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# Unit 2 - Week 1

ourse outline	Assignment 1	
w to access the	The due date for submitting this assignment has passed.	Due on 2018-02-05, 23:59 IST.
Ttal	Assignment submitted on 2018-02-02, 22:56 IST	1011
eek 1	1) What are the commonly used software tools for visual computing?	1 pc
Lecture 1: Introduction to Visual Computing	<ul><li>Pytorch</li><li>Convolutional neural networks</li><li>Machine learning</li></ul>	
Lecture 2: Feature Extraction for Visual	C Computer Vision	
Computing	Yes, the answer is correct. Score: 1	
Lecture 3: Lab: Feature Extraction with Python	Accepted Answers: Pytorch	
Lecture 4: Neural Networks for Visual Computing	<ul><li>2) What is the major feature for employing GPUs in machine vision?</li><li>© Better accuracy</li></ul>	1 p
Lecture 5: Lab: Classification with Perceptron Model	C Less cost C Faster convergence Parallel computing	
Feedback for Week 1	Yes, the answer is correct. Score: 1	
Week 1: Lecture Slides	Accepted Answers: Parallel computing	
Quiz : Assignment 1	3) What is the market for machine vision for 2020?	1 p
Week 1: Assignment Solutions	<ul> <li>○ 6 Billion</li> <li>○ 3.5 Billion</li> <li>○ 6.5 Billion</li> <li>○ 9.5 Billion</li> </ul>	
ek 2	Yes, the answer is correct.	
ek 3	Score: 1	
ek 4	Accepted Answers: 9.5 Billion	
ek 5	4) Which of the following is a statistical texture metric?	1 p
ek 6	Cocal Binary Patterns	
ek 7	<ul><li>Orientation Histogram</li><li>Wavelets</li><li>Fourier Coefficients</li></ul>	
ek 8	No, the answer is incorrect.	
ek 9	Score: 0	
ek 10	Accepted Answers: Orientation Histogram	
ek 11	5) The size of the Co-occurrence matrix depends on	1 p
ek 12	<ul><li>None of these</li><li>Image contrast</li></ul>	
	C Image entropy	
DWNLOAD DEOS	Gray levels in image	
	Yes, the answer is correct. Score: 1	

```
6) Which of the factors govern high frequency attributes of Gabor wavelet?
                                                                                                   1 point
    C Centroid of receptive field
    Spatial frequency
    All of these
    C Standard deviation of Gaussian
  No, the answer is incorrect.
  Score: 0
  Accepted Answers:
  Spatial frequency
 7) What is the output of sigmoid function for an input with dynamic range [0,\infty]?
                                                                                                   1 point
    O [-1, 1]
    C [0, 1]
    C [0.25, 1]
  Yes, the answer is correct.
  Score: 1
  Accepted Answers:
  [0.5, 1]
 8) Assume a neural network with 100 input neurons, 50 hidden neurons and 2 output neurons. How many 1 point
parameters are to be learned?
    C 5100
    C 50

⊙ 5152

    C 10000
  No, the answer is incorrect.
  Score: 0
  Accepted Answers:
  5100
 9) Which of the following function is used for classification?
                                                                                                   1 point
    Mean square error
    Negative log likelihood
    Absolute loss
    C KL Divergence
  No, the answer is incorrect.
  Score: 0
  Accepted Answers:
  Negative log likelihood
 10)What is the local binary pattern of
                                                                                                   1 point
9 3 2
5 4 1
2 7 8
    © 00011011
    C 00110110
    O 10001101
    C 11001101
  Yes, the answer is correct.
  Score: 1
  Accepted Answers:
  00011011
```

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Week 11

Week 12

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1 point

1 point

1 point

1 point

## Unit 3 - Week 2

#### **Assignment 2** Course outline The due date for submitting this assignment has passed. Due on 2018-02-07, 23:59 How to access the portal Assignment submitted on 2018-02-05, 00:35 IST Week 1 1) Which of the following algorithms are said to be learning? Week 2 C Identifying hyper-plane to separate features representing different classes C Identifying objects for computer vision task C Lecture 6 : • Increase of performance with experience Introduction to C Heuristically constructing intelligent feature descriptors Deep Learning with Neural Networks Yes, the answer is correct. I ecture 7 · Score: 1 Introduction to **Accepted Answers:** Deep Learning with Increase of performance with experience Neural Networks 2) Which of the following is dependent on other tasks? C Lecture 8 : Multilayer Salient segments Perceptron and Part detection Deep Neural Networks Scene description C Human detection Clecture 9: Multilaver Yes, the answer is correct. Perceptron and Score: 1 Deep Neural Networks **Accepted Answers:** Scene description Clecture 10: Classification with 3) Multi layer perceptron architectures are expected to Multilayer Perceptron Construct Feature descriptors Not fall into local minima Feedback for Week Reduce loss C All of the above Week 2: Lecture Slides Yes, the answer is correct. Score: 1 Quiz : Assignment 2 **Accepted Answers:** Week 2: Construct Feature descriptors Assignment 4) Deep learning established state-of-the-art performance in the field of Solutions Autonomous driving Week 3 C Natural language processing C Medical imaging Week 4 All of the above Week 5 Yes, the answer is correct. Score: 1 Week 6 **Accepted Answers:** All of the above Week 7 5) In a MLP (multi layer perceptron) with sigmoid function which layers exhibit vanishing gradient property 1 point Week 8 C Intermediate layers O Non-differentiable loss block Week 9 C Layers near loss block C Initial layers Week 10

No, the answer is incorrect.

