

GC 2021.1 - Exercício 3

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Implementação

- Python
- Jupyter Notebook
- Numpy
- Matplotlib



Questão 2 - Graham

The diagrams illustrate the turn logic in the Graham scan algorithm. Each diagram shows a set of points with a red path (previous, current, next) and dashed lines representing other potential edges. The diagrams show how a left turn leads to accepting a point and a right turn leads to rejecting it.

Top row:

- Diagram 1: (p, c, n) is a left turn, accept c
- Diagram 2: (p, c, n) is a right turn, reject c
- Diagram 3: (p, c, n) is a left turn, accept c

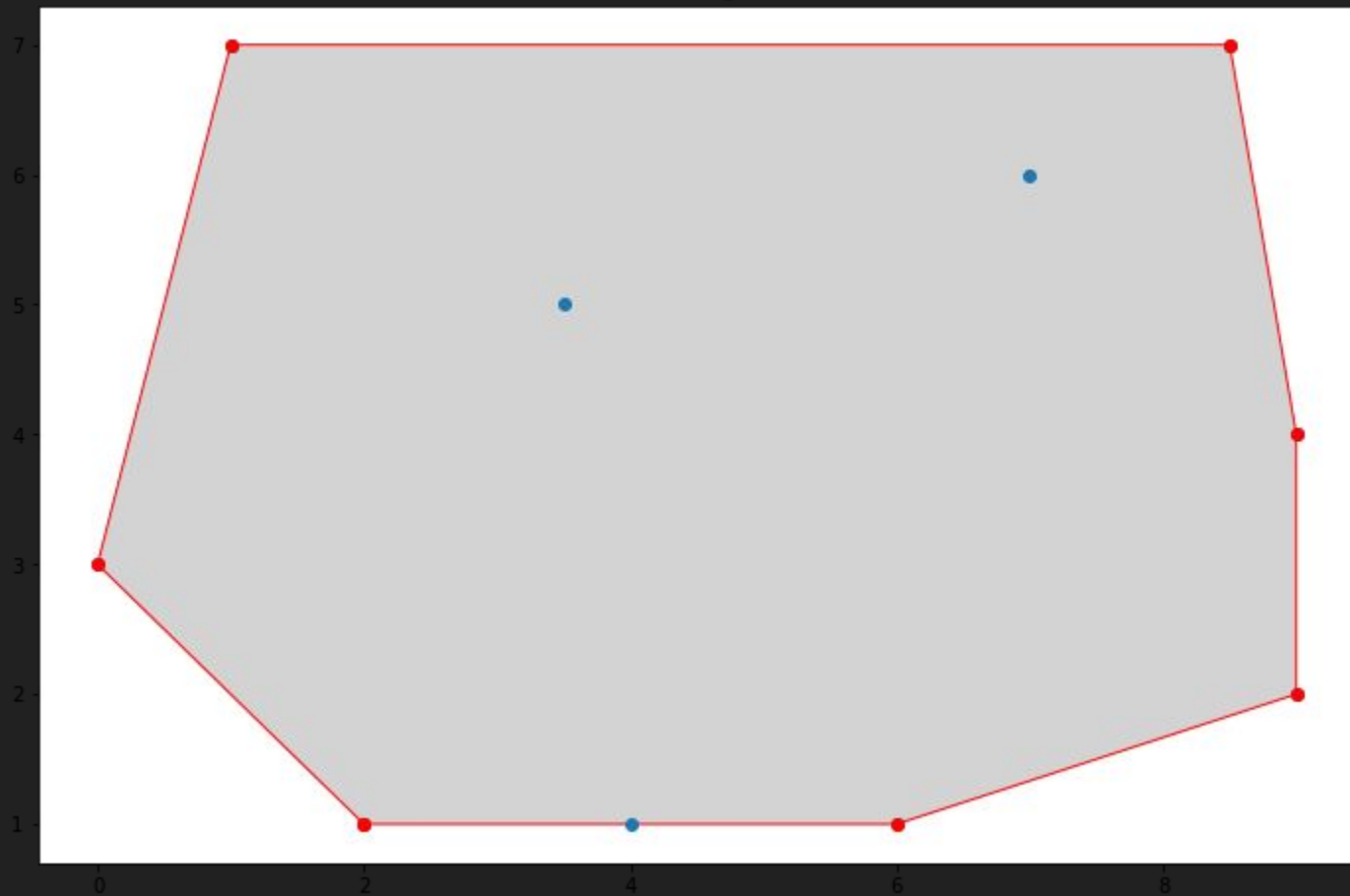
Bottom row:

