**Department of Artificial Intelligence and Data Science**

**Introduction to Artificial Intelligence and Data Science**

**Mid II Examinations June 2023**

**Bit Bank**

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**UNIT III:**

1. A semantic network is \_\_\_\_\_\_\_ [ ]

a) A way of representing knowledge b) Data Structure c) Data Type d) None of these

1. Graph used to represent semantic network is \_\_\_\_\_\_\_\_\_\_\_\_\_ [ ]

a) Undirected graph b) Directed graph c) Directed Acyclic graph d) cycle graph

1. Which of the following are the Semantic Relations used in Semantic Networks? [ ]

a) Meronymy b) Holonymy c) Hyponymy d) All of the mentioned

1. The basic inference mechanism in semantic network is to follow the links between the nodes. [ ]

a) True b) False

1. There exists two ways to infer using semantic networks - Intersection Search and Inheritance Search [ ]

a) True b) False

1. Following is an extension of semantic network [ ]

a) Expert systems b) Rule based expert systems c) Decision tree based neworks

d) Partitioned networks

1. Among the given options, which is also known as the inference rule? [ ]

a) Reference b) Reform c) Resolution d) None of the above

1. Among the given options, which is also known as the inference rule? [ ]

a) Reference b) Reform c) Resolution d) None of the above

1. What are the limitations of semantic networks? [ ]

a) Intractability b) Lack in expressing some of the properties c) Incomplete

d) Has memory constraints [ ]

1. Which process makes different logical expressions look identical? [ ]

a) Lifting b) Unification c) Inference process d) None of the mentioned

1. Where did all the facts are stored to implement to store and fetch function [ ]

a) Database b) Knowledge base c) Datamart d) All of the mentioned

1. Which of the following options is used to build complex sentences in knowledge representation. [ ]

a) Symbols b) Connectivities c) Quantifier d) None of these

1. Automatic Reasoning tool is used in\_\_\_\_\_ [ ]

a) Personal Computers b) Microcomputers c) LISP Machines d) All of the above

1. The inference engine works on \_\_\_\_\_\_. [ ]

a) Forward Chaining b) Backward Chaining c) Both a and b d) None of the above

1. Translate the following statement into FOL. [ ]

“For every a, if a is a philosopher, then a is a scholar”

a) ∀ a philosopher(a) scholar(a) b) ∃ a philosopher(a) scholar(a)

c) All of the mentioned d) None of the mentioned

**UNIT IV:**

1. Which of the following is performed by a Data Scientist? [ ]

a) Define the question b) Create reproducible code c) Challenge results

d) All of the mentioned

1. Raw data should be processed only one time [ ]

a) True b) False

1. Which of the following gave rise to the need of graphs in data analysis? [ ]

a) Data visualization b) Communicating results c) Decision making

d) All of the mentioned

1. Amongst which of the following is true with reference to Pip in Python? [ ]

a) Pip is a standard package management system

b) It is used to install and manage the software packages written in Python

c) Pip can be used to search a Python package

d) All of the mentioned above

1. What does Numpy stand for? [ ]

a) Numerical Python b) Natural Python c) Numeric program d) Non linear python

1. What is the default data type of NumPy arrays? [ ]

a) int32 b) float64 c) object d) None of the above

1. What is the output of the following code? [ ]

import numpy as np

a = np.arange(10)

print(a[2:5])

a) [2, 3, 4] b) [0, 1, 2] c) [5, 6, 7] d) [2, 4, 6]i

1. Which of the following is used to create an identity matrix in NumPy? [ ]

a) zeros() b) ones() c) arange() d) eye()

1. What is the output of the following code? [ ]

import numpy as np

a = np.array([[1, 2], [3, 4]])

print(a)ndim)

a) 0 b) 1 c) 2 d) 3

1. Which of the following is used to reshape a NumPy array? [ ]

a) reshape() b) resize() c) Both A and B d) None of the above

1. What is the output of the following code? [ ]

import numpy as np

a = np.array([1, 2, 3])

b = np.array([4, 5, 6])

c = np.stack((a, b))

print(c)

a) [[1, 2, 3], [4, 5, 6]] b) [[1, 4], [2, 5], [3, 6]] c) [1, 2, 3, 4, 5, 6] d) Error