**Accepted Answers:** 

Initial layers

6) Given an image classification task which of the following approaches is commonly employed	1 point
C Long Short Term Memory	
<ul> <li>HOG + Support vector machines</li> <li>Texture features + Random forests</li> </ul>	
Convolutional neural network with logistic regression	
Yes, the answer is correct. Score: 1	
Accepted Answers: Convolutional neural network with logistic regression	
7) Consider a perceptron with weights as [2, 3, 4] and bias as 9. What is the output provided [1, 2, 3] as input?	1 point
C 2.22 C 180	
© 20 <b>©</b> 29	
Yes, the answer is correct. Score: 1	
Accepted Answers:	
8) Which of the following function is used for classification?	1 point
⊙	
Negative log likelihood	
Mean square error	
· ·	
Absolute loss	
KL Divergence	
Yes, the answer is correct. Score: 1	
Accepted Answers: Negative log likelihood	
9) Assume a neural network with 100 input neurons, 50 hidden neurons and 2 output neurons. How many (	) points
parameters are to be learned?	pomic
O 10000	
○ 50 ○ 5152	
© 5100	
Yes, the answer is correct. Score: 0	
Accepted Answers: 5152	
10)Which of the following is considered for correcting a weight during back propagation?	1 point
<ul> <li>☐ Gradient of error</li> <li>☑ Negative gradient of error w.r.t weight</li> </ul>	
<ul><li>Positive gradient of weight</li><li>Negative gradient of weight</li></ul>	
Yes, the answer is correct. Score: 1	
Accepted Answers:  Negative gradient of error w.r.t weight	

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## Unit 4 - Week 3

#### **Assignment 3** Course outline The due date for submitting this assignment has passed. Due on 2018-02-14, 23:59 How to access the portal Assignment submitted on 2018-02-14, 23:49 IST Week 1 1) Which of the following models can be employed for unsupervised learning 1 point Week 2 Autoencoder Week 3 O Lecture 11: Deep Belief Networks Autoencoder for Representation 0 Learning and MLP Initialization None 0 Lecture 12 : MNIST Both handwritten digits classification using No, the answer is incorrect. autoencoders Score: 0 C Lecture 13: **Accepted Answers:** Fashion MNIST Both classification using autoencoders 2) Which of the following statements are true for a autoencoder (neglect bias): 1 point C Lecture 14: ALL-**IDB** Classification (i) Number of input perceptrons are equal to number of output perceptrons using autoencoders (ii) It needs supervised labels Lecture 15 : Retinal (iii) It is a regression algorithm Vessel Detection using autoencoders (i) and (ii) Week 3: Lecture Slides Quiz : Assignment (ii) and (iii) 3 Week 3: C (i), (ii) and (iii) Assignment Solutions (i) and (iii) Week 4 Yes, the answer is correct. Score: 1 Week 5 **Accepted Answers:** (i) and (iii) Week 6 3) What is the dimension of encoder weight matrix of an autoencoder (hidden units=400) constructed to 1 point Week 7 handle 10 dimensional input samples rows = 400 and columns = 11 Week 8 C rows = 400 and columns = 10 C rows = 11 and columns = 400 Week 9 rows = 10 and columns = 401 Week 10 Yes, the answer is correct. Score: 1 Week 11 **Accepted Answers:** rows = 400 and columns = 11 Week 12 4) What is the dimension of decoder weight matrix of an autoencoder (hidden units=400) constructed to 1 point DOWNLOAD handle 10 dimensional input samples **VIDEOS**

C rows = 11 and columns = 400 rows = 10 and columns = 401 rows = 400 and columns = 11 rows = 400 and columns = 10

Yes, the answer is correct. Score: 1	
Accepted Answers:	
rows = 10 and columns = 401	
5) Which of the following cases is best suited for training SAE and transferring those weights to initialize deep neural network for classification	1 poin
C Ample unlabelled data and limited labelled data	
C Big data and GPU	
<ul><li>Ample labelled data</li><li>Any of the above</li></ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Ample unlabelled data and limited labelled data	
6) Which of the following statement is true for a trained SAE (n=3) with E1, E2 and E3 being autoencoders	1 poin
O None	
© E3 is hierarchically more representative	
<ul><li>E1 is hierarchically more representative</li><li>Number of E3 weights should be greater that E1</li></ul>	
Yes, the answer is correct.	
Score: 1	
Accepted Answers: E3 is hierarchically more representative	
7) What should $E_n(\boldsymbol{n}^{th} \ { m block})$ represent for an ideal SAE trained on face dataset	1 poin
C Edges	
C Eigen face	
<ul><li>Curves</li><li>None of the above</li></ul>	
No, the answer is incorrect.  Score: 0	
Accepted Answers: Eigen face	
8) While exporting DNN as feature extractor for patch classification what should be the last block?	1 poin
C Logistic regression	·
Random forest	
O Support vector machine	
C Any of the above	
No, the answer is incorrect. Score: 0	
Accepted Answers:	
Any of the above	
9) What should $E_1$ ( $1^{st}$ encoder block) represent for an ideal SAE (stacked autoencoder) trained on MRI dataset	1 poin
○ Corners	
⊙ Organs	
C Edges	
C Pathology  No, the answer is incorrect.	
Score: 0	
Accepted Answers:  Edges	
10)Which loss function is used while training autoencoder	1 poin
C Logistic regression	
C Any regression loss	
<ul><li>Any regression loss</li><li>Any classification loss</li></ul>	
Yes, the answer is correct. Score: 1	
Accepted Answers:	
Any regression loss	

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## Unit 5 - Week 4

### Course outline

How to access the portal

Week 1

Week 2

Week 3

Week 4

C Lecture 16: Stacked Autoencoders

Lecture 17: MNIST and Fashion MNIST with Stacked Autoencoders

C Lecture 18: Denoising and Sparse Autoencoders

Lecture 19: Sparse Autoencoders for MNIST classification

Clecture 20: Denoising Autoencoders for MNIST classification

Feedback for Week

Week 4: Lecture Slides

Quiz : Assignment

Week 4: Assianment Solutions

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

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## **Assignment 4**

The due date for submitting this assignment has passed.