- Diagram 4: (p, c, n) is a left turn, accept c
- Diagram 5: (p, c, n) is a right turn, reject c
- Diagram 6: (p, c, n) is a left turn, accept c

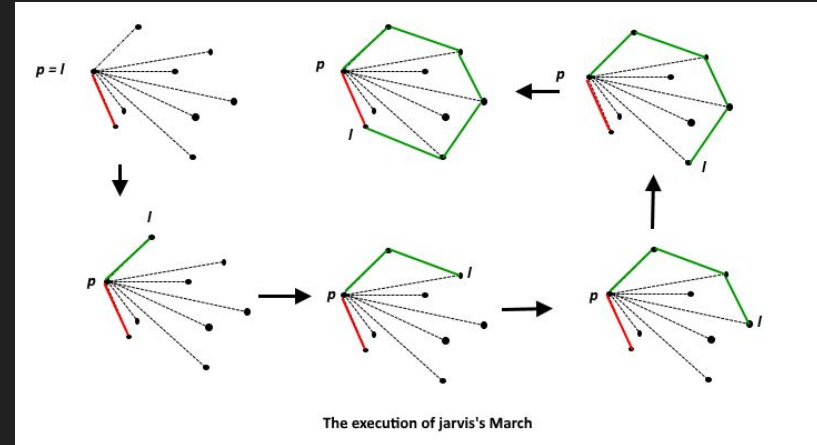
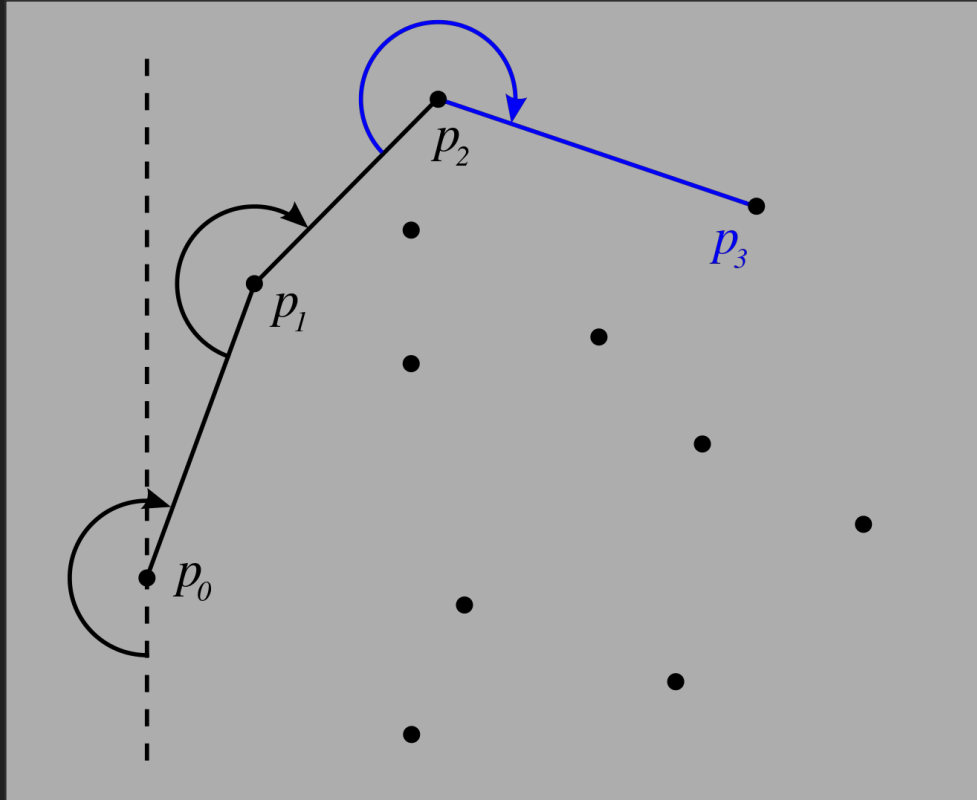
P : previous c : current n : next

