CSPB 2820 - Truong - Linear Algebra with Computer Science Applications

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Time taken	3 mins 17 secs
Marks	8.00/8.00
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Consider the first section in Chapter 2 Jupyter Notebook (Functions in Python) -

Which of the following are true?

Select one or more:

- [ ] a.
  g(x,a) takes a single vector as input.
- [ ] b.
  f(x) is a polynomial function of the real numbers - f(x) = 0*x + 1*x + x^2
- [ ] c.
  The function gives an error message when the input vectors are of unequal lengths.
- [x] d.
  f(x) takes a vector as input. ✔
- [ ] e.
  g(x,a) takes a variable x, and a constant a from the set of real numbers.
- [x] f.
  g(x,a) takes 2 vectors as input. ✔

Your answer is correct.

Correct

Marks for this submission: 1.00/1.00.

Question **2**

Correct

Mark 1.00 out of 1.00

In 2.1 of the Python Companion PDF, notice the text definition of the function f(x) has subscripts 1, 2, and 4.

However, in the code the function f(x) calls f[0], f[1] and f[3]

This is a typo.

Select one:

- True
- False ✔

Correct

Marks for this submission: 1.00/1.00.

Question **3**

Correct

Mark 1.00 out of 1.00

Experiment with some values of a and x.

What does g() do?

- a. Sums the values of the a vector. x is used as a counter.
- b. It is not a function - it is a short piece of code.
- c. Multiplies the corresponding entries of 2 vectors and adds them together when the vectors are of equal length. ✔
- d. Calculates g(f(x))

Your answer is correct.

Correct

Marks for this submission: 1.00/1.00.

Question **4**

Correct

Mark 1.00 out of 1.00

Look again at g() in the 2.1 Python Notebook.

Run the block again with vectors of the same length.

The run the block with vectors of different lengths.

Which of the following are true?

Select one or more:

- [ ] a.
not enough information to say anything about it
- [ ] b.
g() returns values for vectors of different lengths, so it is the inner product function.
- [x] c.
Since g() returns a value for vectors of different lengths, it cannot be the inner product function. ✔
- [x] d.
When the inputs of g() are vectors of the same length, g() acts like the inner product function. ✔
- [ ] e.
g() is the inner product function.

Your answer is correct.

Correct

Marks for this submission: 1.00/1.00.

Question **5**

Correct

Mark 1.00 out of 1.00

Can you think of some simple way to rewrite or adjust this g() so that it can be used as inner product function?

Post suggestions on Piazza.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 1.00/1.00.

Question **6**

Correct

Mark 1.00 out of 1.00

Refer to the 2nd code block under Section 2.2 Taylor Approximations in the Chapter 2. Jupyter Notebook.

A Taylor polynomial of degree 1 is a line used to approximate values of a polynomial near a certain point.

First, at about which value(s) of x do the line (The Taylor Polynomial), and f(x) have the same values?

Run the block and adjust the domain of the graph to answer the questions.

Select one or more:

- [x] 2 ✔
- [ ] -4
- [ ] 0
- [ ] 4.5
- [x] 5.5 ✔

Your answer is correct.

Correct

Marks for this submission: 1.00/1.00.

Question **7**

Correct

Mark 1.00 out of 1.00

Consider the values found in the question above.

Which of the following are true?

Select one or more:

- [x] a.
  The value of Taylor Polynomial at x = 2.1 is a reasonable approximation for f(2.1). ✔
- [ ] b.
  The value of Taylor Polynomial at x = 5.6 is a reasonable approximation for f(5.6).
- [x] c.
  While the Taylor Polynomial line intersects f(x) at two point, it is only useful for making approximations where the line is tangent to the curve. ✔
- [x] d.
  In the olden days this method could have been used to approximate complicated functions that could not be easily calculated without calculators or computers. ✔
- [ ] e.
  Taylor Polynomials are entirely useless.

Your answer is correct.

Correct

Marks for this submission: 1.00/1.00.

Question **8**

Correct

Mark 1.00 out of 1.00

The house data example from the book, the Jupyter Notebook 2, and the Python Companion is just an example or demonstration of a topic we will explore later in the course - not an in depth analysis of the topic of linear regression.

Select one:

- (•) True ✔
- ( ) False

Correct

Marks for this submission: 1.00/1.00.