Due on 2018-02-21, 23:59

Assignment submitted on 2018-02-21, 17:55 IST

1) Given that  $E_n$  and  $D_n$  are encoder and decoder blocks of  $n^{th}$  autoencoder in SAE (Stacked autoencoder). **1 point** What is the sequence of blocks during end-to-end training of SAE (with n=2)

 $\mathit{Input} \to E_1 \to D_1 \to E_2 \to D_2 \to \mathit{Input}$  $\mathit{Input} \to E_1 \to E_2 \to D_1 \to D_2 \to \mathit{Input}$ 

 $\mathit{Input} \to E_1 \to E_2 \to D_2 \to D_1 \to \mathit{Input}$ 

C Any of the above

Yes, the answer is correct.

Score: 1

**Accepted Answers:** 

$$\mathit{Input} \to E_1 \to E_2 \to D_2 \to D_1 \to \mathit{Input}$$

2) Given a trained SAE (n = 2), how should the blocks be arranged for weight refinement (classification task)

 $Input \rightarrow E_1 \rightarrow E_2 \rightarrow D_1 \rightarrow D_2 \rightarrow \text{Logistic regression}$ 

 $Input \rightarrow E_1 \rightarrow E_2 \rightarrow Logistic regression$ 

 $Input \rightarrow E_1 \rightarrow E_2 \rightarrow D_1 \rightarrow D_2 \rightarrow Logistic regression$ C Any of the above

Yes, the answer is correct.

Score: 1

**Accepted Answers:** 

 $Input \rightarrow E_1 \rightarrow E_2 \rightarrow Logistic regression$ 

3) Given input x and linear autoencoder (no bias) with random weights ( W for encoder and W for decoder), 1 point what mathematical form is minimized to achieve optimal weights

 $|x - (W' \cdot W \cdot x)|$  $|x - (W' \cdot N_{fl}(W \cdot x))|$ 

 $|x - N_{ff}(W' \cdot N_{ff}(W \cdot x))|$ None of the above

No, the answer is incorrect. Score: 0

**Accepted Answers:** 

$$|x - (W' \cdot W \cdot x)|$$

4) Given an linear autoencoder which encodes input x to z. For learning hierarchically high-level 1 point representation what should be the learning arrangement of second linear autoencoder (with weights  $W_2$  and  $W_2$ )

$$\begin{split} \mathbf{C} \\ &|x-(W_2^{'}\cdot W_2\cdot x)| \\ \mathbf{C} \\ &|z-(W_2^{'}\cdot W_2\cdot z)| \\ \mathbf{C} \\ &|z-(W_2\cdot W_1\cdot x)| \\ \mathbf{\mathfrak{G}} \end{aligned}$$
 None of the above

### No, the answer is incorrect.

Score: 0

### **Accepted Answers:**

$$|z-(W_2'\cdot W_2\cdot z)|$$

5) In a de-noising autoencoder, noise is added to input for

1 point

- Avoiding overfitting
- © Robust feature extraction
- C Data augmentation
- All of the above

### No, the answer is incorrect.

Score: 0

### **Accepted Answers:**

All of the above

6) In a linear autoencoder (without regularizer), if hidden layer perceptrons are equal to input layer perceptron then encoder and decoder weights are indulged to learn

1 point

- C Optimal representations
- Identity matrix
- C Sparse representations
- None of the above

### Yes, the answer is correct.

Score: 1

### **Accepted Answers:**

Identity matrix

7) The role of regularizer in cost function is to

1 point

- Avoid overfitting
- C Induce sparsity
- C Simpler hypothesis
- All of the above

Yes, the answer is correct.

Score: 1

### **Accepted Answers:**

All of the above

8) Given feature vector X and corresponding label (y), logistic regression relates X and y in the form of (B is **1 point** parameters to be learned)

$$\log \frac{y}{(1-y)} = BX$$

$$O$$

$$y = BX$$

$$O$$

$$\frac{1}{1+e^{BX}}$$

C None of the above

### Yes, the answer is correct.

Score: 1

### **Accepted Answers:**

$$\log(\frac{y}{1-y}) = BX$$

9) Given feature vector X (with dimension j), corresponding label y (binary class) and weights  $(b_1, b_2, ..., b_k)$  **1 point** of logistic regressor, z be output (expected) of logistic regressor. What is the loss function (L) and gradient computed to correct the  $b_k$  based on chain rule

ylog(z) and  $(y-z)x_k$ y - log(z) and  $\overline{\partial b_k}$ ylog(z) + (1 - y)(1 - log(z)) and  $\frac{\partial \overline{\partial z}}{\partial b_k}$ ylog(z) + (1 - y)(1 - log(z)) and  $(y + z)x_k$ 

Yes, the answer is correct.

Score: 1

### **Accepted Answers:**

ylog(z) + 
$$(1 - y)(1 - \log(z))$$
 and  $\frac{\partial L}{\partial z} \frac{\partial z}{\partial b_k}$ 

10)What are the advantages of initializing MLP with pretrained autoencoder weights

- (i) Faster Convergence (ii) Avoid overfitting
- (iii) Simpler hypothesis
- - (i) and (ii)
  - C (ii) and (iii)
  - (i) and (iii)
  - C All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

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(i) and (ii)

