fit_beispiel

April 11, 2023

[1]:
```
import numpy as np
import matplotlib.pyplot as plt
from scipy.optimize import curve_fit
```

[5]:
```
[x,y] = np.loadtxt('newdata.txt', delimiter=',',unpack=True)
```

[6]:
```
x
```

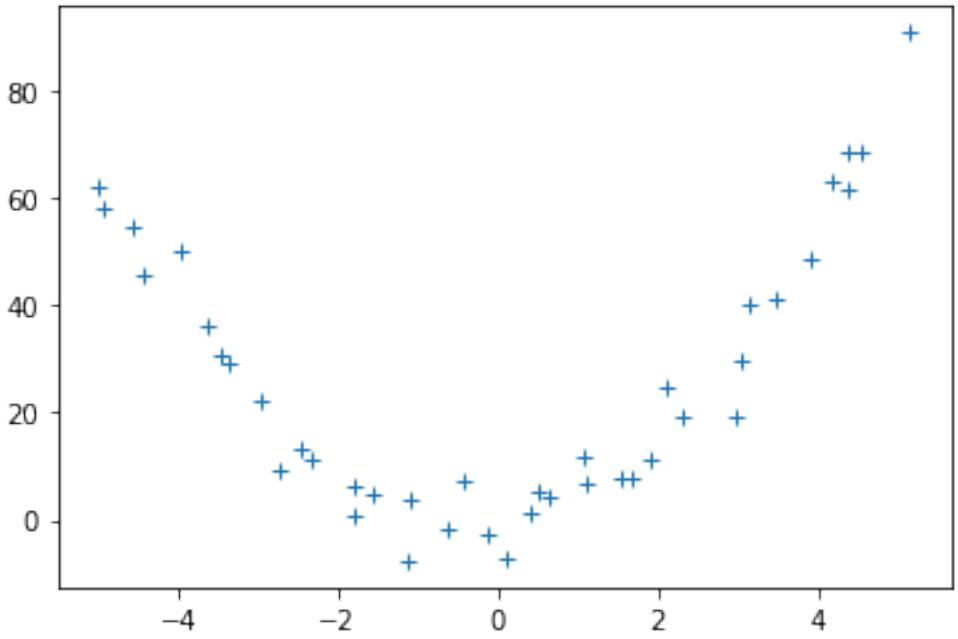
[6]:
```
array([-4.91, -4.99, -4.56, -4.42, -3.95, -3.64, -3.45, -3.36, -2.95,
       -2.72, -2.47, -2.32, -1.79, -1.79, -1.54, -1.12, -1.1 , -0.61,
       -0.41, -0.12,  0.11,  0.42,  0.51,  0.64,  1.1 ,  1.08,  1.53,
        1.69,  1.91,  2.11,  2.31,  2.98,  3.03,  3.16,  3.47,  3.91,
        4.19,  4.37,  4.39,  4.56,  5.16])
```

[7]:
```
y
```

[7]:
```
array([58.02, 62.18, 54.73, 45.48, 50.21, 36.07, 30.71, 28.95, 22.16,
        9.45, 13.35, 11.18,  0.54,  6.39,  4.93, -7.65,  3.53, -1.85,
        7.16, -2.93, -6.99,  1.04,  5.49,  4.4 ,  6.96, 11.86,  7.94,
        7.76, 11.11, 24.62, 19.17, 18.98, 29.88, 40.36, 41.12, 48.48,
       62.81, 68.63, 61.52, 68.38, 90.79])
```

