CSPB 3702 - Reckwerdt - Cognitive Science

Started on	Sunday, 22 October 2023, 9:12 PM
State	Finished
Completed on	Sunday, 22 October 2023, 9:20 PM
Time taken	7 mins 26 secs
Grade	Not yet graded

Question **1**

Complete

Mark 3.00 out of 3.00

How did Kosslyn help to settle (some of) the debate between pictoralists/visualists and symbolists?

Select one:

- a. He reviewed the case history of individuals with missing brain segments.
- b. He asked participants to perform a mental imagery task and then discuss how that activity related to their vision.
- c. He used MRI to compare the differences in brain activity between a mental imaging task and a picture viewing task.
- d. He never got involved in vision vs mental imagery.

Your answer is correct.

Question **2**

Complete

Mark 3.00 out of 3.00

Broca's area was discovered to be important in speech through which methodology?

Select one:

- a. Using an MRI to measure activity when speaking.
- b. Targeting surgical removal of segments of rat brains and measuring the amount and duration of squeaks.
- c. Studying the speech response patterns of brain injury patients with damage in that area.

Your answer is correct.

Question **3**

Complete

Mark 3.00 out of 3.00

What did Hubel & Weisel's Nobel Prize-winning study discussed in lecture (the one involving cats) discover?

Select one:

- a. Cats can demonstrate a mental rotation task.
- b. Cats have a particular neuron that responds to a bar of light in a particular orientation moving in a particular direction.
- c. Cats use the same visual search patterns as humans to find prey.

Your answer is correct.

Question **4**

Complete

Mark 3.00 out of 3.00

Which of the following examples from earlier in the class is an example of a convolution step?

Select one:

- a. Prospect Theory from our discussions of judgement and decision making
- b. The rotation problem from visual processing
- c. The "sombrero" function in edge detection
- d. The rubik's cube problem in problem solving

Your answer is correct.

Question **5**

Complete

Mark 3.00 out of 3.00

As discussed in lecture (both this week and earlier in the course), one of the early tenets of cognitive science is that:

Select one:

- a. Software : Hardware :: Mind : Computer
- b. Computer : Hardware :: Brain : Conscious
- c. Software : Hardware :: Mind : Brain
- d. Software : Computer :: Brain : Hardware

Your answer is correct.

Question **6**

Complete

Mark 3.00 out of 3.00

A dendrite serves what purpose in a (prototypical) brain cell?

Select one:

- a. Sending signals (action potentials) to other brain cells.
- b. Combining input to determine if it meets the threshold to produce output.
- c. Dendrites do not serve a purpose in brain cell activity.
- d. Detecting inputs from other cells and contributing that information to the cell's decision.

Your answer is correct.

Question **7**

Complete

Mark 3.00 out of 3.00

Why do we need to use multiple rounds of training for neural networks?

Select one:

- a. Because we begin with random weights for all inputs.
- b. Because we might have over-corrected, creating a wrong output for a previously correct input.
- c. Because we need to continue to test new input options.
- d. All of the above.

Your answer is correct.

Question **8**

Complete

Mark 3.00 out of 3.00

What is the purpose of the backpropogation algorithm?

Select one:

- a. To choose which decision function you might use at each of your hidden layer nodes.
- b. To adjust the weights of all connections based on the impact that change would have on the output.
- c. To check if the answer you want could be generated by the inputs you expect.
- d. Backpropogation is not a useful algorithm.

Your answer is correct.

Question **9**

Complete

Mark 3.00 out of 3.00

What is the process of "simulated annealing" affecting in neural net training?

Select one:

- a. x_j - the input
- b. Err - the error between what we wanted and what we got
- c. α - alpha, our tuning parameter
- d. out'(in) - the impact of our potential change on our output

Your answer is correct.

Question **10**

Complete

Mark 3.00 out of 3.00

Which of the following describes the general class of problems for which neural nets are well suited?

Select one:

- a. Search problems
- b. Cat identification problems
- c. pattern recognition problems
- d. spoken number recognition problems

Your answer is correct.

Question **11**

Complete

Mark 15.00 out of 15.00

Consider the convolution example from the video "Deep Learning - Object Recognition." (around 10:00)

Repeat this method with the following matrices as in the video, and **produce the resulting convoluted feature on your own.**

Report the results of the selected elements below **from your convoluted figure (3x3 matrix).**

	1	0	1				
	0	1	0				
	1	0	1				
	1	0	0	1	1		
	0	1	0	1	0		
	0	0	1	0	1		
	0	1	0	1	0		
	1	1	0	0	1		

Convoluted figure (Matrix - should be 3x3) Row 3, Column 2. 1

Convoluted figure (Matrix - should be 3x3) Row 1, Column 1 3

Convoluted figure (Matrix - should be 3x3) Row 2, Column 2. (center) 5

Your answer is correct.

Question **12**

Complete

Marked out of 16.00

Matrix A:

-1	-1	-1
-1	8	-1
-1	-1	-1

Matrix C:

1	1	1	1	1	1
0	0	1	1	1	1
0	0	0	0	1	1
1	0	1	0	0	0
0	1	0	0	0	0
1	0	1	0	0	1

Using the same technique that we saw in the lecture on convolutional neural networks, convolve Matrix A with Matrix C. The result should be a 4x4 matrix of numbers.

Below is the convolution of matrix A on matrix C.

Convolution

-4	4	2	1
-3	-3	-5	4
-3	7	-2	-2
4	-3	-2	-1

Question **13**

Complete

Marked out of 16.00

Consider the following matrices:

Matrix B:			
1	-1	1	
-1	1	-1	
1	-1	1	

Matrix C:

1	1	1	1	1	1
0	0	1	1	1	1
0	0	0	0	1	1
1	0	1	0	0	0
0	1	0	0	0	0
1	0	1	0	0	1

Using the same technique that we saw in the lecture on convolutional neural networks, convolve Matrix B with Matrix C.

The result should be a 4x4 matrix of numbers.

Below is the convolution of matrix A on matrix C.

Convolution

0	1	1	0
3	-1	1	1
-3	2	0	0
5	-3	2	1