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1 point

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# Unit 6 - Week 5

ourse outline	Accianment 5	
ourse outline	Assignment 5	
ow to access the ortal	The due date for submitting this assignment has passed.  Due on 2018-02-28, 23:  IST.	:59
/eek 1	Assignment submitted on 2018-02-28, 21:03 IST	4
eek 2	Which of the following functions are used for classification     (i) Binary cross entropy  (ii) Soft marring less.	1 point
eek 3	(ii) Soft margin loss (iii) Absolute loss (iii) Moon aguered error	
eek 4	(iv) Mean squared error  (i) and (ii)	
eek 5	C (ii) and (iii) C (iii) and (iv)	
Lecture 21: Cost	None of the above  Yes, the answer is correct.	
Lecture 22: Classification cost functions	Score: 1  Accepted Answers: (i) and (ii)	
Lecture 23: Optimization Techniques and Learning Rules	2) Which of the following functions are used for regression  (i) Binary cross entropy	1 point
Lecture 24: Gradient Descent Learning Rule	(ii) Soft margin loss (iii) Absolute loss (iv) Mean squared error	
Lecture 25: SGD and ADAM Learning Rules	<ul> <li>C (i) and (ii)</li> <li>C (ii) and (iii)</li> <li>⊙ (iii) and (iv)</li> </ul>	
Week 5: Lecture Slides	None of the above	
Quiz : Assignment	Yes, the answer is correct. Score: 1	
5	Accepted Answers:	
Week 5: Assignment	(iii) and (iv)	
Solutions	3) Which of the following loss function is employed for multi-class classification	1 point
eek 6	<ul> <li>Binary cross entropy</li> <li>Negative log likelihood</li> </ul>	
eek 7	C L1 Loss C MSE	
eek 8	No, the answer is incorrect.	
eek 9	Score: 0	
eek 10	Accepted Answers: Negative log likelihood	
ek 11	4) Given a neural network with one output neuron (with sigmoid activation) for two class classification,	1 point
ek 12	which of the following loss function is used  • Binary cross entropy	
OWNLOAD DEOS	O Negative log likelihood O L1 Loss O MSE	

5) Given a neural network with two output neurons (with log softmax activation) for two class classification, 1 point

Yes, the answer is correct.

Accepted Answers: Binary cross entropy

Score: 1

which of the following loss function is used	
© Binary cross entropy	
Negative log likelihood     L1 Loss	
O MSE	
Yes, the answer is correct. Score: 1	
Accepted Answers:	
Negative log likelihood	
To employ margin loss for classification which transfer function should be used to transform the esponses of output neurons	1 point
○ Sigmoid	
C Leaky ReLU	
Tanh	
Yes, the answer is correct. Score: 1	
Accepted Answers:	
Tanh	
7) Which of the following loss is asymmetric in nature	1 point
C L1 Loss	
<ul><li>C MSE Loss</li><li>⊙ Kullback-Leibler Divergence</li></ul>	
None of the above	
Yes, the answer is correct. Score: 1	
Accepted Answers:	
Kullback-Leibler Divergence	
8) Which of the following loss is non differential	1 point
	i point
© L1 Loss	
C MSE Loss	
<ul> <li>Kullback-Leibler Divergence</li> <li>None of the above</li> </ul>	
Yes, the answer is correct. Score: 1	
Accepted Answers:	
L1 Loss	
Which of the following losses are combined while training sparse autoencoder	1 point
i) MSE	r point
i) KL divergence	
iii) Absolute loss	
C (ii) and (iii)	
C (iii) and (i)	
C None of the above	
Yes, the answer is correct.	
Score: 1	
Accepted Answers: (i) and (ii)	
10)Which of the following regression losses is more prone to outliers	1 poin
C L1 Loss	
C Minimum (MSEloss, L1 loss)	
C Cross entropy	
Yes, the answer is correct.	
Score: 1	
Accepted Answers:	
MSE Loss	

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## Unit 7 - Week 6

#### **Assignment 6** Course outline The due date for submitting this assignment has passed. Due on 2018-03-07, 23:59 How to access the portal Assignment submitted on 2018-03-07, 23:29 IST Week 1 1) What should be the response dimension if an image of dimension $3 \times 25 \times 25$ is convoloved with a filter point. of dimension $3 \times 5 \times 5$ ? Week 2 Week 3 $1\times21\times21$ 0 Week 4 $3\times25\times25$ 0 Week 5 $1\times25\times25$ 0 Week 6 $25\times25\times1$ Lecture 26: Yes, the answer is correct. Convolutional Score: 1 Neural Network **Accepted Answers: Building Blocks** $1 \times 21 \times 21$ Lecture 27: Simple CNN Model: LeNet 2) What should be the response dimension if an image of dimension 3 imes25 imes25 is padded with width of **1 point** 2 and convoloved with a filter of dimension $3 \times 5 \times 5$ ? Lecture 28: LeNet Definition Cecture 29: $1\times21\times21$ Training a LeNet for O MNIST $3\times25\times25$ Classification 0 Lecture 30: $1\times25\times25$ Modifying a LeNet 0 for CIFAR $25 \times 25 \times 1$ Feedback for Week Yes, the answer is correct. Week 6: Lecture **Accepted Answers:** Slides 1 imes 25 imes 25Quiz : Assignment 3) What should be the response dimension if an image of dimension $3 \times 25 \times 25$ is convoloved with a filter *1 point* 6 of dimension $3 \times 5 \times 5$ and considered stride as 2 ? Week 6: Assignment 0 Solutions $1\times11\times11$ 0 Week 7 $3 \times 12.5 \times 12.5$ 0 Week 8 $1 \times 12.5 \times 12.5$ 0 Week 9 $1 \times 12 \times 12$ Week 10 No, the answer is incorrect. Score: 0 Week 11 **Accepted Answers:** $1 \times 11 \times 11$ Week 12 4) Including maxpooling equips the model to be invariant to with in the limits of 1 point **DOWNLOAD**

