Assignment (Due: Nov. 26, 2017)

1. (**Math**) In our lecture, we mentioned that for logistic regression, the cost function is,

$$J(\theta) = -\sum_{i=1}^{m} y_i \log\left(h_\theta(x_i)\right) + (1 - y_i)\log\left(1 - h_\theta(x_i)\right)$$

   Please verify that the gradient of this cost function is

$$\nabla_\theta J(\theta) = \sum_{i=1}^{m} x_i \left(h_\theta(x_i) - y_i\right)$$

2. (**Programming**). Object detection and recognition based on CNN now can achieve amazing results. In this task, you are required to implement a "cup" detection system, which can locate accurately the cup(s) in a given image. For object detection framework, you can use Faster-RCNN, SSD, or YoloV2.