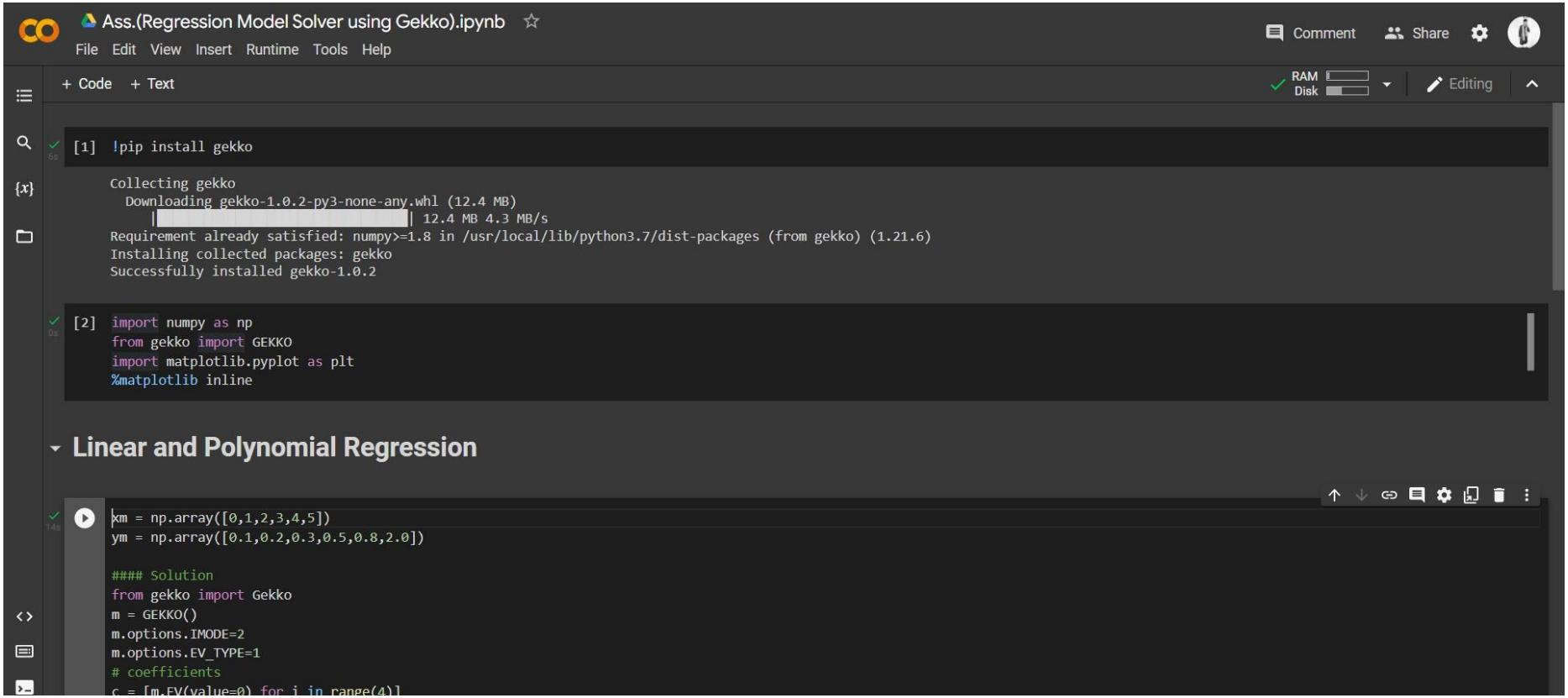
Himanshu Sharma
201550062

Regression Model Solver Using Gekko



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```
# quadratic
c[2].STATUS=1
m.solve(disp=False)
p2 = [c[2].value[0],c[1].value[0],c[0].value[0]]

# cubic
c[3].STATUS=1
m.solve(disp=False)
p3 = [c[3].value[0],c[2].value[0],c[1].value[0],c[0].value[0]]

# plot fit
plt.plot(xm,ym,'ko',markersize=10)
xp = np.linspace(0,5,100)
plt.plot(xp,np.polyval(p1,xp),'b--',linewidth=2)
plt.plot(xp,np.polyval(p2,xp),'r--',linewidth=3)
plt.plot(xp,np.polyval(p3,xp),'g:',linewidth=2)
plt.legend(['Data','Linear','Quadratic','Cubic'],loc='best')
plt.xlabel('x')
plt.ylabel('y')
print(p1)
```

