

Labwork 1: Gradient Descent

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1 Implement the algorithm

- `gradient_d(x, L, stop)` has 3 parameters: x = initial state, L = Learning Rate, $stop$ = stopping the algorithm when $f(x) < stop$.
- Updates the value of x using the gradient descent formula: $x = x - L * f'(x)$.
- Print the intermediate iterative steps
- Continues until the value of $f(x)$ falls below the stop threshold.

2 Different learning rate L

I use initial state = -2 and stop when $f(x) < 0.001$

- $L = 0.01$: The algorithm took 206 steps
- $L = 0.1$: The algorithm took 19 steps
- $L = 1$: The algorithm loops infinitely at $x = 2$ and $x = -2$
- $L = 10$: The algorithm never converge, $f(x)$ float overloads.