

## q3

October 28, 2019

**0.1 Question 3 (6 marks):** Compute a Lipschitz constant for the smoothed Total-Variation problem. Note the Lipschitz constant is not unique. However, the minimum Lipschitz constant will give you better performance in algorithms compared to larger Lipschitz constants. This means that whatever you compute here will affect the running time of your algorithm in Q4.

```
[13]: def compute_lipschitz_tv(lamb, mu):  
      A = (lamb / mu) * D_s + I_s  
      g = matrix_p2_norm(A, tol=0.001)  
      return g.sum()
```

```
[14]: lambda_ = 45  
      mu = 0.1  
      L = compute_lipschitz_tv(lamb=lambda_, mu=mu)
```

```
[15]: L
```

```
[15]: 3600.7037619765943
```