**Quiz on Jupyter Notebooks and Python**

1. In a markdown cell, how would the following be displayed  
   \*\*\*formatted\*\*\*  
   Select one:
   1. **formatted**
   2. formatted
   3. ***formatted***
   4. *formatted*

**Answer: c**

1. With replacement for “Header” would be needed in the following code block within a markdown cell in order to achieve syntax highlighting for python?  
   Header  
   for item in items:  
    print(item)  
   ....  
     
   **Answer: ```python**
2. What is the output of the following code fragment in a python cell in a Jupyter notebook?  
   items = [1,3,0,4,1]  
   items[1:3]  
     
   **Answer: [3,0]**

**Quiz on Pandas**

1. There are various ways to access the rows of panda’s data frame using indexing. Match the following into two methods to their respective purpose.  
    **iloc:** positional indexing  
   **lco:** label-based indexing
2. Data frames may be combined using pd.concat. Assuming we have the following two data frames  
   left\_frame = pd.DataFrame({'key': range(5), 'left\_value': ['a', 'b', 'c', 'd', 'e']})  
   right\_frame = pd.DataFrame({'key': range(3, 8), 'right\_value': ['f', 'g', 'h', 'i', 'j']})   
   and we then do the following pd.concat([left\_frame, right\_frame], axis=1)   
     
   How many rows will the resulting data frame have?  
    **Answer:** 5 **Tip:**Even if the data frames don’t have equal number of key values, for instance left has 5 and right has 3, the number of rows in the resulting data frame would be still 5

|  |  |  |  |
| --- | --- | --- | --- |
| **Key** | **Left\_value** | **Key** | **Right\_value** |
| 0 | 0.0 | 3.0 | F |
| 1 | 1.0 | 4.0 | G |
| 2 | 2.0 | 5.0 | H |
| 3 | 3.0 | NaN | NaN |
| 4 | 4.0 | NaN | NaN |

1. Assertion: Using the pandas function read\_csv, it is possible to directly read data from the clipboard into a data frame.  
   **Answer:** True
2. Assume we have a pandas data frame called movie\_ratings which contains a column called title. What would we have to replace the xyz in the following python code within order to see the 10 most often rated movies?  
   movie\_ratings.groupby(‘title’).size().sortvalues(xyz=False)[:10]  
   **Answer:** Ascending

**Quiz on ML 101**

1. **For decision trees, information gain is an important quantity. Which of the following is a true statement about information gain?**Select one or more
   1. As a split node, we take one with an adequate information gain
   2. **Information gain is computed for the nodes under consideration for a split**
   3. Information gain measures the importance of the tree for an analytical problem.
   4. **Information gain may also be though of as a measure for the decrease of impurity**

**Answer:** a & d

1. **Which of the following assertions about the quantity recall is true?  
   Select one or more:** 
   1. **It can be easily calculated from the entries in the confusion matrix**
   2. b. It is a quality metric for clustering
   3. **It measures the ratio of correctly predicted samples of a class to the total number of samples in the class**
   4. d. It measures the ratio of correctly predicted samples of a class to the total number of predicted samples in the class

**Answer:** a & c

1. State whether the following assertion about cross-validation is true or false:  
   To determine the hyperparameter k, we would use the crossing method  
   **Answer:** False

**Quiz on Neural Network**

1. **What is the main idea in stochastic gradient descent?  
   S**elect one:
   1. random weight adjustments
   2. mini batches
   3. probable activations

**Answer:** mini batches

1. **What makes a neural network deep?  
   Answer:** Deep layer
2. **What is the role of bias in a neural network?**Select one:
   1. It means that a particular input is favoured
   2. It serves to equally distribute the weights.
   3. Bias means adding a constant to the net input (the bias's weight).

**Answer:** C

**Quiz on Intro to CV**

1. **Among other things, good features are characterized by ...   
   Select one or more:** 
   1. Coloured
   2. Quantity
   3. Boxed
   4. Distinctiveness
   5. Repeatability

**Answers:** Quantity, Distinctiveness, Repeatability

1. Haar cascades are used for object detection in OpenCV. They are based on a classical machine learning approach, namely ....   
   Which word should the ellipsis be replaced by?  
   **Answer:** ensemble
2. Gaussian Blur can be used for denoising in the context of edge detection.  
   **Answer:** True

**Quiz on CNN**

1. In the context of CNN, by padding images, we can ...   
   **Select one or more**:
   1. ... avoid that pixels on the edge of images have less influence than inner ones
   2. ... automatically compensate for bias
   3. ... prepare data augmentation.
   4. ... make sure that the dimensions of input and output are the same.
   5. e. ... avoid Overfitting

**Answer:**

1. **The learning method which employs pretrained models is commonly known as ...  
   Answer:** Transfer Learning
2. **In order to reduce the dimension of a CNN as well as to mitigate overfitting, we use [put answer here]  
   Answer:** pooling layers
3. **Dropout means that in order to make a prediction, we only rely on part of the available neurons.  
   Answer:** False

**Special quiz DASU**

1. **What does the acronym DASU stand for?**
   1. Datenanalysen Sicher Umsetzen
   2. Data Analytics Scientific Users
   3. Data Science Usergroup
   4. Transferzentrum für Digitalisierung, Analytics & Data Science Ulm

**Answer:** d

1. **Which of the following institutions started the DASU initiative?**
   1. Technische Hochschule Ulm
   2. Universität Ulm
   3. IHK Ulm
   4. Stadt Ulm
   5. DRK Ulm

**Answer:** a,b,c,d

1. **Is it possible to start one's career at DASU?** 
   1. No, unfortunately not
   2. Yes, as evidenced on the career page of the website. ​

**Answer:** b