In the above algorithm and below code , a stack of points is used to store convex hull points. With reference to the code , p is next-to-top in stack, c is top of stack and n is $point[i]$

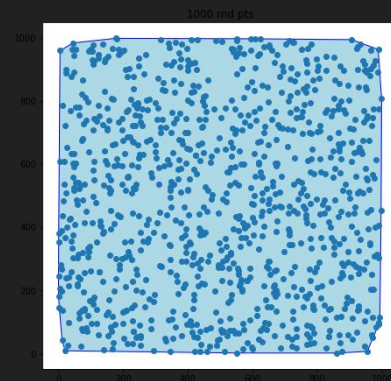
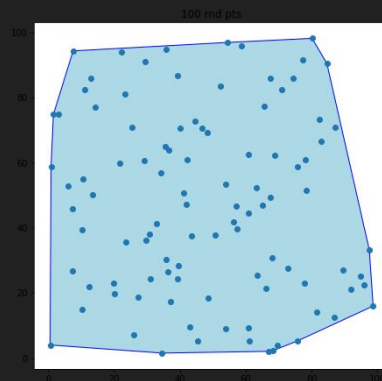
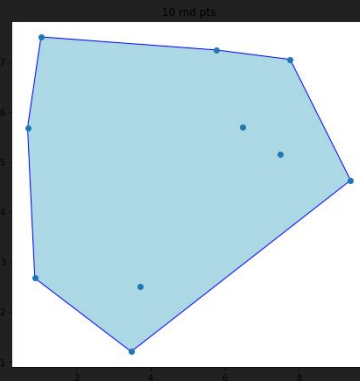
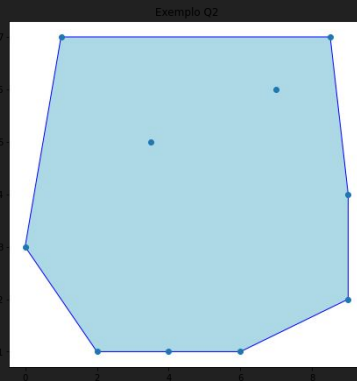
Graham's algorithm