[10]:
```
plt.plot(x,y,'+')
```

[10]:
```
[<matplotlib.lines.Line2D at 0x7f603358a390>]
```



[11]:
```
def parabel(x,a,b,c):
    return a*x**2 + b*x + c
```

[13]:
```
popt, pcov = curve_fit(parabel,x,y)
```

[18]:
```
[a,b,c]=popt
```

[15]:
```
pcov
```

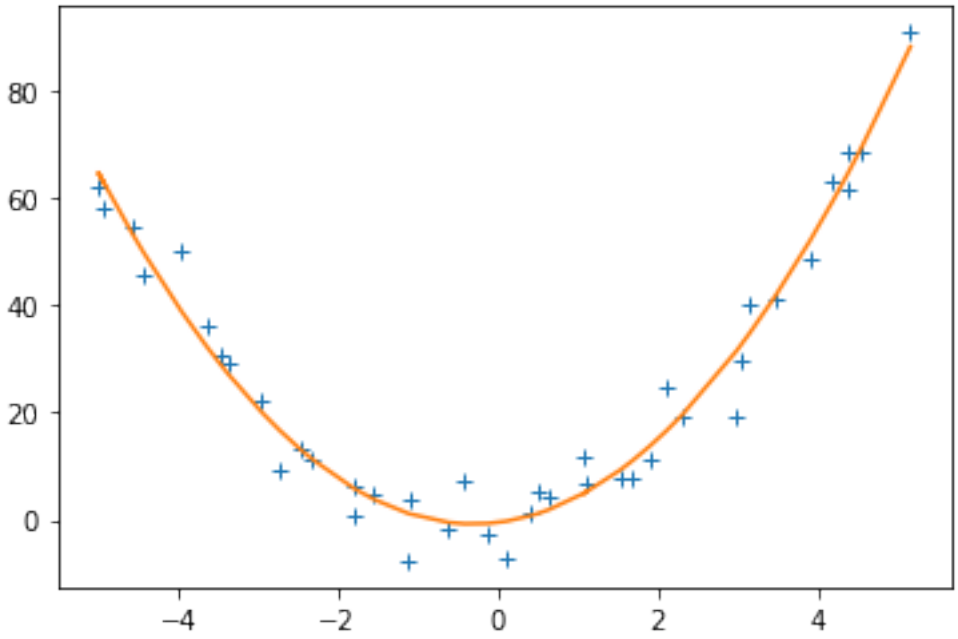
[15]:
```
array([[ 8.87241847e-03,  1.56958859e-04, -7.81986297e-02],
       [ 1.56958859e-04,  6.50701549e-02, -2.03406435e-03],
       [-7.81986297e-02, -2.03406435e-03,  1.26268863e+00]])
```

[17]:
```
np.sqrt(np.diag(pcov))
```

[17]:
```
array([0.09419352, 0.25508852, 1.12369419])
```

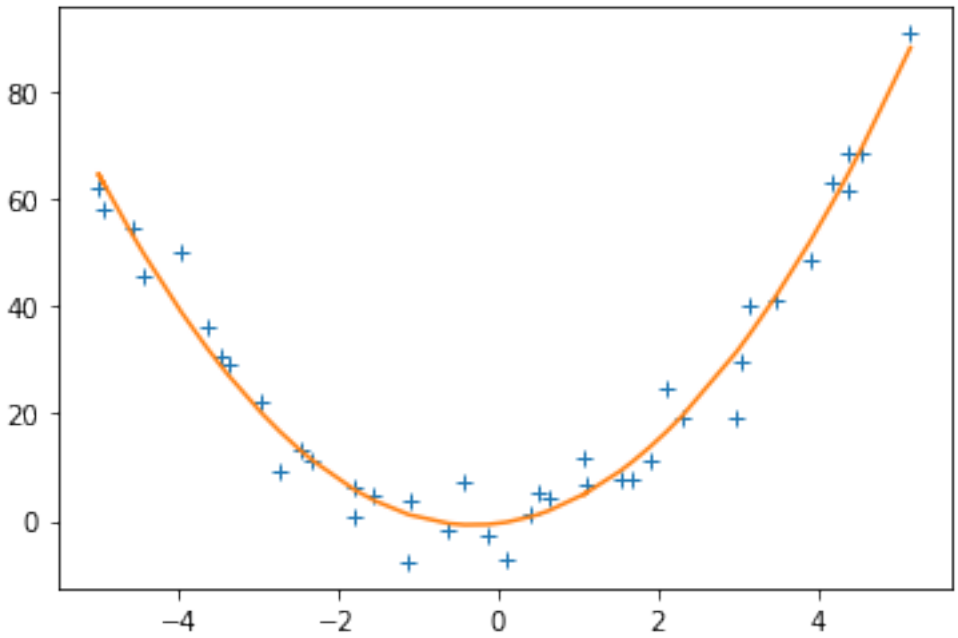
[20]:
```
plt.plot(x,y,'+')
plt.plot(x,parabel(x,a,b,c))
```

[20]:
```
[<matplotlib.lines.Line2D at 0x7f6031513110>]
```



[21]:
```
plt.plot(x,y,'+')
plt.plot(x,  parabel(x,*popt))
```

[21]: [<matplotlib.lines.Line2D at 0x7f603147b290>]



[ ]: