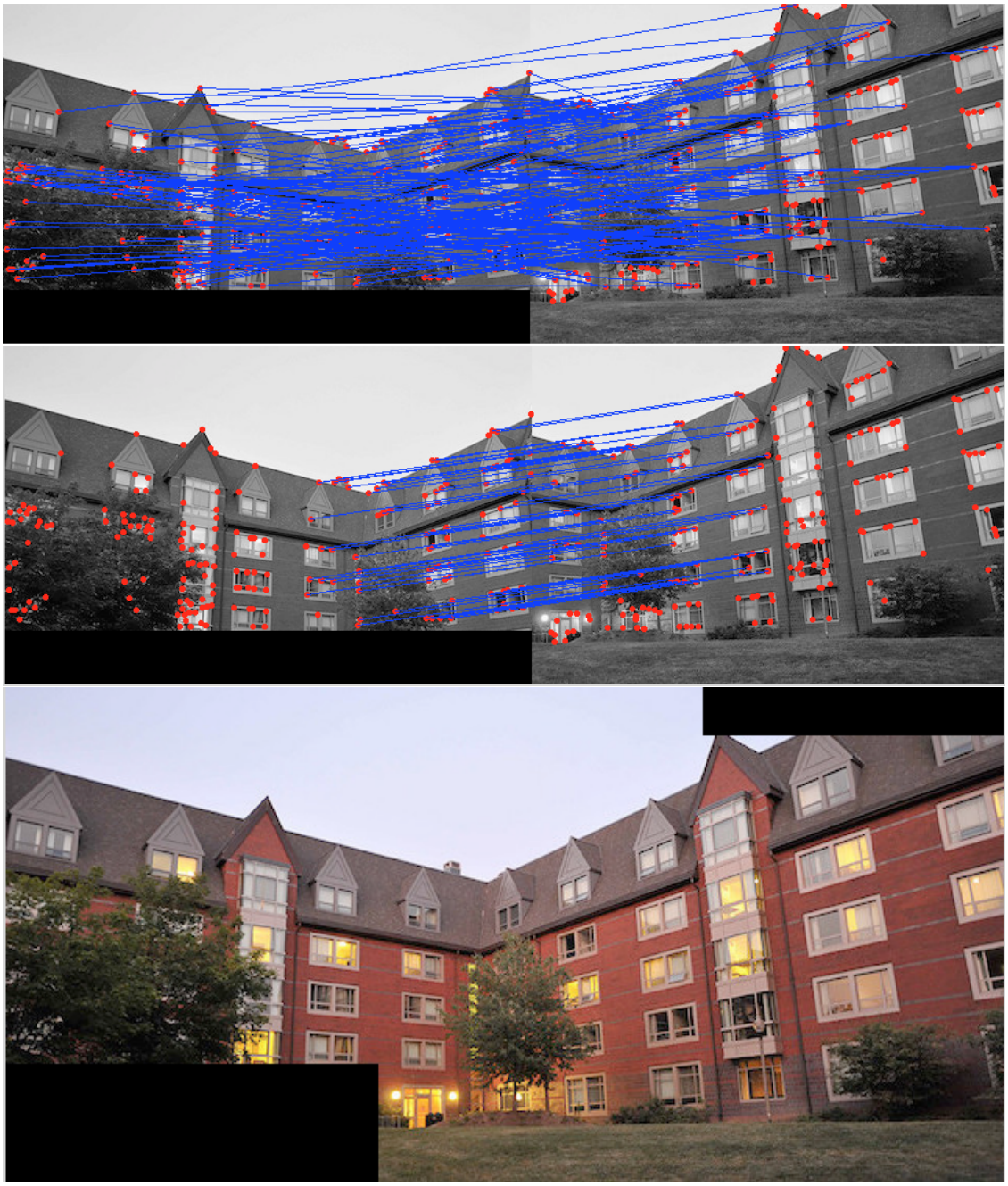
- List two ways how the SIFT descriptor provides robustness during feature matching?