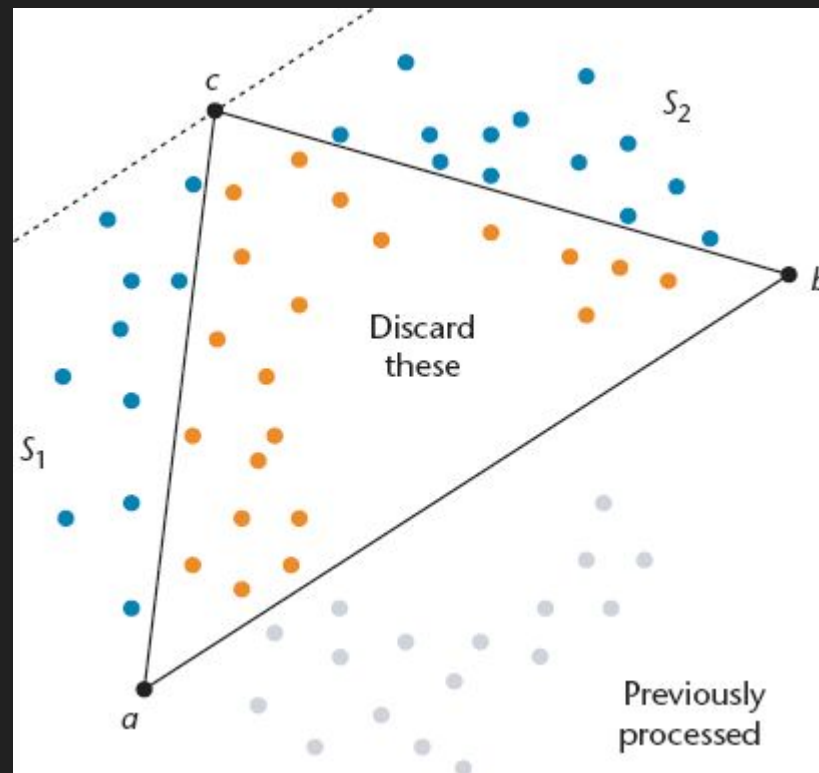
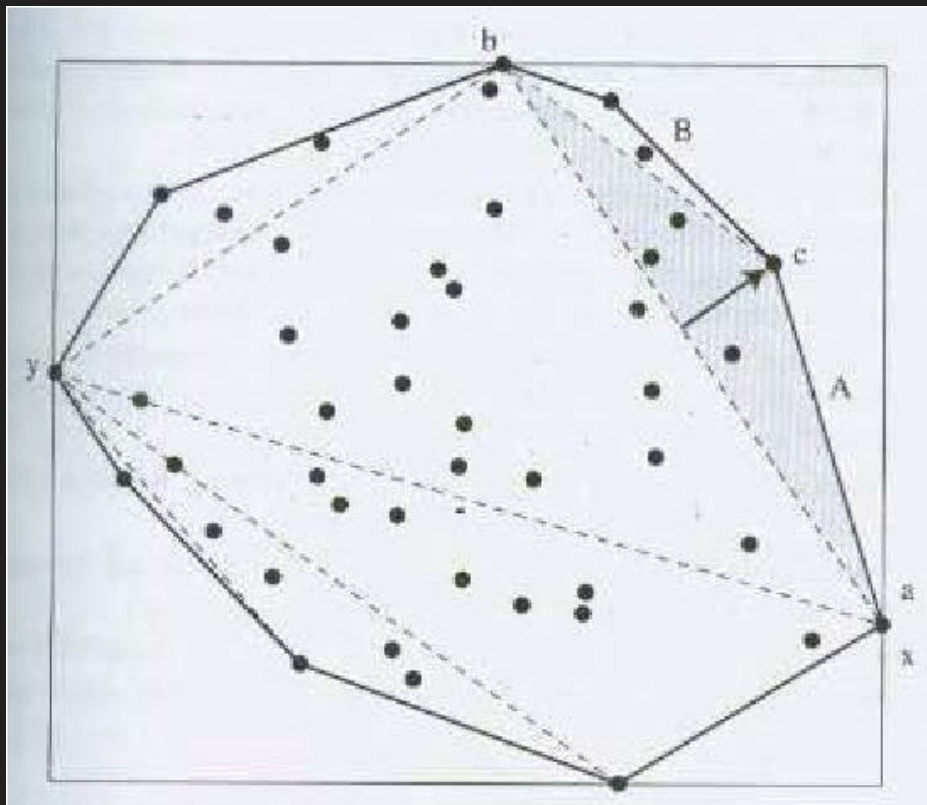
Questão 3 - Jarvis



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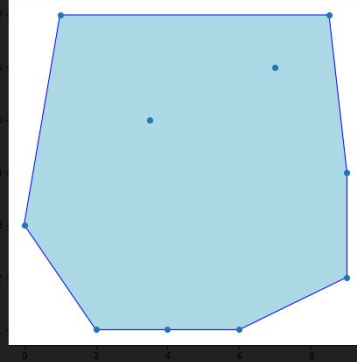


