EMNE Exercise Solutions - Week 1

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February 1, 2017

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

Simple search algorithms

Given task

Derivative

Question
Answer:

$\mathbb{P}$ Plotting

Given task for plotting:
Plot:

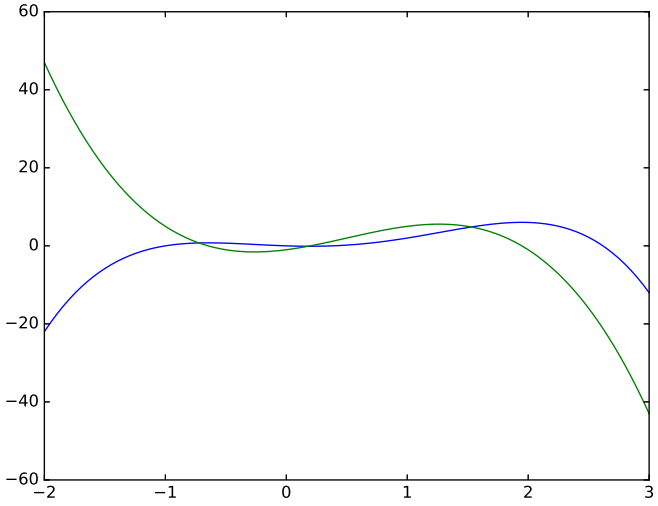

Figure 1: $f(x)$ and it's derivative.

Source code (Python 3): Source code if needed

$\mathbb{P}$ Gradient Ascent

Given question
Answer:
answer with list, plot and code:
Both starting position and step size affects where the algorithm ends:

- Starting Position

  - *Left side:* Should converge on left maximum
  - *Center:* Stops immediately, gradient is zero.
  - *Right side:* Should converge on right maximum

- Step Size
  - *Too low:* Converges slowly (poor performance)
  - *Too high:* Overshoot, bounce over solutions. Doesn't converge, might not terminate.

Plot:

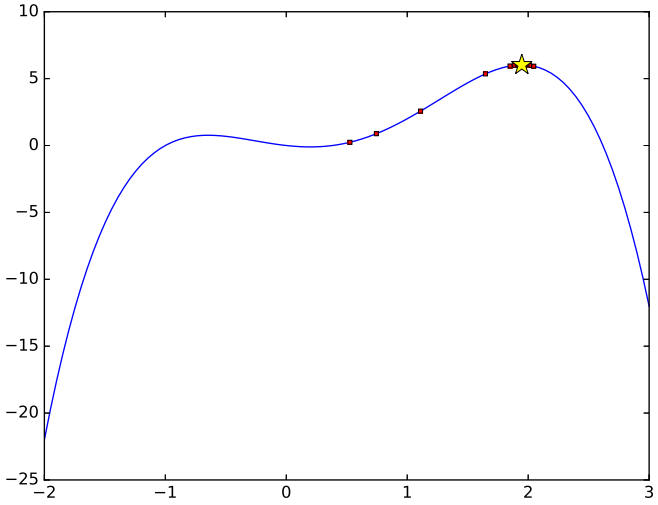

Figure 2: Result of gradient ascent

Source code (Python 3):