

LASSO Problem

In the LASSO problem, we want to solve the least squares problem with l_1 norm constraint. In this work we use the following settings:

$$x^* = \arg \min_x \frac{1}{2} \|Ax - b\|^2 + \lambda \|x\|_1. \quad (1)$$

In this problem, A and b is set as:

```
1 np.random.seed(2021) # set a constant seed to get same
  random matrixs
2 A = np.random.rand(500, 100)
3 x_ = np.zeros([100, 1])
4 x_[ :5, 0] += np.array([i+1 for i in range(5)]) # x_
  denotes expected x
5 b = np.matmul(A, x_) + np.random.randn(500, 1) * 0.1 #
  add a noise to b
6 lam = 10 # try some different values in {0.1, 1, 10}
```