

Homework 2

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Task 1: implement the gradient descent algorithm

Run gradient descent to find the minima of the following function:

$$g(w) = \frac{1}{50} * (w^4 + w^2 + 10 * w)$$

1. Value of the cost function ($g(w)$) and the derivative of the cost function at $w_0 = 2$.

```
[Ojianhuang@JianHuang 17:50:49 .../hw2  
$ python hw2.py  
run task 1 ...  
Cost of w0=2: 0.8  
Gradient of w0=2: 0.92
```

Figure 1: Value of cost function and derivative at $w_0 = 2$

2. Cost function history from three different steplength runs.

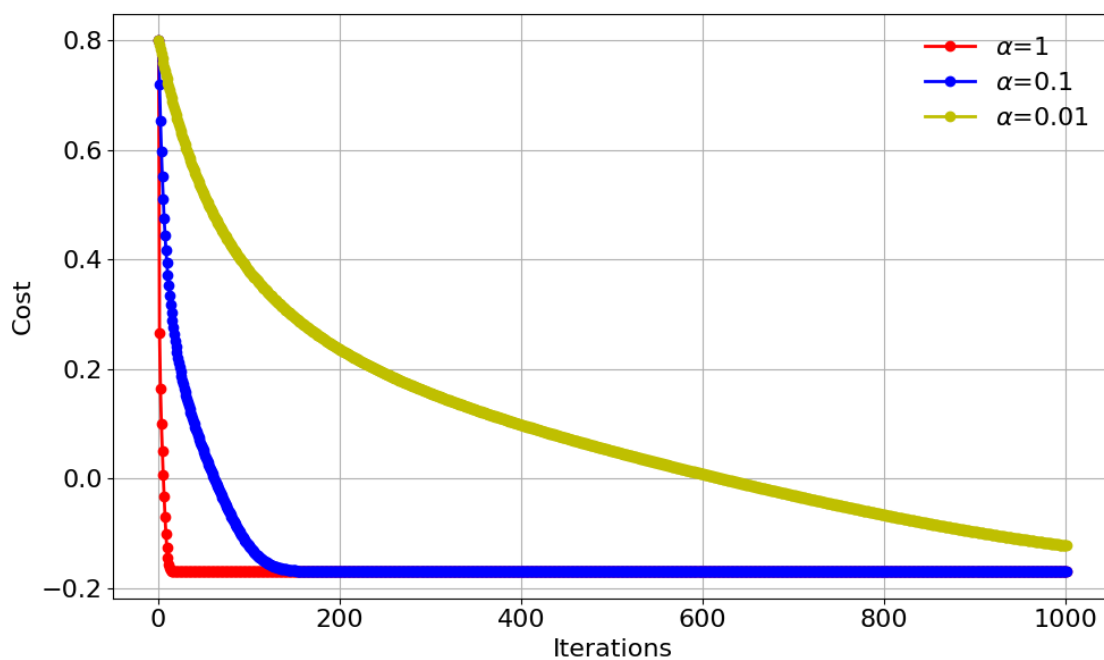


Figure 2: cost functions of different α

Task 2: Compare fixed steplength and diminishing gradient descent

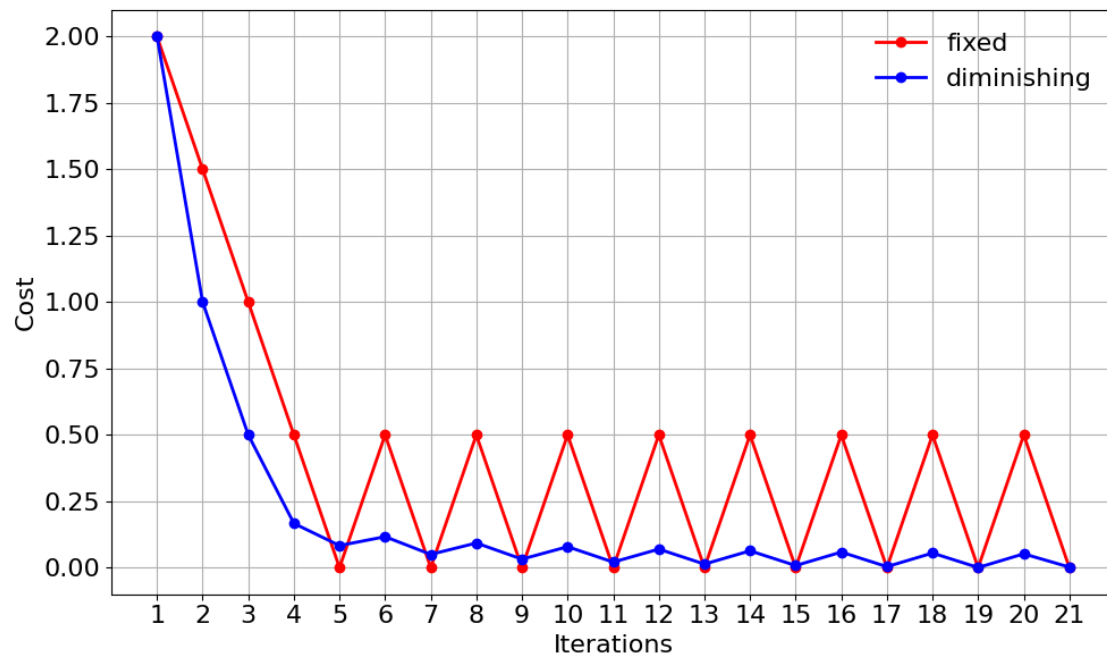


Figure 3: Fixed Vs Diminishing