**CAP 4630 HW-1 Written Questions**

(1) (2 points) If the product for the following two matrices is **elementwise product**, what's the result of the following computing? You should assume broadcasting is valid here, so the computation is well-defined. You may use NumPy to help check the result, but you should know how to do it manually.

A number and a number

Description automatically generated with medium confidence

*Red is result of broadcasting*

(2). (2 points) If the product for the following two matrices is **dot-product**, what's the result of the following computing? You should assume broadcasting is valid here, so the computation is well-defined.

A number and a number

Description automatically generated with medium confidence

(3). (2 points) If both products for the following are **dot-product**, what's the result of the following computing?

A close-up of numbers

Description automatically generated

(4). (2 points) Given the following equations and *x=1, w=2*, what is the value of ▽wl ?

A math equations with numbers

Description automatically generated with medium confidence

(5). (2 points) From above equations, if we want to minimize *l* by changing *x* with gradient descent. With the learning rate is 0.01, what is the value of *x* after one iteration?