Quiz

Variant 1

1) Some problems in machine learning can be classified as supervised learning or unsupervised learning. Which of the following of the following tasks you will apply unsupervised learning algorithms ?

- Given data about weather in the previous days, predict tomorrow's weather.
- **Given data from experiment about testing drug (effectiveness of treatment). Define categories or "types" of patients in terms of their response to the drug.**
- **Examine a large collection of emails that are known to be spam email, to discover if there are sub-types of spam mail.**
- Given 50 articles written by male authors, and 50 articles written by female authors, learn to predict the gender of a new manuscript's author (when the identity of this author is unknown).

2) Classify the problem. Use a learning algorithm to predict whether the US Dollar will go up against the Euro tomorrow.

- **Classification**
- Regression

3) Given such a dataset of students' scores (1-5) and how many hours they do their work.

Hours (X)	Score (y)
3	3
3	4
4	3
1	0

Here each row is one training example. Recall linear regression, our hypothesis is **theta0** + **theta1** * **X**, and we use **m** to denote the number of training examples.

For the training set above, what is the value of **m** ?

- 4

Formula of cost function is

$$J(\theta) = \frac{1}{2m} \sum_{i=1}^{m} \left(h_\theta(x^{(i)}) - y^{(i)} \right)^2$$

.

Define J(1,1): **1.625**

What is H(1), if theta0 = 2 and theta1 = 0.3: **2.3**

4) Write pseudocode of gradient descent in linear regression algorithm:

5)You run gradient descent. After 20 iterations with a learning rate of 0.7, your **cost function increases fastly**, what should you do ?

- Increase learning rate
- **Decrease learning rate**
- Stay the same learning rate 0.7

6) What type of algorithm linear regression ?

- Classification
- **Regression**

8) Before leaving for work, Serap checks the weather report in order to decide whether to carry an umbrella. On any given day, with probability 0.3 the forecast is “rain" and with probability 0.7 the forecast is “no rain". If the forecast is “rain", the probability of actually having rain on that day is 0.8. On the other hand, if the forecast is “no rain", the probability of actually raining is 0.1. One day, Serap missed the forecast and it did not rain. What is the probability that the forecast was “no rain"? (Answer round to 4 numbers after decimal point)
0.913

9) Alice and Bob have an equal probability with 0.5 to send email for friends.
P(Hello | Alice) = 0.4; P(World | Alice) = 0.4; P(Hey | Alice) = 0.2
P(Hello | Bob) = 0.25; P(World | Bob) = 0.25; P(Hey | Bob) = 0.5
Who wrote this email ? - 'Hello World'

- **Alice wrote this email**
- Bob wrote this email
- Both can wrote this email with equal probability

Variant 2

1) Some problems in machine learning can be classified as supervised learning or unsupervised learning. Which of the following of the following tasks you will apply supervised learning algorithms ?

- **Given genetic data about patients in hospital, predict the development of diabetes of this patient.**
- Given data from experiment about testing drug (effectiveness of treatment). Define categories or "types" of patients in terms of their response to the drug.
- **Given dataset of chest X Rays. Detection pneumonia using these images.**
- **Given a dataset of audio clips. Define the genre of this audio clip.**

2) Define the problem type. Use a learning algorithm to predict tomorrow's weather temperature.

- Classification
- **Regression**

3) Given such a dataset of students' scores (1-5) and how many hours they do their work.

Hours (X)	Score (y)
4	4
3	4
4	3
2	1
0	1

Here each row is one training example. Recall linear regression, our hypothesis is **theta0** + **theta1** * **X**, and we use **m** to denote the number of training examples.

For the training set above, what is the value of **m** ?

- 5

Formula of cost function is

$$J(\theta) = \frac{1}{2m} \sum_{i=1}^{m} \left(h_\theta(x^{(i)}) - y^{(i)} \right)^2$$

.

Define J(2,1): **2.4**

What is H(2), if theta0 = 3 and theta1 = 0.5: **4**

4) Write pseudocode of gradient descent in linear regression algorithm:

5)You run gradient descent. After 20 iterations with a learning rate of 0.5, your **cost function decreases slowly**, what should you do ?

- **Increase learning rate**
- Decrease learning rate
- Stay the same learning rate 0.5

6) What type of algorithm logistic regression ?

- **Classification**
- Regression

8) Before leaving for work, Serap checks the weather report in order to decide whether to carry an umbrella. On any given day, with probability 0.4 the forecast is “rain" and with probability 0.6 the forecast is “no rain". If the forecast is “rain", the probability of actually having rain on that day is 0.7. On the other hand, if the forecast is “no rain", the probability of actually raining is 0.2. One day, Serap missed the forecast and it did not rain. What is the probability that the forecast was “rain"? (Answer round to 4 numbers after decimal point)
0.2

9) Alice and Bob have an equal probability with 0.5 to send email for friends.
P(Hello | Alice) = 0.1; P(World | Alice) = 0.7; P(Hey | Alice) = 0.2
P(Hello | Bob) = 0.7; P(World | Bob) = 0.1; P(Hey | Bob) = 0.2
Who wrote this email ? - 'Hello World'

- Alice wrote this email
- Bob wrote this email

- **Both can wrote this email with equal probability**