maxpooling kernel

Translation

0 Scale

**VIDEOS** 

© Rotation	
None of the above	
No, the answer is incorrect. Score: 0	
Accepted Answers: Translation	
5) Which of the following filter is functionally equivalent to maxpooling operation	1 point
<ul> <li>Erosion</li> <li>Dilation</li> <li>Rank Filter</li> <li>None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Dilation	
6) If the encoder part of an autoencoder with 784 input neurons and 100 hidden neurons ${\bf c}$ is a $n$ convolutional filters each with $a,b$ and $c$ as input channels, filter height and filter width $a,b$ and $c$	
int: Autoencoder is trained on gray scale image patches of size $~28  imes 28$	
C 1, 100, 28 and 28 C 100, 1, 28 and 28 C 28, 100, 1 and 28	
None of the above	
No, the answer is incorrect. Score: 0	
Accepted Answers: 100, 1, 28 and 28	
7) Which operation needs max pooling indices or switch variables?	1 point
<ul> <li>Pooling</li> <li>Unpooling</li> <li>Activation</li> <li>Deconvolution</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Unpooling	
8) Which operation needs learnable weights?	1 point
<ul> <li>Pooling</li> <li>Unpooling</li> <li>Activation</li> <li>Deconvolution</li> </ul>	
Yes, the answer is correct.	
Score: 1	
Accepted Answers: Deconvolution	
What of the following activation function has no gradient for negative responses	1 point
<ul><li>C Sigmoid</li><li>C Tanh</li><li>☑ ReLU</li></ul>	
C Absolute	
Yes, the answer is correct. Score: 1	
Accepted Answers: ReLU	
	1 point
10)LeNet is designed for classification of	

None of the above

Yes, the answer is correct.

**Accepted Answers:** 

Numbers or digits

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# Unit 8 - Week 7

rse outline	Assignment 7	
to access the	The due date for submitting this assignment has passed.  Due on 2018-03-14, 23 IST.	:59
l	Assignment submitted on 2018-03-14, 16:52 IST	
<b>1</b>	1) What advantage does convolutional autoencoder offer incomparision to vanilla autoencoder	1 point
2	© Scalable to large images	
3	<ul> <li>Feature extraction</li> <li>Unsupervised</li> <li>None of the above</li> </ul>	
	No, the answer is incorrect.	
	Score: 0	
	Accepted Answers: Scalable to large images	
	2) In convolutional autoencoder pooling layer is employed to	1 point
re 31 : olutional ncoder and CNN	<ul> <li>Distribute gradients effectively</li> <li>Increase receptive field with same kernel size in subsequent layers</li> <li>Employ unpooling layer</li> <li>None of the above</li> </ul>	
rure 32 : volutional pencoder for resentation ming	Yes, the answer is correct. Score: 1 Accepted Answers: Increase receptive field with same kernel size in subsequent layers	
ure 33 : Net	3) In convolutional autoencoder the middle layers are fully connected because	1 point
34 : et	<ul> <li>This effectively extracts global features</li> <li>Convolutional AE is build upon vanilla AE</li> </ul>	
35 :	<ul><li>Increase speed of operations</li><li>None of the above</li></ul>	
AlexNet Net for ional	Yes, the answer is correct. Score: 1	
exity ack for Week	Accepted Answers: This effectively extracts global features	
': Lecture	4) Which layer should be used in decoder part of Convolutional autoencoder if convolution layer with striss used in encoder part	de <i>1 point</i>
Assignment	<ul><li>Unpooling</li><li>Deconvolution</li></ul>	
	<ul><li>Bilinear Interpolation</li><li>None of the above</li></ul>	
	Yes, the answer is correct. Score: 1	
	Accepted Answers:	
	Deconvolution	
	5) What is the architectural difference between VGG and Alexnet	1 point
2	©	
AD	VGG has single feature extraction stream and Alexnet has two	
	Deconvolution	

Bilinear interpolation

○ None of the above	
Yes, the answer is correct. Score: 1	
Accepted Answers: VGG has single feature extraction stream and Alexnet has two	
6) Which of the architecture has most number of layers and parameters	1 poin
<ul> <li>VGG Net</li> <li>Alex Net</li> <li>LeNet</li> <li>All have same number of parameters</li> </ul>	
Yes, the answer is correct. Score: 1	
Accepted Answers: VGG Net	
7) Local response normalization is employed to	1 poin
<ul> <li>Increase the local maxima response and subdue the neighboring responses</li> <li>Augment activation performance</li> <li>Sparsify gradients</li> <li>None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Increase the local maxima response and subdue the neighboring responses	
8) If CNN filters (no bias) of size $3\times3$ are employed for transforming an image with 3 channels into 64 responses. How many weights need to be learned	1 poin
<ul><li>○ 1378</li><li>○ 1728</li><li>○ 1738</li><li>○ 2000</li></ul>	
Yes, the answer is correct. Score: 1	
Accepted Answers: 1728	
9) If max pooling kernels of size $3\times 3$ are employed for transforming an image with 3 channels into 3 responses. How many weights need to be learned	1 poin
<ul><li>○ 27</li><li>○ 18</li><li>○ 9</li><li>○ 0</li></ul>	
Yes, the answer is correct. Score: 1	
Accepted Answers:	
10)Local response normalization is performed	1 poin
<ul> <li>Mean of the channels</li> <li>Across channels</li> <li>Individual channel</li> <li>None</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Individual channel	

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# Unit 9 - Week 8

rse outline	Assignment 8		
to access the		ue on 2018-03-21, 23:59 ST.	
<u> </u>	Assignment submitted on 2018-03-21, 23:52 IST	,,,	
1	1) In inception block the input information is processed through how many pa	rallel channels? 1	point
2	0.2		
3	O 3 O 4		
4	None of the above		
5	Yes, the answer is correct. Score: 1		
6	Accepted Answers:		
7	2) In inception block the processed input information is combined using whic	h operation?	point
8	C Sum		
	Multiplication     Concatenation		
ture 36: ogLeNet - Going	None of the above		
deep with volutions	Yes, the answer is correct.		
ture 37:	Score: 1 Accepted Answers:		
gLeNet	Concatenation		
ure 38: ResNet sidual nections within / Deep vorks and seNet - sely connected /orks	3) In inception block, what kernal sizes are employed for convolution?	1,	point
ure 39: ResNet	$oldsymbol{\circ} 3 imes 3$		
ure 40: seNet	C All of the above		
dback for Week	No, the answer is incorrect. Score: 0		
back for week	Accepted Answers:		
k 8: Lecture	All of the above		
: Assignment	4) In inception block, what is the contribution of Maxpooling?	1	point
. <i></i>	C To extract features at multiple scales		
	<ul><li>To reduce compute complexity</li><li>To dilate the reponse values</li></ul>		
0	None of the above		
1	No, the answer is incorrect. Score: 0		
2	Accepted Answers: To dilate the reponse values		
II OAD	The idea for residual layer has originated from training layers ef	fectively. 1	point
LOAD S	<ul> <li>○ Initial</li> <li>○ Final</li> <li>○ Both</li> <li>○ None of the above</li> </ul>	ioutory.	

