Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

CS3ED03 Data Visualization

Programme: B.Tech. Branch/Specialisation: CSE / All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. The most popular data visualization library in python is _____. **1**

(a) matinfolib (b) matplotlib (c) pip (d) matpiplib

ii. The process of representing data is called _____ **1**

(a) Data Collection (b) Data Analysis

(c) Data Visualization (d) All of these

iii. What is fisheye degree view? **1**

(a) 90 degree (b) 180 degree (c) 360 degree (d) None of these

iv. Types of computer graphics are- **1**

(a) Vector and raster (b) Scalar and raster

(c) Vector and scalar (d) None of these

v. Which method shows hierarchical data in a nested format? **1**

(a) Treemaps (b) Scatter plots

(c) Population pyramids (d) Area charts

vi. Which of the following equation is used in 2D translation to move a point(x,y) to the new point (x',y')? **1**

(a) x' = x + ty and y' = y + tx

(b) x' = x - tx and y' = y - ty

(c) x' = x + tx and y' = y + ty

(d) x' = x + tx and y' = y - ty

vii. Rendering means- **1**

(a) Transferring 3D to 3D

(b) Process of generating an image from a 2D or 3D

(c) Story board making

(d) Cut out animation making

P.T.O.

viii. What problems does 3D image visualization solve? **1**
(a) Virtually reproducing a scanned object
(b) Data set representation
(c) Text data
(d) None of these

ix. Which one of the following is a most basic and commonly used technique? **1**
(a) Line charts (b) Scatter plots
(c) Population pyramids (d) Area charts

x. Ram want to create scatter chart for the given data **e1**
X=[11,22,33,44]
Y=[23,21,16,29]
Help him to write correct code (important libraries are imported)
(a) plt.plot(X,Y,'O')
(b) plt.scatter(X,Y)
(c) df=pd.DataFrame({'c1':X,'c2':Y})
df.plot(kind=scatter,X='c1',Y='c2')
(d) All of these

Q.2 i. What is data visualization? What are the advantages of data visualization in comparison to old methods? **4**
ii. Why is data cleansing important for data visualization? **6**
OR iii. Explain the principles data visualization. **6**

Q.3 i. Explain how to select a particular view of data. Also explain how to modify the views. **4**
ii. What is a fisheye view? Explain the fisheye view for 3D data. **6**
OR iii. Define abstraction in computer graphics and abstraction in user interfaces. **6**

Q.4 i. How can you visualise more than three dimensions in a single chart? **4**
ii. What is tree visualization? Explain classes of tree visualization. **6**
OR iii. Define the terms legend, interval, axes and scales in a chart. **6**

Q.5 i. What is continuous time-series visualization and discrete event visualization? **4**
ii. What is the importance of text visualization? How to create text data visualization with examples? **6**
OR iii. Why interactive 3D illustrations use for images and text? Justify your answer. **6**

Q.6 i. What is a scatter plot? For what type of data is scatter plot usually used for? **4**
ii. Explain D3 scales. Define loading and parsing data with D3.js. **6**
OR iii. Explain the difference SVG and CANVAS with example. **6**

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Marking Scheme
CS3ED03 Data Visualisation

Q.1	i)	The most popular data visualization library in python is _____ **Answer:** b. matplotlib	**1**
	ii)	The process of representing data is called _____ **Answer:** c. Data Visualization	**1**
	iii)	What is fisheye degree view? **Answer:** b) 180 degree	**1**
	iv)	Types of computer graphics are **Answer:** a) Vector and raster	**1**
	v)	Which method shows hierarchical data in a nested format? **Answer:** a. Treemaps	**1**
	vi)	Which of the following equation is used in 2D translation to move a point(x,y) to the new point (x',y')? **Answer:** c. x' = x + tx and y' = y + ty , (b) x' = x - tx and y' = y - ty	**1**
	vii)	Rendering means **Answer:** b. Process of generating an image from a 2d or 3d	**1**
	viii)	What problems does 3D image visualization solve? **Answer:** a) Virtually reproducing a scanned object	**1**
	ix)	Which one of the following is a most basic and commonly used technique? **Answer:** a. Line charts	**1**
	x)	Ram want to create scatter chart for the given data X=[11,22,33,44] Y=[23,21,16,29] Help him to write correct code (important libraries are imported) **Answer:** d) All of the above	**1**
Q.2	i.	What is data visualization? What are the advantages of data visualization in comparison to old methods? What is data visualization 2 marks Advantages 2 marks (min 4 advantages 0.5 for each)	**4**
	ii.	Why is data cleansing important for data visualization? Reasons 2 marks Importance 4 marks	**6**
OR	iii.	Explain the principles data visualization? Minimum 6 principles 1 marks for each	**6**
		(i.e Do not distort quantities ,Encoding data using visual cues, Know when to include 0, Order categories by a meaningful value, Show the data, Ease comparisons , Think of the color blind and many more)	
Q.3	i.	Explain how to select a particular view of data. Also explain how to modify the views? a particular view of data 2 marks to modify the views 2 marks	**4**
	ii.	What is a fisheye view? Explain the fisheye view for 3D data? What is a fisheye view? 2 marks Explain the fisheye view for 3D data 4 marks	**6**
OR	iii.	Define abstraction in computer graphics and abstraction in user interfaces? Define abstraction in computer graphics 3 mark abstraction in user interfaces? 3 marks	**6**
Q.4	i.	How can you visualise more than three dimensions in a single chart? 3D visualization 2 marks Diagram 1 marks Chart 1 marks Ans: Usually, the data is represented in the charts using height, width and depth in the images, to visualise more than three dimensions we make use of visual cues like colour, size and shape or sometimes animations for depicting changes through time.	**4**
	ii.	What is tree visualization? Explain classes of tree visualization? What is tree visualization? 2 marks Explain classes of tree visualization? 4 marks	**6**
OR	iii.	Define the terms legend, interval, axes, and scales in a chart? Define the terms legend, 1.5 marks interval, 1.5 marks axes 1.5 marks scales 1.5 marks	**6**
Q.5	i.	What is continuous time-series visualization and discrete event visualization? What is continuous time-series visualization 2 marks discrete event visualization? 2 marks	**4**

	ii.	What is the importance of text visualization? How to create text data visualization with examples? What is the importance of text visualization? 2 marks How to create text data visualization with examples? 3 marks Example 1 mark	**6**
OR	iii.	Why interactive 3D illustrations use for images and text? Justify your answer? Why interactive 3D illustrations use for images and text? 4 marks Justification 2 marks	**6**
Q.6	i.	**What is a scatter plot? For what type of data is scatter plot usually used for?** What is a scatter plot? 2 marks For what type of data is scatter plot usually used for? 2 marks	**4**
	ii.	Explain D3 scales? Define loading and parsing data with D3.js? Explain D3 scales? 2 marks Define loading data with D3.js 2 marks parsing data with D3.js? 2 marks	**6**
OR	iii.	**Explain the difference SVG and CANVAS with example?** 1 marks for each difference (max 4) 4 marks Example 2 marks	**6**

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