Quiz 2

DATA MINING, SPRING 2019

Name: UID:

Problem 1.(1=.5+.5 points.) Key
What is the support of 1D and 2D Gaussian distribution.

Support (1D Gaussian) $\mathbb{R}$

Support (2D Gaussian) $\mathbb{R}^2$ set of tuple (pair) of all real numbers

Problem 2.(1 points) Can you sketch sigmoid function $\sigma(x) = \frac{1}{(1+\exp(-x))}$ where $x \in \mathbf{R}$ used in Logistic regression. Please label some points along the y axis.

Problem 3.(1.5= .5+1 points)
a) If random variables X, Y are conditionally independent given random variable Z then $P(X, Y|Z) =$?

b) We know that conditional independent for above variable also means $P(Y|Z) = P(Y|X, Z)$. Using this definition can you show $P(X, Y|Z) = P(X|Z)P(Y|Z)$.

$P(X, Y|Z) = P(X|Z)\, P(Y|X, Z)$ chain rule of probability in the universe of Z

$= P(X|Z)\, P(Y|Z)$ $\because$ given $P(Y|Z) = P(Y|X, Z)$