

## Quiz 2

MACHINE LEARNING, SUMMER 2019

Name:

UID:

**Problem 1.**(2 =.5+1+.5+.5 points.)

1a. If prior is uniform then MAP and MLE estimate are same. (TRUE/FALSE)  
(True/False)

TRUE, prior term is constant.  
Doesn't affect MAP estimation

1b. Let say we want to find parameters  $\hat{\theta}$  which maximize a function  $f(\theta)$ ., i.e  $\hat{\theta} = \arg \max_{\theta} f(\theta)$ . Circle the right option.

(a)  $\hat{\theta}$  is same as  $\arg \max_{\theta} 3^{f(\theta)}$

(b)  $\hat{\theta}$  is same as  $\arg \max_{\theta} \log(f(\theta))$

☒ (c) Both (a) and (b)

1c. Show that  $\frac{v}{\|v\|_2}$  is a vector of unit length where  $v \in \mathbb{R}^d$ .

$$\left\| \frac{v}{\|v\|_2} \right\|_2 = \frac{1}{\|v\|_2} \|v\|_2 = 1$$

1d. In Gaussian discriminant analysis, what kind of decision boundary we get if class co-variance matrices are same between two classes.(Just write one word)

Linear