Image Preprocessing Worksheet

Name:

Date:

Institution:

1. **(2 pts)** What is motion correction? What is the difference between “global” and “patch” motion correction? Why is patch motion correction useful (provide specific examples)?
2. **(2 pts)** What are the pros and cons of removing the first few frames of your movies before running motion correction? On what basis would you make the decision to do so?
3. **(2 pts)** What is the effect of cropping your image in real space on the CTF? What is the effect of binning (increasing the pixel size) your image in real space on the CTF? It may be helpful to experiment with a CTF simulator like the one found at <https://3dem.github.io/relion/ctf.html>
4. **(3 pts)** Draw the CTF for micrographs under, over, and at focus for a standard TEM used in single particle analysis. What are the complications introduced when imaging at focus? What are the advantages?