Course: Machine Learning - Foundations
Week 1 (Practice questions)

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1. (1 point)

   Answer: C
   A model is a mathematical representation of reality

2. (1 point)

   Answer: D
   Target variable is continuous

3. (1 point)

   Answer: D
   Spam detection is an example of machine learning problem

4. (1 point)

   Answer: C
   parameters in regression model are real valued

5. (1 point)

   Answer: A,C
   Target variable is discrete in both cases

6. (1 point)

   Answer: A
   Target variable is continuous

7. (1 point)

   Answer: A,B
   options do not have labelled data available

8. (1 point)

   Answer: D
   output can be either -1 or 1

9. (1 point)

   Answer: B
   output has distinct levels

10. (1 point)

    Answer: C
    decoder function decodes compressed data to original form

11. (2 points)

Answer: C
In problem 1 target variable is discrete while in problem 2 it is continuous

12. (2 points)

Answer: Pair 1: 3(Range 2.95 to 3.05)
Pair 2: 0.667(Range 0.63 to 0.70)
Pair 1: $Loss = \frac{2+6+2+2}{4} = 3$

x_1	x_2	x_3	$f(\mathbf{x})$	$g(f(x^i)) - x^i$	$\|\|g(f(x^i)) - x^i\|\|^2$
10	10	9	9	[-1, -1, 0]	2
13	12	13	14	[1, 2, 1]	6
5	5	4	4	[-1, -1, 0]	2
8	7	7	8	[0, 1, 1]	2

Pair 2: $Loss = \frac{0.667+0.667+0.667+0.667}{4} = 0.667$

x_1	x_2	x_3	$f(\mathbf{x})$	$g(f(x^i)) - x^i$	$\|\|g(f(x^i)) - x^i\|\|^2$
10	10	9	9.67	[-0.33, -0.33, 0.67]	0.667
13	12	13	12.67	[-0.33, 0.67, -0.33]	0.667
5	5	4	4.67	[-0.33, -0.33, 0.67]	0.667
8	7	7	7.33	[-0.67, 0.33, 0.33]	0.667