Accepted Answers: Initial	
6) The mathematical equivalence of skip connection in residual block is	1 poi
C Identity matrix Summation Convolution None of the above	
No, the answer is incorrect. Score: 0	
Accepted Answers: Identity matrix	
7) In which case does the loss saturates with less epochs for deeper networks	1 poi
<ul> <li>Network with residual block</li> <li>Network without residual block</li> <li>It is subjective</li> <li>None of the above</li> </ul>	
Yes, the answer is correct. Score: 1	
Accepted Answers: Network without residual block	
8) Which network needs less amount of memory for equal performance	1 poi
C Densenet Residual net VGG net All are same	
No, the answer is incorrect. Score: 0	
Accepted Answers: Densenet	
9) In densenet the information of current is passed on to	1 poi
<ul> <li>C Subsequent layer</li> <li>C Subsequent layers</li> <li>€ User defined</li> <li>C None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Subsequent layers	
10)n densenet such passed on information is	1 poi
C Summed C Concatenated Multiplied None of the above	
Yes, the answer is correct. Score: 1	
Accepted Answers:	

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# Unit 10 - Week 9

ourse outline	Assignment 9	
w to access the	The due date for submitting this assignment has passed.  Due on 2018-03-28, 23 IST.	3:59
ek 1	Assignment submitted on 2018-03-28, 23:56 IST	
k 2	1) What is the space complexity of a fully connected layer (double precision floating with bias) with 100 input neurons and 10 output neurons?	1 poin
3	<ul><li>○ ~8 KB</li><li>○ ~64 KB</li></ul>	
4	<ul><li>○ ~32 KB</li><li>○ None of the above</li></ul>	
5	No, the answer is incorrect. Score: 0	
3	Accepted Answers:	
	~8 KB	
	2) What is the operational complexity of a fully connected layer (double precision floating with bias) with 100 input neurons and 10 output neurons?	1 point
9	<ul><li>○ ~189 Kb</li><li>○ ~17 KB</li></ul>	
re 41 : Space omputational lexity in DNN	<ul><li></li></ul>	
ure 42 : essing the ee and poutational plexity of very o CNNs	No, the answer is incorrect.  Score: 0  Accepted Answers: ~17 KB  3) What is the space complexity of a CNN block (double precision floating with bias) with 10 kernels each	ch <i>1 point</i>
ture 43 : nain Adaptation Transfer rning in Deep ıral Networks	with channels, height and width being 3, 5 and 5 respectively?  • ~47 KB  • ~46.8 Kb  • ~6 KB  • None of the above	
cure 44 : nsfer Learning a gLeNet	No, the answer is incorrect. Score: 0	
ire 45 : sfer Learning a let	Accepted Answers: ~6 KB	
edback for Week	4) What is the operational complexity of a CNN block (double precision floating with bias) with 10 kerne each with channels, height and width being 3, 5 and 5 respectively?	ls 1 point
s 9: Lecture	<ul><li></li></ul>	
: Assignment	<ul><li>~ 46.8 Mb</li><li>None of the above</li></ul>	
	No, the answer is incorrect. Score: 0	
	Accepted Answers:	
	None of the above  5) Data batch size is determined by?	1 point
OAD	O Model Size O RAM Size O Hard Drive Size O Both Model and RAM Size	,

Yes, the answer is correct.

Const. 4	
Score: 1 Accepted Answers:	
Both Model and RAM Size	
6) Which of the following are placed on RAM during training?	1 point
<ul> <li>Model parameters</li> <li>Model gradients</li> <li>Partial data</li> <li>All of the above</li> </ul>	
Yes, the answer is correct. Score: 1	
Accepted Answers: All of the above	
7) Which transform is used to accelerate the compute?	1 point
<ul><li>Fourier</li><li>Hilbert</li><li>PCA</li><li>All of the above</li></ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Fourier	
8) What technique is employed to introduce domain adaptation in stacked autoencoder?	1 point
<ul> <li>Systematic dropout</li> <li>Conditional dictionary learning</li> <li>Feature sampling</li> <li>All of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Systematic dropout	
9) What conditions are required for employing domain adaptation	1 point
<ul> <li>Existence of common domain</li> <li>Ample amount of labelled data in source domain</li> <li>Ample amount of labelled data in target domain</li> <li>All of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Existence of common domain	
10)Domain adaptation has application towards	1 point
<ul> <li>Semantic segmentation</li> <li>Object localization</li> <li>Image classification</li> <li>All of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: All of the above	

