Total Marks: 30 **Name____** Total Time: 20 mins

I. [2 pts.] In Modeling and Simulation we convert __________equation________ into ________data_____________.

II. [2 pts.] In Data Mining we convert __________data_______________ into________equation_________________.

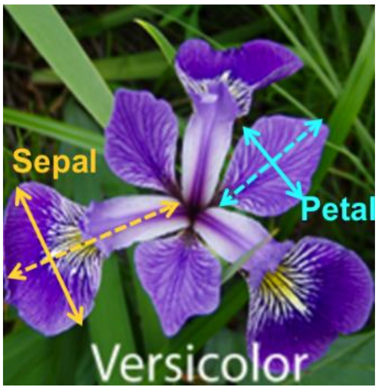
III. [2 pts.] In the equation of the regression line Y = 1.2 X – 3.4, slop is ___1.2_____ and y-intercept is _____-3.4___.

IV. [2 pts.] The equation of the regression line is Y = 1.2 X – 3.4, predict the Y when X = 5 ______2.6______________.

V. [2 pts.] The equation of the regression line is equation Y = 1.2 X – 3.4. The residual for the point (7, 6) is ____1____.

VI. [10 pts.] Consider following data set representing width (W) and length (L) of Iris Versicolor Petal. Perform linear regression to construct a model representing relationship between W and L.

W	L
3	4.5
3.2	4.7
3.5	5
3.6	5.1



Regression Equation(y) = $w_0 + w_1 x$

Slope(w_1) = $(N\Sigma XY - (\Sigma X)(\Sigma Y)) / (N\Sigma X^2 - (\Sigma X)^2)$

Intercept(w_0) = $(\Sigma Y - b(\Sigma X)) / N$

ΣX = 13.3 ΣY = 19.3

ΣXY = 64.4 ΣX^2 = 44.45 $(\Sigma X)^2$ = 176.89

Slope(w_1) = (4 x 64.4 – 13.3 x 19.3) / (4 x 44.45 – 176.89) = 1.0

Intercept(w_0) = (19.3 – 1 x 13.3) / 4 = 1.5

y = 1.5 + x or L = W + 1.5

VII. [10 pts.] Consider the above data. Perform stochastic gradient descent for simple linear regression for first instance assuming w_0 = 0.5, w_1 = 0.25 and learning rate = 0.25.