2 Image Stitching

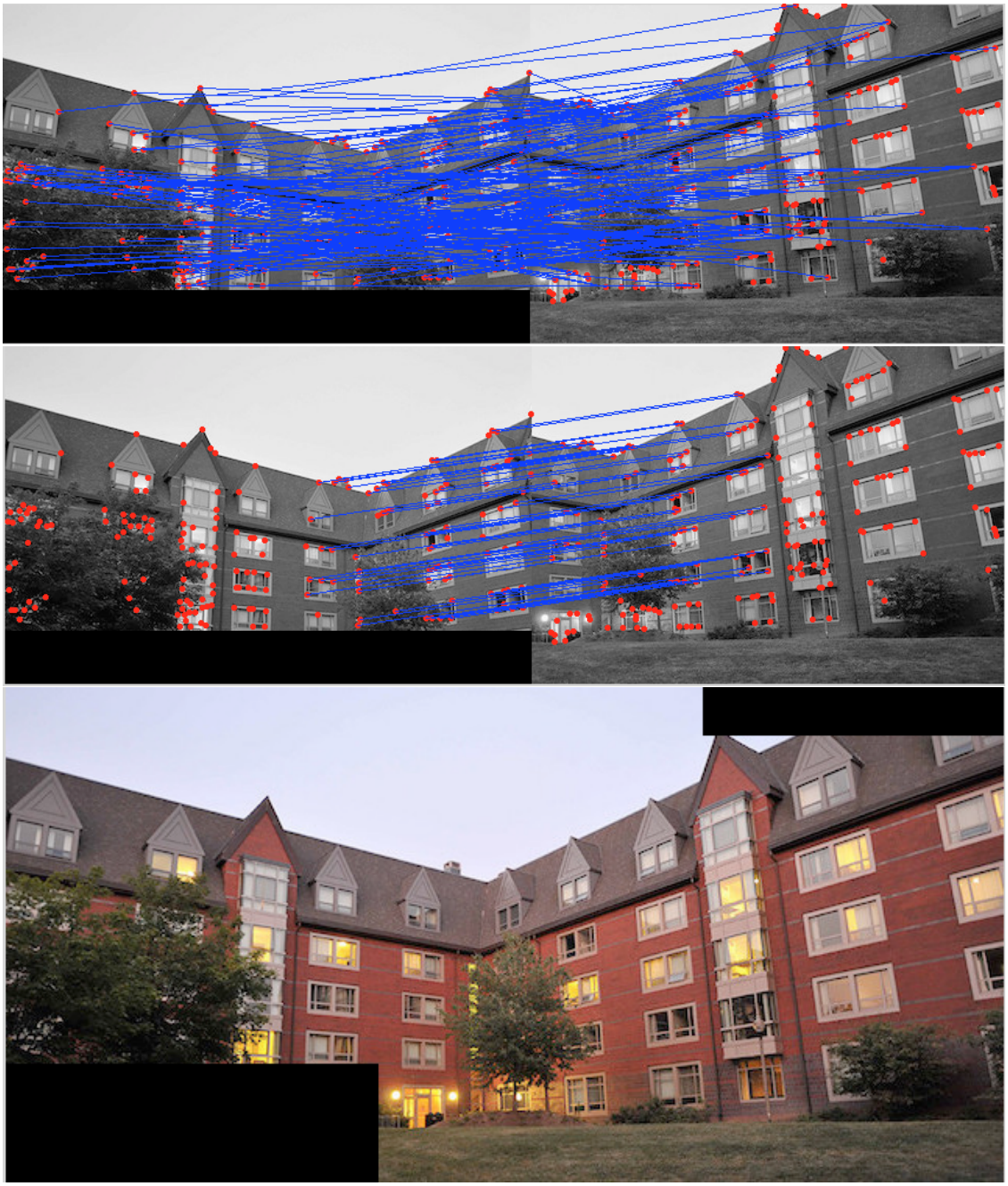
- Outputs for umass_building_right1.jpg



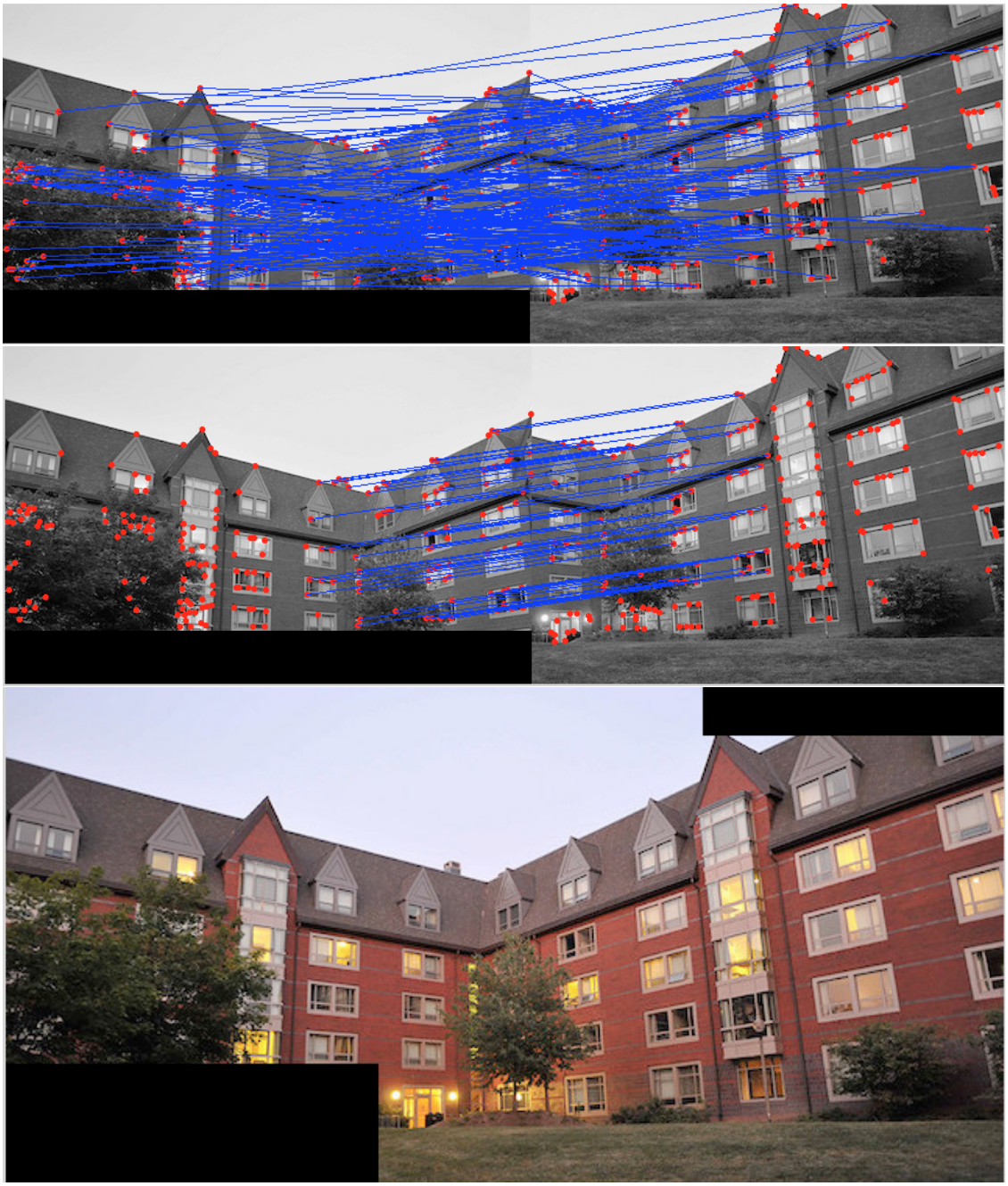
- Outputs for umass_building_right2.jpg



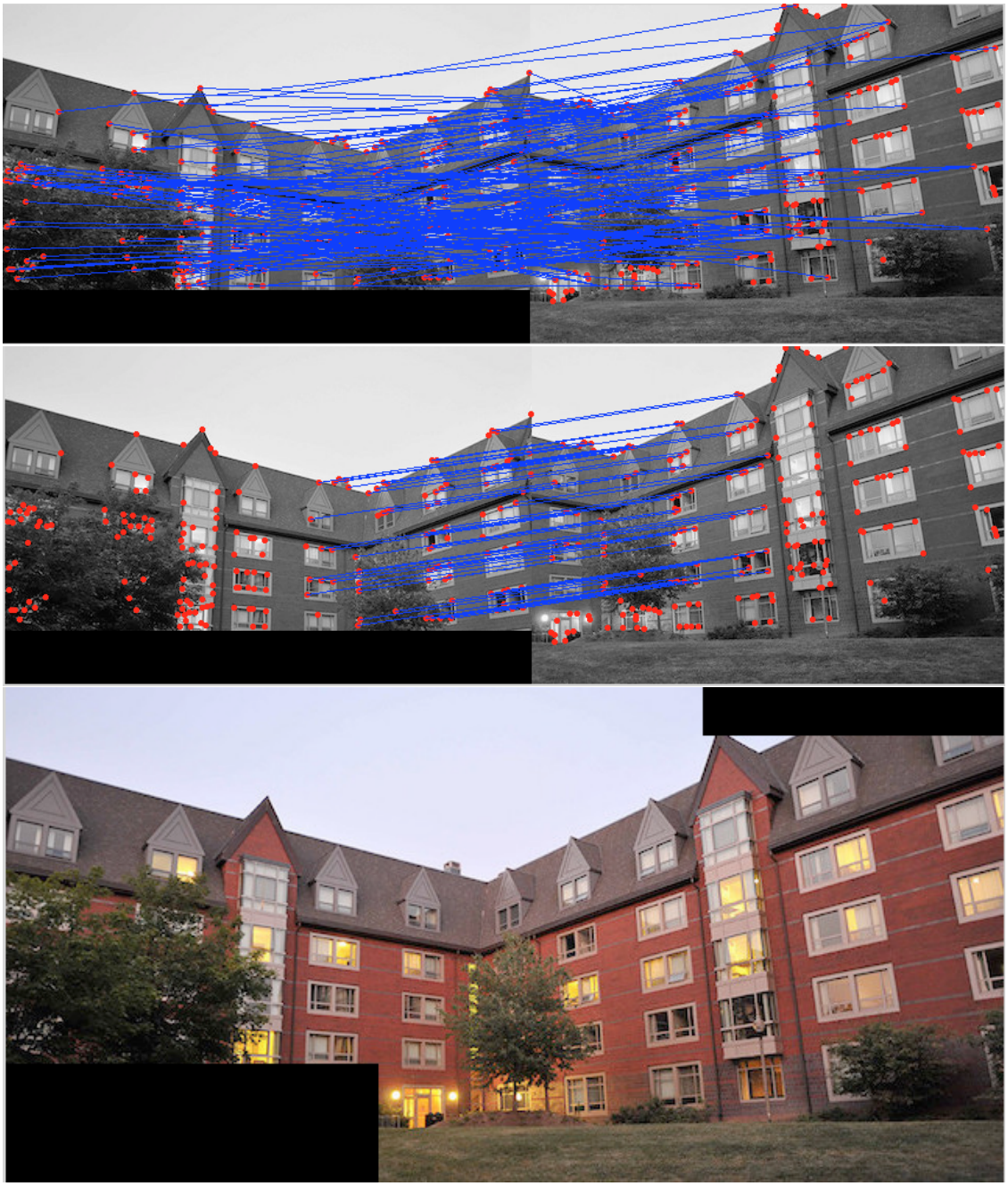
- Outputs for umass_building_right3.jpg



- Outputs for umass_building_right4.jpg



- Outputs for umass_building_right5.jpg



- Estimated transformations and number of inliers

im2	tx	ty	s	#inliers
umass_building_right1.jpg				
umass_building_right2.jpg				
umass_building_right3.jpg				
umass_building_right4.jpg				
umass_building_right5.jpg				

Table 1: Estimated transformation.

3 Solution code

Include the source code for your solutions as seen below (only the files you implemented are necessary). In latex the command `verbatiminput{alignChannels.m}` allows you to include the code verbatim as seen below. Regardless of how you do this the main requirement is that the included code is readable (use proper formatting, variable names, etc.) A screenshot of your code works to provided you include a link to source files.

3.a extractFeatures.m

```
function f = extractFeatures(im, c, patchRadius)
% This code is part of:
%
%   CMPSCI 370: Computer Vision, Spring 2018
%   University of Massachusetts, Amherst
%   Instructor: Subhransu Maji
%
%   Homework 4
```

3.b computeMatches.m

```
function m = computeMatches(f1,f2)
% This code is part of:
%
%   CMPSCI 370: Computer Vision, Spring 2018
%   University of Massachusetts, Amherst
%   Instructor: Subhransu Maji
%
%   Homework 4
```

3.c ransac.m

```
function [inliers, transf] = ransac(matches, c1, c2)
% This code is part of:
%
%   CMPSCI 370: Computer Vision, Spring 2018
%   University of Massachusetts, Amherst
%   Instructor: Subhransu Maji
%
%   Homework 4
```