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1 point

# **Unit 11 - Week 10**

se outline	Assignment 10	
o access the	The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.	Due on 2018-04-04, 23:59 IST.
1	1) What is the input to region proposal network (rpn)?	1 poin
2	<ul><li>RGB images</li><li>Object Responses</li></ul>	
	<ul><li>Both of the above</li><li>None of the above</li></ul>	
	No, the answer is incorrect. Score: 0	
	Accepted Answers: RGB images	
	2) What is the output of rpn ?	1 point
	Probability of the object class	
	<ul><li>Bounding box parameters of the object</li><li>Both of the above</li></ul>	
	None of the above	
	No, the answer is incorrect. Score: 0	
for Week	Accepted Answers: Both of the above	
poling	<ul><li>3) Which losses govern the rpn?</li><li>Classification loss</li><li>Regression loss</li></ul>	1 point
Region works aster	© Both of the above © None of the above  No, the answer is incorrect.	
GAP +	Score: 0	
OAF 1	Accepted Answers: Both of the above	
n with	4) What kind of classifier is employed in rpn?	1 point
.tn	One class	
et	<ul><li>Two class</li><li>Multi class</li><li>No classifier is employed</li></ul>	
ignment	No, the answer is incorrect. Score: 0	
Lecture	Accepted Answers:  Multi class	
	5) Multiple anchor boxes are generated by changing	1 point
	Aspect ratio	•
	<ul><li>Scale</li><li>Centre</li></ul>	
AD.	C Both aspect ratio and scale	
	No, the answer is incorrect. Score: 0	

6) Which of the following results in multi scale feature extraction

<ul> <li>Multiple filter sizes</li> <li>Multiple versions of rescaled input image</li> <li>Both of the above</li> <li>None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Both of the above	
7) rpn fails in case of	1 poi
<ul> <li>O overlapping objects from different class</li> <li>O overlapping objects from same class</li> <li>O overlapping objects</li> <li>O None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: None of the above	
8) Can an object classifier trained on image patches can propose regions on a canvas image	1 poi
C Yes C No C yes as long as input statistics stay the same C None	
No, the answer is incorrect. Score: 0	
Accepted Answers: yes as long as input statistics stay the same	
9) How many outputs are predicted for a rpn with k anchor boxes	1 poi
<ul><li>○ 2k</li><li>○ 4k</li><li>○ 6k</li><li>○ None</li></ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: 6k	
10)What is the dimension of the vector based on which the above outputs are generated	1 poi
<ul> <li>C 256</li> <li>C 128</li> <li>C Subjective to anchor boxes number</li> <li>C None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: 256	

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## **Unit 12 - Week 11**

## Course outline How to access the portal Week 1 Week 2 Week 3 Week 4 Week 5 Week 6 Week 7 Week 8 Week 9 Week 10 Week 11 Clecture 51: Autoencoders and Latent Spaces Clecture 52 : Principle of Generative Modeling C Lecture 53: Adversarial Autoencoders Clecture 54: Adversarial Autoencoder for Synthetic Sample Generation Lecture 55 : Adversarial Autoencoder for Classification Feedback for Week 11 Quiz : Assignment 11 Week 11: Lecture Slides Week 12 **DOWNLOAD** VIDEOS

## **Assignment 11**

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. Due on 2018-04-11, 23:59

1) What is the role of decoder in adversarial autoencoder?

1 point

- C Generate the images for given latent space information
- C For reducing MSE loss
- C For constructing better latent space
- None of the above

#### No, the answer is incorrect.

Score: 0

### **Accepted Answers:**

Generate the images for given latent space information

1 point

- 2) What could be a solution for generative model training
  - C By appending an auxiliary branch to distinguish between fake and real images
  - C Be reducing number of parameters in the model
  - C Data augmentation through various morphological transformations
  - None of the above

#### No, the answer is incorrect.

Score: 0

### **Accepted Answers:**

By appending an auxiliary branch to distinguish between fake and real images

3) What is the property of a well trained generative model

1 point

- C It can clearly distinguish between fake and real images
- C Given a set of images it can generated a good latent space
- C Given a a random noise the model is capable of generating realistic images
- None of the above

### No, the answer is incorrect.

Score: 0

### **Accepted Answers:**

Given a a random noise the model is capable of generating realistic images

4) Which of the following is true for adversarial autoencoder

1 point

- C The information tapped out from decoder input is used to classify real or fake samples
- C The information sampled from Gaussian distribution is used to classify real or fake samples
- C Both a and b
- None of the above

### No, the answer is incorrect.

Score: 0

### **Accepted Answers:**

Both a and b

5) Which of the following is true for adversarial autoencoder (AAE)

1 point

- C It is supervised framework as a classifier is used for distinguishing positive and negative samples
- It is unsupervised framework
- C The sampling space should be Gaussian
- None of the above

