problem1

the values of log-prior density indicate the Compatibility of the neighboring pixels of one image.

constant disparity map shows the highest Compatibility,its Log-prior = 0, cause every pixel has the same disparity.

due to the random noisy pixel, which is not correlated to its neighbor,

the noisy disparity map shows the lowest Compatibility its Log-prior = -2559991.

GT disparity map shows moderate Compatibility, because the pixels belonging to one Object are correlated to the neighbors.

increasing the sigma will also increases the log-prior density,GT-map from -50685 to -15332.

the Gaussian curve becomes smoother, pixels with different disparity will be considered as more similar.

reducing the range of noise increase the log-prior density. noisy-map from -2559991 to -729330.

because the effect of noise is milder, the pixels are more similar namely more correlated to each other.

probelm2

i) initialize the d0 using gt, the Algorithm ends up near gt, indicating that gt is already the optimal answer.

ii) initialize the d0 using constant value, the Algorithm stops near d0, showing no optimization effect,

cause the constant disparity indicates the highest compatibility, meaning every pixel is correlated to its neighbor.

based on the Observation, we can make the conclusion, that constant value is not a good Initialization.

iii) initialize the d0 using random value, the Algorithm converge towards GT, showing an optimization effect,

we can see the random value is a better initialization Option.

with the increase of alpha, in our result we can see the boundary of object becomes sharper.