Q4

November 21, 2021

[46]:
```
%run lib.ipynb
```

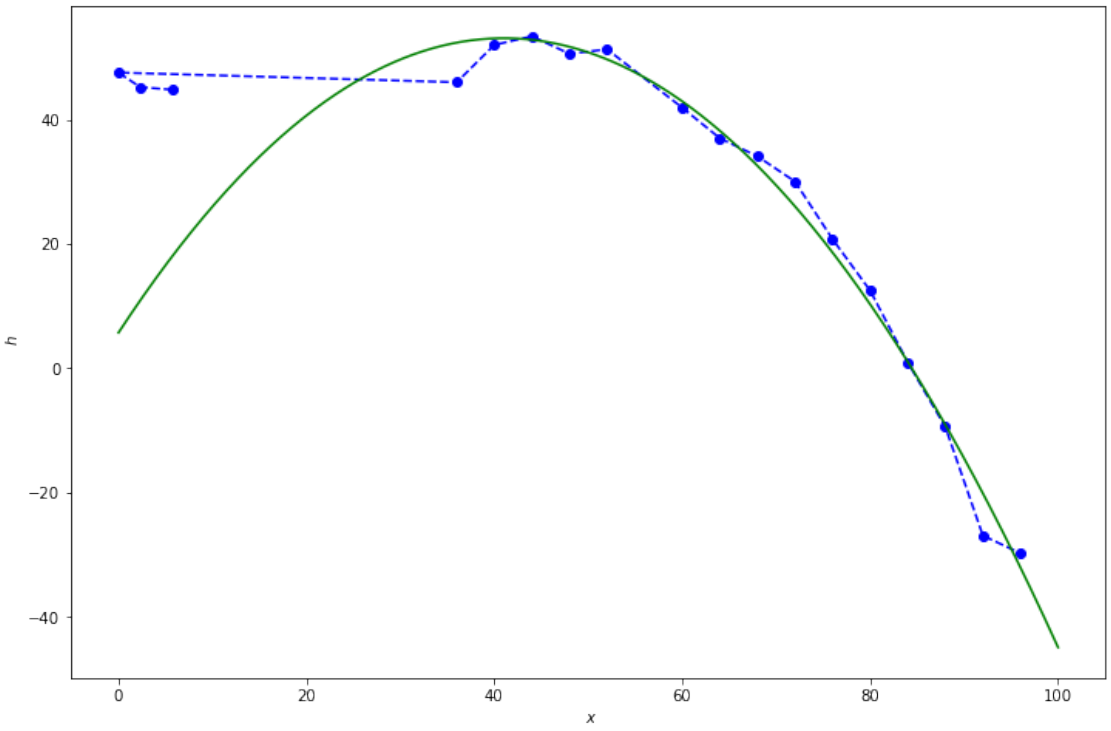
[47]:
```
file='fit2.csv'
x,y=read_csv(file)
degree=2
solution=polyfit(x,y,degree)
print("Coefficients of the fitted polynomial are")
print(solution)

print("\nPearson coefficient = "+str(Pearson_coeff(x,y)))
```

```
Coefficients of the fitted polynomial are
[5.7241062860246394, 2.31001829870581, -0.028162602079190243]

Pearson coefficient = 0.3970463157093367
```

[48]:
```
#highest point occurs at r = -a1/2a2
r_high = (-2.31001829870581)/(2*(-0.028162602079190243))
print(r_high)
h_max = 5.7241062860246394 + 2.31001829870581*r_high - 0.
 ↪028162602079190243*(r_high**2)

print("Maximum height reached = " + str(h_max))
```

```
41.012160243756675
Maximum height reached = 53.09352660229106
```

[49]:
```
t = np.linspace(0,100,30000,endpoint= True)
s = 5.7241062860246394 + 2.31001829870581*t - 0.028162602079190243*(t**2)
plt.figure(figsize = (12, 8))
plt.plot(x,y,'bo--')
plt.plot(t,s,'g', label='Precise Soln')
plt.xlabel(" $x$")
plt.ylabel(" $h$")
plt.show()
```


40
20
0
−20
−40
h
0
20
40
60
80
100
x