An optimization problem seeks to minimize or maximize the value of an objective function subject to a set of equality and inequality constraints. Many applications in science and engineering often require solving optimization problems, with matrices possibly appearing in the objective function, the constraints set or both. Although most of these problems can be solved exactly using polynomial time algorithms, these algorithms are too slow to deal with the large size of modern datasets and the matrices obtained by the latter. In practice, fast approximate algorithms, that are designed by carefully trading the accuracy of a solution with the runtime complexity, are preferred to slow exact algorithms. This talk will introduce linear sketching and highlight how it can be used to obtain fast approximate algorithms for least squares regression, least absolute deviations regression and low rank approximation.