1. Which of the following is used to find the maximum element in a NumPy array? [ ]

a) large() b) max() c) len() d) mx()

1. *import numpy as np*

*a = np.array([1, 2, 3])*

*b = np.array([4, 5, 6])*

*c = a + b*

*print(c)*  [ ]

a) [1, 2, 3, 4, 5, 6] b) [[1, 4], [2, 5], [3, 6]] c) [5, 7, 9] d) Error

1. Which of the following stacks 1D arrays as columns into a 2D array? [ ]

a) row\_stack b) column\_stack c) index\_stack d) both b and c

1. What will be output for the following code? [ ]

*import numpy as np*

*dt = dt = np.dtype('i4')*

*print dt*

A. int32 B. int64 C. int128 D. int16

1. ndarray is also known as alias array [ ]

a) True b) False

1. Which of the following methods creates a new array object that looks at same data?[ ]

a) view b) copy c) paste d) All of the mentioned

1. Numpy array can be \_\_\_\_\_ [ ]

a) Sliced b) Indexed c) Iterated d) None of these

1. *import numpy as np*

*arr = np.array([1, 2, 3, 4, 5, 6, 7])*

*print(arr[1:7:2])*

What will be printed? [ ]

a) [1 3 5 7] b) [1 3 5] c) [2 4 6] d) [2 3 4]

1. *import numpy as np*

*arr = np.array([1, 2, 3, 4, 5, 6, 7])*

*print(arr[4:])* [ ]

a) [5 6 7] b) [4 5 6 7] c) [1 2 3 4] d) [1 2 3]

1. *import numpy as np*

*arr = np.array([1, 2, 3, 4, 5, 6, 7])*

*print(arr[-4:-1])*

*What is output?* [ ]

a) [1 2 3 4] b) [4 3 2 1] c) [4 5 6] d) None of these

1. *import numpy as np*

*arr = np.array([[1, 2, 3, 4, 5], [6, 7, 8, 9, 10]])*

*print(arr[1, 1:4])* [ ]

a) [2 3 4] b) [1 2 3] c) [7 8 9] d) [6 7 8]

1. import numpy as np

arr = np.array([[1, 2, 3, 4, 5], [6, 7, 8, 9, 10]])

print(arr[0:2, 2]) [ ]

a) [2 7] b) [3 7] c) [3 8] d) None of these

1. Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array? [ ]

a) argmax() and argmin() b) max() and min() c) amax() and amin()d) None of the above

1. Amongst which Python library is similar to Pandas? [ ]

a) NPy b) RPy c) NumPy d) None of the mentioned above

1. Which of the following functions is used to create a masked array? [ ]

a) mask() b) masked() c) mask\_array() d) masked\_array()

1. What is the output of the following code? [ ]

x = np.array([1, 2, 3, 4])

mask = x > 2

print(mask)

a) [False False True True] b) [True True False False ] c) [True True]

D) [False False]

1. What is the output of the following code? [ ]

*import numpy*

*x=numpy.([1,2,3,4,5])*

*mask = (x > 2) & (x < 5)*

*print(mask)*

a) [False True True True False ] b) [True True]c) [False False True True False] d) None

1. What is the output for the following code? [ ]

*import numpy as np*

*x=np.array([4,6,2,8])*

*print(np.median(x))*

a) 8 b) 5 c) 4 d) 6

1. What is the output for the following code? [ ]

*import numpy as np*

*x=np.array([[1,2] , [3,4]])*

*y=np.array([ [5,6],[7,8]])*

*z=(x\*y)*

*print(z)*

a) [ [5,12], [21,32] ] b) [ [60], [1680] ] c) [ [6,8], [10,12] ] d) [ [3,8], [35,48] ]