Questão 4 - Quickhull

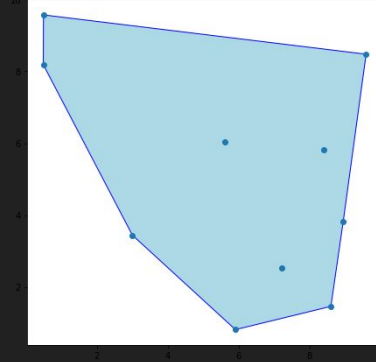


Questão 4 - Quickhull

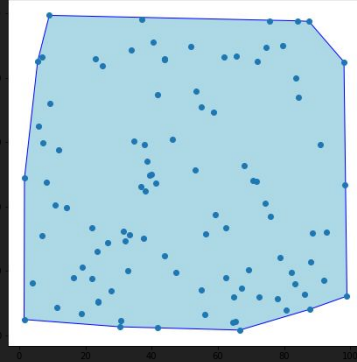
Example Q2



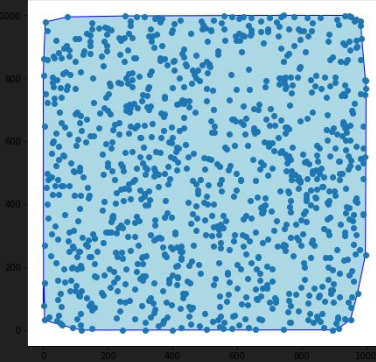
10 rand pts



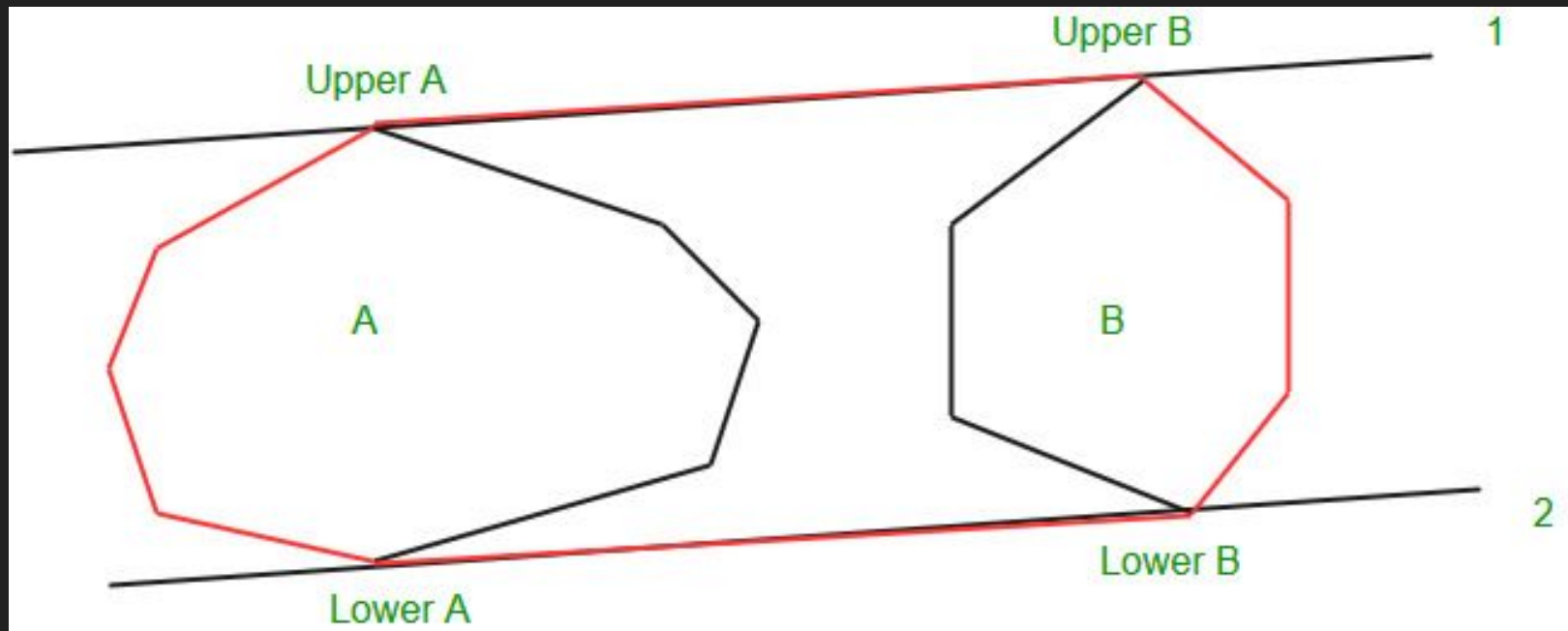
100 rand pts



1000 rand pts

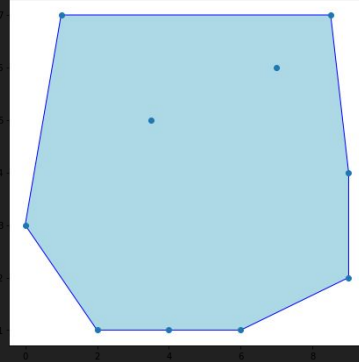


Questão 5 - Mergehull

