

# INF3490/INF4490 Exercises - Week 3

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$\mathbb{P}$  marks the programming exercises, we strongly recommend using the python programming language for these. Exercises may be added/changed after publishing.

## 1 Pareto Optimality

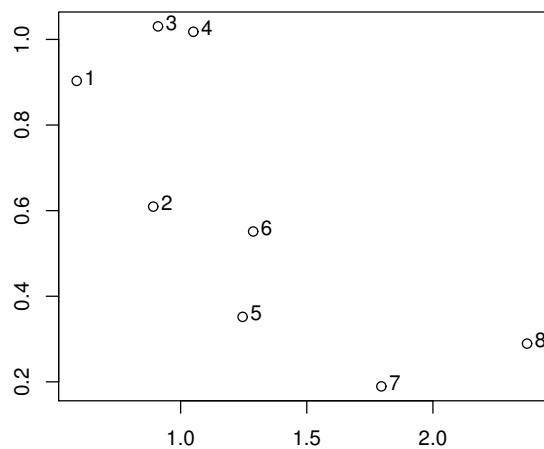


Figure 1: a

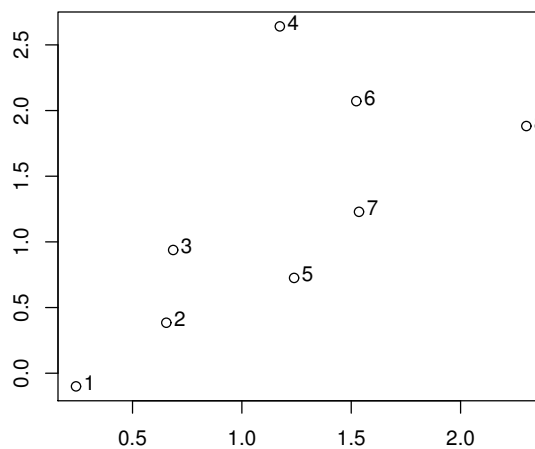


Figure 2: b

For figure a and b above, find the Pareto optimal set when

- Minimizing both  $f_1$  and  $f_2$
- Minimizing  $f_1$ , maximizing  $f_2$
- Maximizing  $f_1$ , minimizing  $f_2$
- Maximizing both  $f_1$  and  $f_2$

## 2 Weighted sum

In figures a and b, what would be the maximum point when using weighted sum:

- $w_1 = 1, w_2 = 1$
- $w_1 = -1, w_2 = 1$

## 3 Hybrid Algorithm

Why can hybrid algorithms make it harder to maintain diversity?

## 4 Measuring algorithm performance

Why is it usually better to use the number of fitness function evaluations as a time measure, rather than the number of generations, or the amount of CPU time spent?

### Corrections and suggestions

Corrections of grammar, language, notation or suggestions for improving these exercises are appreciated. E-mail me at: **olehelg@uio.no** or use **GitHub** to submit an issue or create a pull request.