**UNIT V:**

1. Which of the following commands is used to install pandas? [ ]

a) pip install pandas b) install pandas c) pip pandas d) None of the above

1. A \_\_\_\_\_\_\_\_ is a one dimensional data [ ]

a) Series b) DataFrame c) Panel d) DataSet

1. A Series by default have numeric data labels starting from \_\_\_\_\_\_\_ [ ]

a) 1 b) 0 c) NULL D) NAN

1. The data label associated with a particular value of series is called its \_\_\_\_ [ ]

a) Data value b) Value c) Index d) Pointers

1. In pandas \_\_\_\_ is used to store data in multiple columns [ ]

a) Series b) DataFrames c) Both Series and DataFames d) List

1. \_\_\_\_ data structure has both row and column index [ ]

a) list b) Series c) DataFrame d) None of the above

1. Which library is to be imported for creating DataFrame? [ ]

a) Numpy b) matplotlib c) Random d) Pandas

1. Which of the following function is used to create DataFrame? [ ]

a) NewDataFrame() b) NewFrame() c) newData() c) DataFrame()

1. The following code create a dataframe named ‘D1’ with \_\_\_\_ columns [ ]

*import pandas as pd*

*D1=pd.DataFrame(0,1,2,3])*

a) 1 b) 2 c) 3 d) 4

1. Which of the following is used to give a user defined column index in DataFrame? [ ]

a) index b) Col\_index c) Column\_index d) col\_index

1. When we create DataFrame from list of Dictionaries, then dictionary keys will become [ ]

a) Row labels b) index labels c) Column labels d) Both a and b

1. In the given code then dataframe D1 has \_\_ rows and \_\_ columns [ ]

*Import pandas as pd*

*data={“Name”:[‘a’,’b’,’c’},”Age”:[24,22,23,34]}*

*D1=pd.DataFrame(data)*

a) 3,4 b) 4,3 c) 4,4 d) Code is syntactically wrong

1. We can create a DataFrame using single Series [ ]

a) True b) False

1. In DataFrame, by default the new column as the \_\_\_\_\_ column [ ]

a) First b) Second c) Random d) Middle

1. Which method is used to delete row or column in DataFrame? [ ]

a) delete() b) del() c) cut() d) drop()

1. To delete a row, the parameter axis of function drop() is set to \_\_\_\_\_\_ [ ]

a) 0 b) 1 c) 2 d) -1

1. To delete a column, the parameter axis of function drop() is set to \_\_\_\_\_\_ [ ]

a) 0 b) 1 c) 2 d) -1

1. Which method is used to change the labels of rows and columns in a dataframe? [ ]

a) rename() b) change() c) replace() d) alias()

1. The parameter axis = “index” of rename() function is used to specify that the [ ]

a) row and column to be changed b) column label to be changed

c) row label to be changed d) None of these

1. DataFrame.loc() is used for \_\_\_\_ with DataFrames [ ]

a) Label based indexing b) Boolean based indexing c) Both a and b d) None of these

1. The following statement display \_\_\_\_ rows of data frame? [ ]

*print(df.loc[[True,False,True]])*

a) 1 b) 2 c) 3 d) 4

1. \_\_\_\_\_\_\_\_ method is used to merge two dataframes [ ]

a) merge() b) join() c) add() d) append()

1. We can merge/join two data frame if and only if has same number of columns [ ]

a) True b) False

1. \_\_\_ attribute of DataFrame is used to display the dimension of DataFrame [ ]

a) shape b) size c) dimension d) values

1. \_\_\_\_ is used to display the first two rows of a dataframe [ ]

a) df.head() b) df.header(2) c) df.head(-2) d) df.top(-2)

1. Pandas DataFrame is size\_\_\_ and value \_\_\_\_ [ ]

a) Mutable, Mutable b) Immutable, Immutable c) Immutable, Mutable

d) Mutable, Immutable

1. The function to fill NAN values with 100, if df is the dataframe object. [ ]

a) fillna(100) b) df.fillna(100) c) df.fillna(‘100’) d) df.fill(100)

1. Which of the following function is used to drop with NAN values [ ]

a) df.drop() b) df.dropna() c) df.delete() d) df.deletena()