### No, the answer is incorrect.

Score: 0

### **Accepted Answers:**

It is unsupervised framework

6) What is the distinction between AAE and AAE with regularization

1 point

```
C Inclusion of class label during classification of positive or negative samples
  C Inclusion of class label during reconstruction of real sample
  Removal of classification
  All of the above
 No, the answer is incorrect.
 Score: 0
 Accepted Answers:
 Inclusion of class label during classification of positive or negative samples
7) What is true for Supervised AAE
                                                                                       1 point
  C Inclusion of class label during classification of positive or negative samples
  C Inclusion of class label during reconstruction of real sample
  C Removal of classification
  All of the above
 No, the answer is incorrect.
 Score: 0
 Accepted Answers:
 Inclusion of class label during reconstruction of real sample
8) In the code snippet given what is the encoder?
                                                                                       1 point
class Q_net(nn.Module):
     def
          __init__(self,X_dim,N,z_dim):
          super(Q_net, self).__init__()
          self.lin3gauss = nn.Linear(X_dim, z_dim)
     def forward(self, x):
         return xgauss
class P_net(nn.Module):
    def __init__(self,X_dim,N,z_dim):
          super(P_net, self).__init__()
          self.lin1 = nn.Linear(z_dim,X_dim)
     def forward(self, x):
         x = F.dropout(self.lin1(x), p=0.25, training=self.training)
          return F.sigmoid(x)
class D_net_gauss(nn.Module):
     def __init__(self,N,z_dim):
          super(D_net_gauss, self).__init__()
          self.lin1 = nn.Linear(z_dim, N)
         self.lin3 = nn.Linear(N, 1)
     def forward(self, x):
         x = F.dropout(self.lin1(x), p=0.2, training=self.training)
         x = F.relu(x)
          return F.sigmoid(self.lin3(x))
  C Q_net
  C P_net
  C D_net_gauss
  None of the above
 No, the answer is incorrect.
 Score: 0
 Accepted Answers:
 Q_net
9) In the code snippet given what is the decoder?
                                                                                       1 point
```

```
class Q_net(nn.Module):
        __init__(self,X_dim,N,z_dim):
        super(Q_net, self).__init__()
        self.lin3gauss = nn.Linear(X_dim, z_dim)
    def forward(self, x):
        return xgauss
class P_net(nn.Module):
    def __init__(self,X_dim,N,z_dim):
        super(P_net, self).__init__()
        self.lin1 = nn.Linear(z_dim,X_dim)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.25, training=self.training)
        return F.sigmoid(x)
class D_net_gauss(nn.Module):
    def __init__(self,N,z_dim):
        super(D_net_gauss, self).__init__()
        self.lin1 = nn.Linear(z_dim, N)
        self.lin3 = nn.Linear(N, 1)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.2, training=self.training)
        x = F.relu(x)
        return F.sigmoid(self.lin3(x))
  C Q_net
  C P_net
  C D_net_gauss
  None of the above
No, the answer is incorrect.
Score: 0
Accepted Answers:
P_net
10) in the code snippet given what is the classifier?
                                                                          1 point
class Q_net(nn.Module):
    def
        __init__(self,X_dim,N,z_dim):
        super(Q_net, self).__init__()
        self.lin3gauss = nn.Linear(X_dim, z_dim)
    def forward(self, x):
        return xgauss
class P_net(nn.Module):
    def __init__(self,X_dim,N,z_dim):
        super(P_net, self).__init__()
        self.lin1 = nn.Linear(z_dim,X_dim)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.25, training=self.training)
        return F.sigmoid(x)
class D_net_gauss(nn.Module):
    def __init__(self,N,z_dim):
        super(D net gauss, self). init ()
        self.lin1 = nn.Linear(z dim, N)
        self.lin3 = nn.Linear(N, 1)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.2, training=self.training)
        x = F.relu(x)
        return F.sigmoid(self.lin3(x))
  C Q_net
  C P_net
  C D_net_gauss
  None of the above
No, the answer is incorrect.
 Score: 0
Accepted Answers:
D net gauss
```

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1 point

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## **Unit 13 - Week 12**

#### **Assignment 12** Course outline Due on 2018-04-18, 23:59 The due date for submitting this assignment has passed. How to access the As per our records you have not submitted this assignment. IST. portal 1) Which of the following topology is true for RNN? Week 1 Week 2 Many to one Week 3 Many to many Week 4 One to many Week 5 Any of the above Week 6 No, the answer is incorrect. Score: 0 Week 7 **Accepted Answers:** Any of the above Week 8 2) Which of the following parameters are needed for RNN in addition to input transformation weights Week 9 $(W_{h,x,t})$ 0 Week 10 $W_{h,h,t}$ Week 11 $h_{t-1}$ Week 12 Clecture 56: Both a and b Understanding 0 Video Analysis None of the above Lecture 57 : No, the answer is incorrect. Recurrent Neural Score: 0 Networks and Long Short-Term **Accepted Answers:** Memory Both a and b CLecture 58 : Spatio-3) Which of the following gates are used in LSTM? Temporal Deep Learning for Video C Input Analysis C Forget Lecture 59 : Activity Output recognition using All of the above 3D-CNN No, the answer is incorrect. Lecture 60 : Activity Score: 0 recognition using **CNN-LSTM Accepted Answers:** All of the above Feedback for Week 4) Given a sequence of T color images of size 224 x 224, how are they organized for tensor processing? Quiz : Assignment C 3 x T x 224 x 224 12 T x 3 x 224 x 224 Week 12: Lecture C 3 x T x M x M Slides None of the above **DOWNLOAD** No. the answer is incorrect. **VIDEOS**

Score: 0

Accepted Answers: 3 x T x 224 x 224

and single stride. What is the convolution output

5) Given a sequence of 100 color images of size 224 x 224 and kernel of size 3, no padding, 18 channels 1 point

C 18 x 100 x 222 x 222	
C 18 x 98 x 222 x 222	
C 18 x 98 x 224 x 224	
C None of the above	
No, the answer is incorrect. Score: 0	
Accepted Answers: 18 x 98 x 222 x 222	
6) For temporal learning which architecture is most preferable	1 point
<ul> <li>Autoencoder</li> <li>LSTM</li> <li>CNN</li> <li>None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: LSTM	
7) Which of the following hurdles of RNN were overcomed by LSTM	1 point
<ul> <li>C Learning long term dependencies</li> <li>C Exponential decay of learning rate along time</li> <li>C Both a and b</li> <li>C None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Both a and b	
8) Which of the following commands create a LSTM with input dimension as 3 and output dimension as 3 hrough nn module	3 1 point
<ul> <li>nn.LSTM(3, 3)</li> <li>nn.GRU(3, 3).LSTM</li> <li>nn.RNN(3, 3).LSTM</li> <li>None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: nn.LSTM(3, 3)	
9) How many variables are generated upon feed forwarding LSTM for 5 step	1 point
<ul> <li>O output variables</li> <li>O output and hidden variables</li> <li>O output, hidden and input storage variable</li> <li>O None</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: output, hidden and input storage variable	
10)How many variables are fed for lstm	1 point
<ul> <li>C Input</li> <li>C Input and previous hidden state</li> <li>C Input, previous hidden and previous output</li> <li>C None of the above</li> </ul>	
No, the answer is incorrect. Score: 0	
Accepted Answers: Input and previous hidden state	

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