

Implement Gradient Descent Algorithm to find the local minima of a function. For example, find the local minima of the function  $y=(x+3)^2$  starting from the point  $x=2$

```
In [33]: x=2 #start
lr=0.01 #Learning rate
precision = 0.000001
previous_step_size = 1
max_iter = 10000
iters =0
gf = lambda x: (x + 3) ** 2
```

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In [34]: import matplotlib.pyplot as plt
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In [37]: gd=[]
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```
In [38]: while precision < previous_step_size and iters < max_iter:
    prev = x
    x = x- lr * gf(prev)
    previous_step_size = abs(x - prev)
    iters += 1
    print('Iteration',iters,'Value',x)
    gd.append(x)

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Iteration 282 Value -2.6718600180988314
Iteration 283 Value -2.6729367765760523
Iteration 284 Value -2.674006480097217
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In [39]: print('Local Minima:',x)
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Local Minima: -2.990001240409911

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In [44]: plt.plot(range(len(gd)), gd)
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Out[44]: [<matplotlib.lines.Line2D at 0x1dd9c056cd0>]
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