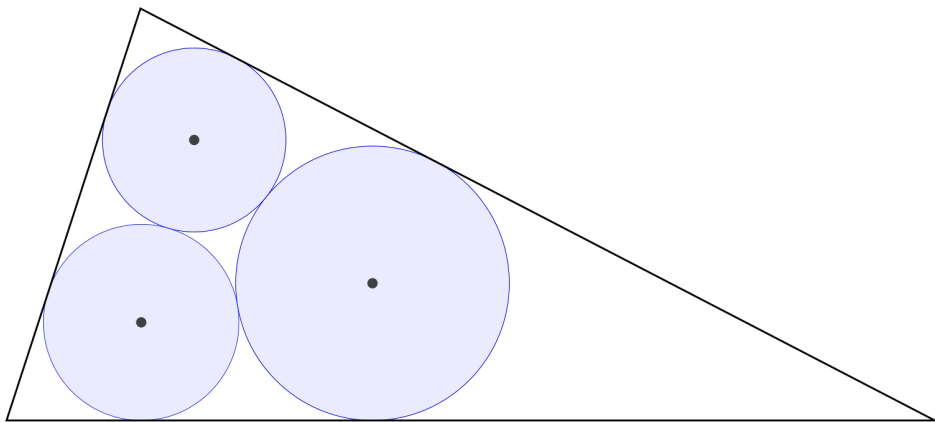**What is...a greedy algorithm?**
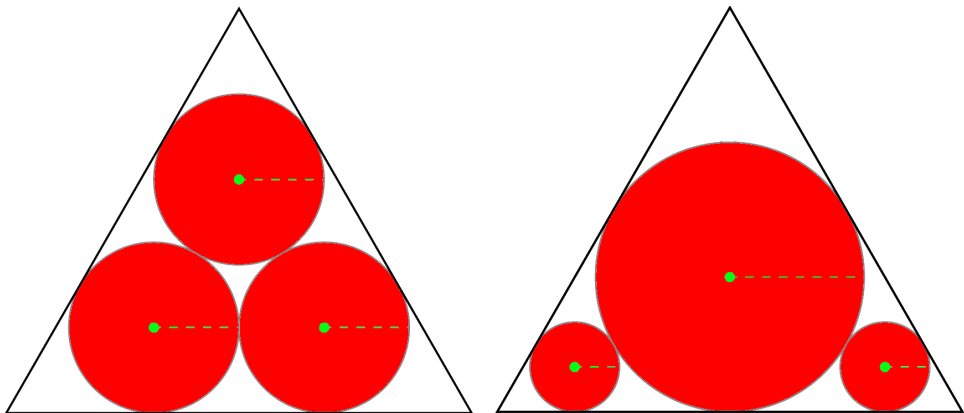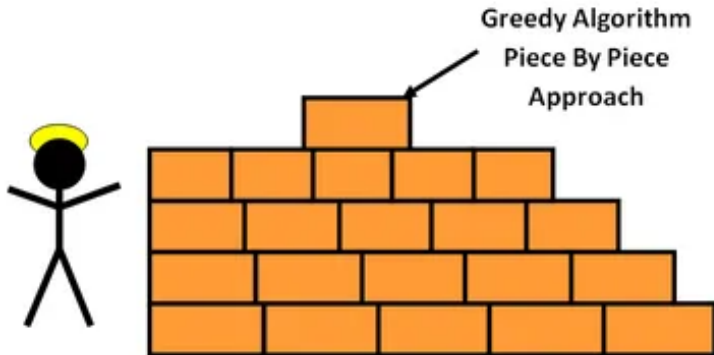

Or: Greed is good! Well...

Malfatti circles

- ▶ Put three circles inside a given triangle
- ▶ Each circle is tangent to the other two
- ▶ Each circle is tangent to two sides of the triangle
- ▶ Problem What configuration maximizes the area of the circles?

The biggest first

- ▶ The left areas are ≈1% smaller than the right
- ▶ The right is an optimal solution
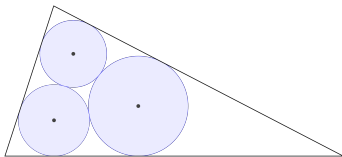- ▶ Construction: place the biggest possible circle at a time Greedy!

- Strategy Optimize locally and hope for a globally optimal result
- A typical strategy of humans ;-)
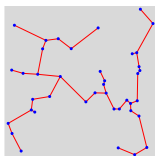- In the circle example this strategy works!

In the following examples the greedy strategy works :

► The Malfatti problem
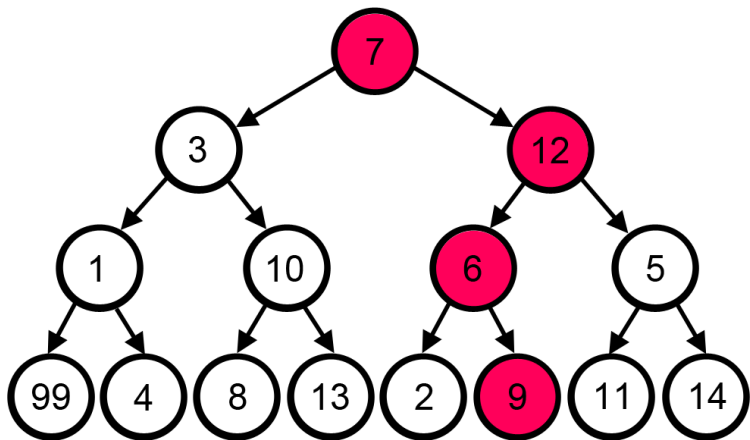

► Selection Sort
► Knapsack Problem
► Minimum Spanning Tree

► Many more

Greed is good! Well...

- "Most" of the time greedy strategies fail to produce optimal results
- Above non-example: maximize the total sum of the vertices
- It is remarkable and rare when a greedy strategy works

Thank you for your attention!

I hope that was of some help.