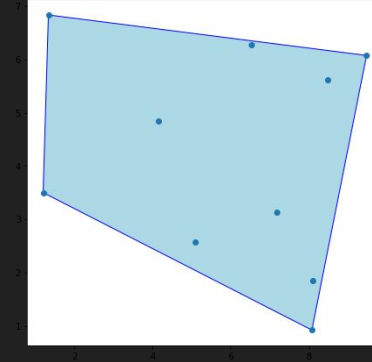


Questão 5 - Mergehull

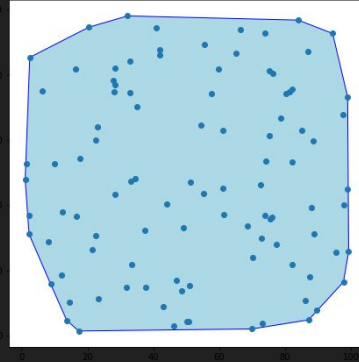
Example Q2



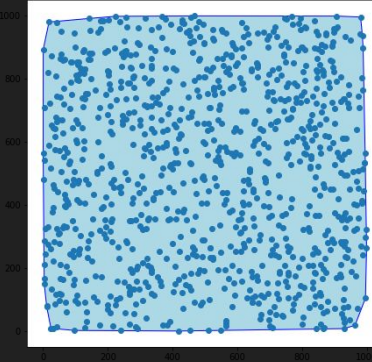
10 rnd pts



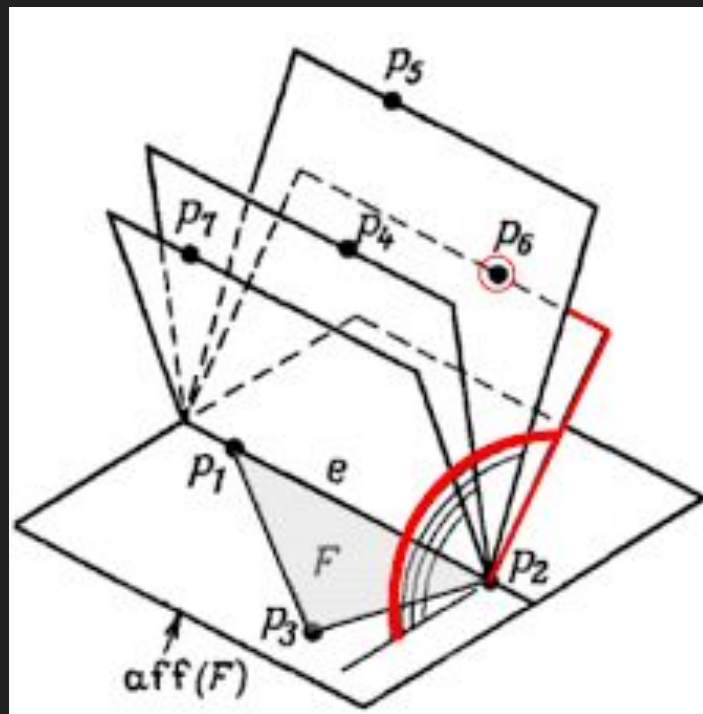
100 rnd pts



1000 rnd pts



Questão 6 - Embrulho para presente



A Gift wrapping and a QuickHull example

