Homework #7

1. (a) Choose one of “bread.bmp”, “salad.bmp”, or “potato.bmp” and add a little noise and print out the image. Then apply heat flow with fitting term until steady state for a small penalty $C$:

$$f_t = C\Delta f - 2(f - f_0)$$

to denoise the image. Use time step $k = h^2/(4C + h^2)$ and $h = 0.05$. Print out the result.

(b) Repeat the previous part adding more noise.

2. (a) Choose one of “bread.bmp”, “salad.bmp”, or “potato.bmp” and add a little noise and print out the image. Then apply TV minimizing flow with fitting term until steady state for a chosen penalty $C$:

$$f_t = \frac{C}{\sqrt{\|
abla f\|^2 + h^2}} \left( \Delta f - \frac{\nabla f^T \nabla^2 f \nabla f}{\|
abla f\|^2 + h^2} \right) - 2(f - f_0)$$

to denoise the image. Use time step $k = h^3/(4C + h^3)$ and $h = 0.05$. Print out the result.

(b) Repeat the previous part adding more noise.