1. \_\_\_\_\_\_can be used to detect missing values for a dataframe object df. [ ]

a) df.null() b) df.isnull() c) df.isempty() d) df.nonnull()

1. Which of the following attributes return all the values of Series? [ ]

a) size b) index c) name d) values

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**Question Bank**

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**UNIT III:**

1. In detail explain about mental events and mental objects? [L2] [6M]
2. “A user is buying a product online” Briefly explain what a shopping agent precept with respect to the internet shopping world? [ [L4] 6M]
3. In detail explain about semantic networks useful in representing knowledge? [L2] [6M]
4. What do you mean by description logic? How description logic is useful in knowledge representing systems [L2] [6M]
5. Write a short note on i) Ontological Engineering ii) Truth Maintenance Systems [L2] [6M]

**UNIT IV:**

1. a) What is data science? Draw and explain “Drew Conway’s Venn diagram of data science” [L3] [6M]

b) Write a short note on i) Big data ii) Datafication [L2] [6M]

1. a) In detail explain about data exploratory analysis? [L2] [6M]

b) What is the role of a data scientist in the data science process? [L2] [6M]

1. a) What is Numpy? What are the advantages of Numpy arrays when compared to lists?

[L4] [6M]

b) Give the syntax to install numpy package? Write a python program to create a Numpy

array? [L3] [6M]

1. a) What data types are supported by the Numpy array? Explain briefly? [L2][6M]

b) Write a program to create ndarrays using Numpy? [L3][6M]

1. a) Write a python program to demonstrate scalar operations of Numpy arrays? [L4] [6M]

b) Write a python program to create a Numpy array and implement resize() and

reshape() functions ? [L3][6M]

1. With suitable examples explain about indexing and slicing operations on Numpy arrays?

[L4][12M]

1. With suitable examples explain about data processing tasks using numpy package? [L4] [12M]
2. a) With suitable examples explain the following i) Boolean indexing ii) Fancy indexing [L2][6M]

b) Write a python program to create a numpy array and sort the elements into ascending order and descending order? [L2] [6M]

1. a) With suitable examples explain about various built in numpy array functions? [L2] [6M]

b) How random numbers are generated using python? Write a program to generate

random numbers between 1 to 100 using the numpy package? [L3] [6M]

**UNIT V:**

1. a) In detail explain the architecture of the pandas library? [L2] [6M]

b) Discuss about features and application of pandas? [L2] [6M]

1. a) What is Series? Write a program to demonstrate the process of creating a series using pandas? [L3] [6M]

b) With suitable examples explain the process of indexing and selecting data in Series?

[L2] [6M]

1. a) What is a Data Frame? How is Series different from Data Frame? [L3] [6M]

b) Write a program to create a DataFrame from a csv file? Explain about various

features of the Data Frame? [L3] [6M]

1. a) How dropna() and fillna() are useful in handling missing data of DataFrame?[L3] [6M]

b) How to add a new column to the existing DataFrame? Explain with a suitable code?

[L2][6M]

1. a) How to access rows and columns of DataFrame? Write a program to drop an existing column from the DataFrame? [L3][6M]

b) Write a program to calculate aggregate values of a numpy array? [L3] [6M]

1. a) Give the syntax to create a DataFrame using i) List of lists ii) List of Dictionaries

[L2] [6M]

b) How to add columns names to the existing DataFrame which was created using list of lists [L2] [6M]

1. Create a sample DataFrame for student report which contains atleast 6 columns.Display the aggregate values of each column using python code? [L5][6M]
2. a) How Panel is different from the DataFrame? In detail explain about creating a Panel?

[L4][6M]

b) How to drop a column(s) or row(s) in DataFrame? Explain with a sample code?

[L3] [6M]

1. Create a sample DataFame for a company which contains stores all over India? Explain about sorting and ranking using the above company DataFrame? [L5][12M]
2. a) How loc() and iloc() functions are useful in accessing data from DataFrame. [L3] [6M]

b) Write a program to demonstrate the concept of reindexing in DataFrame? [L3][6M]