```
[0.19999999995, 9.7190732222e-11]
```

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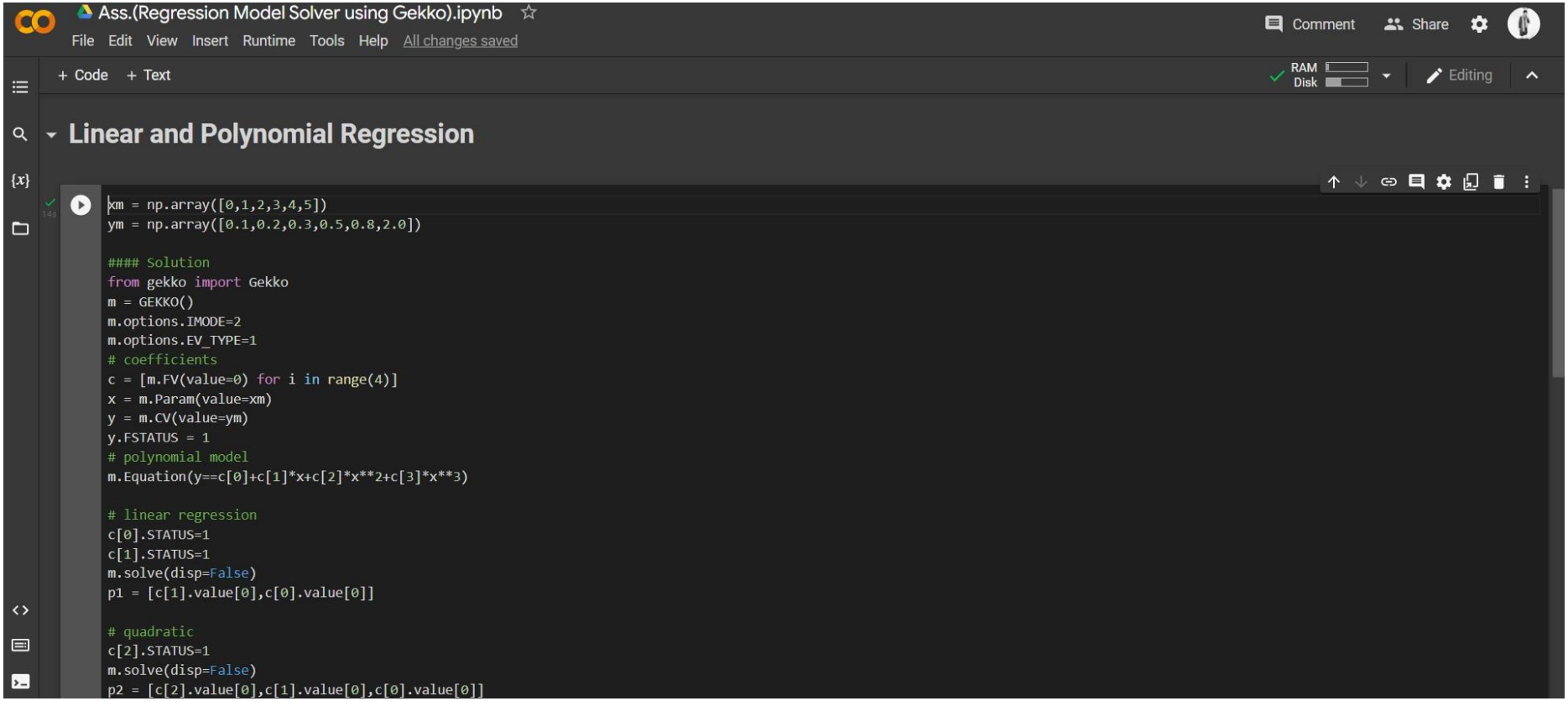

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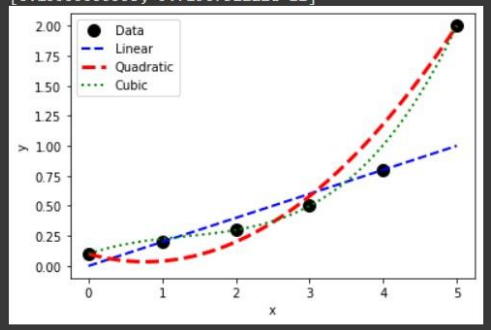

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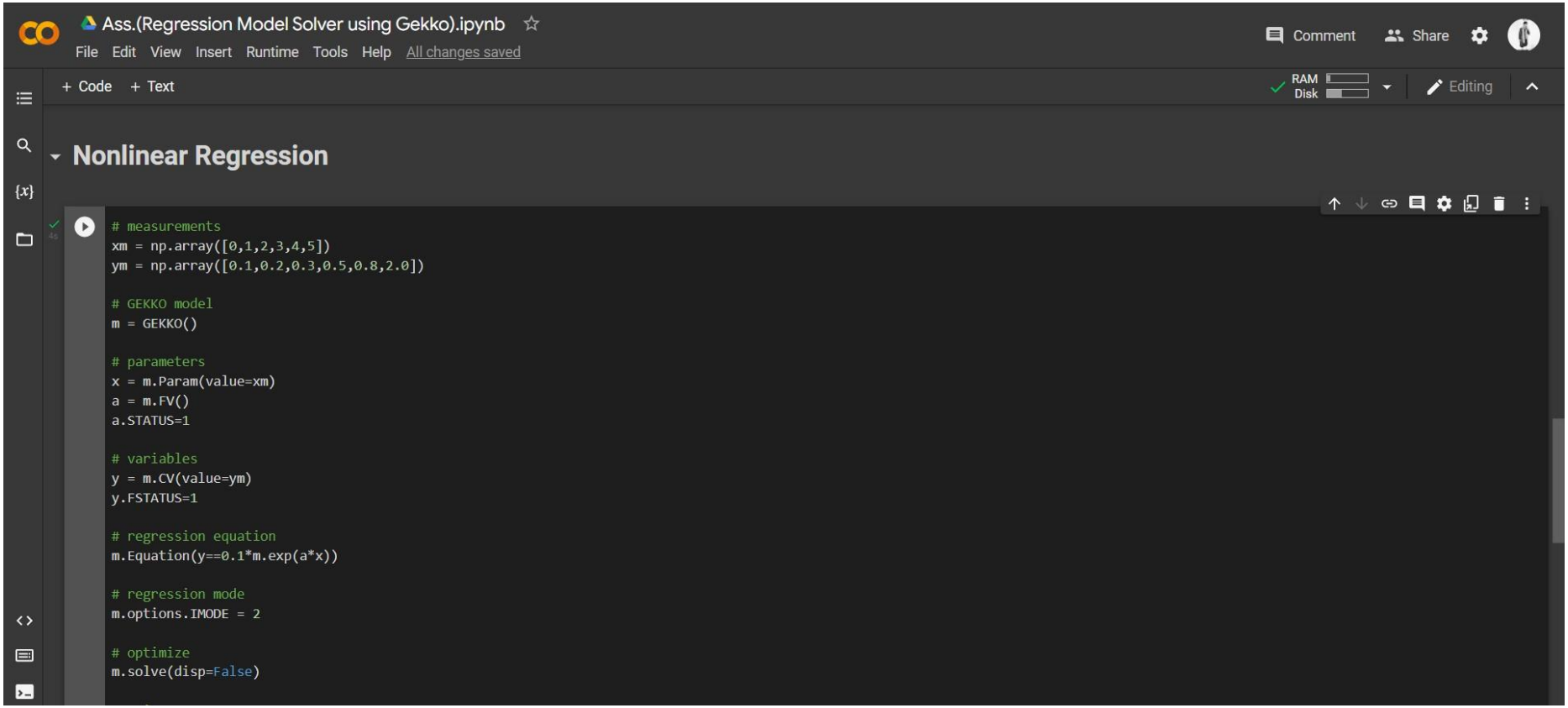

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```
# regression equation
m.Equation(y==0.1*m.exp(a*x))

# regression mode
m.options.IMODE = 2

# optimize
m.solve(disp=False)

# print parameters
print('Optimized, a = ' + str(a.value[0]))

plt.plot(xm,ym,'bo')
plt.plot(xm,y.value,'r-')
```

```
Optimized, a = 0.59909644843
[<matplotlib.lines.Line2D at 0x7f035c818750>]
```