Optimization – 1 – Line Search

Lucas N. Ribeiro

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Introduction

I have been reading Nocedal and Wright's "Numerical Optimization". I would like to maintain a series of notebooks where I implement the numerical algorithms discussed in the book. This is a way to practice my R skills and to materialize the concepts I'm learning.

The book's first chapter is simply an introduction to optimization problems and the second chapter is an overview of of optimization algorithms:

- Constrained vs. unconstrained
- Line search vs. trust region
- Smooth vs. non-smooth problems
- Scaling and rates of convergence

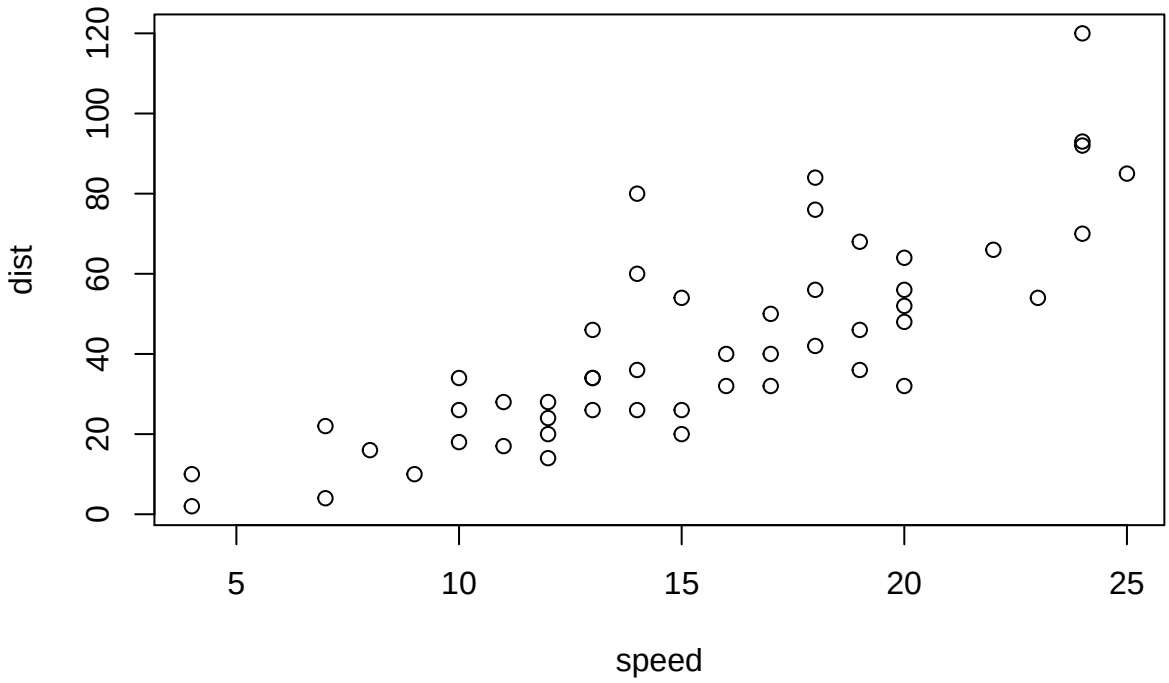
The third chapter discusses *Line search methods* and this is the subject of the present notebook.

Line search methods

Basically, a line search method finds a direction $\boldsymbol{p}_k$ and decides how far to move along this direction. These methods iterate according to

$$\boldsymbol{x}$$

```
plot(cars)
```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