**1) a) What are the different ways to create vectors?**

**b) Create vector v: (3,8,4,5,0,11, -9, 304) and perform following operations:**

1. **Sort the elements of v in decreasing order.**
2. **Print the length and type of the vector v**
3. **Check whether 11 is present in vector v**
4. **Print the length and type of vector v.**
5. **Create v1(3,8,4,5,0,11) & v2 (4,11,0,8,1,2): add, subtract, multiply, division**

**2) a) Explain Dataframe in R.**

**b) Create Data Frame “my\_data\_frame” with following information:**

**animal( sheep, pig, sheep, pig, sheep, pig), year (2019,2020,2021, 2019,2020,2021),**

**weight (110, 120, 140, NA, 300, 800), height(2.2, 2.4, 2.7, 2, 2.1, 2.3) ,**

**condition( “excellent", "good", NA, "excellent", "good", "average”)**

**1. Print class and structure of my\_data\_frame**

**2. Get the summary statistics for each variable of my\_data\_frame**

**3. Add the new observation: animal = "pig", year = 2018, weight = 200, height = 1.9, condition = "excellent"**

**4. Print the following output using subsetting : 110**

**3) a) How to import data from .csv file in R? .**

**b) Write R-code to perform Descriptive Data Analysis on ‘iris’ Dataset to compute the following:**

**1. Display the structure of dataset and first six observations**

**2. Find minimum, maximum and range of Sepal.Length**

**3. Find Mean, Median and Mode on Sepal.Length**

**4. Find First and third quartile and Interquartile range**

**5. Find Standard deviation and variance**

**4) Explain dataframe in R . Create a DataFrame “stats” with following information:**

**Player('A', 'B', 'C', 'D', 'A', 'A'), Runs(100, 200, 408, 19, 56, 100), Wickets(17, 20, NA, 5, 2, 17)**

**Perform the following operations using the functions of ‘dplyr ‘package:**

1. **Fetch the data of players who scored more than 100 runs**
2. **Remove duplicate rows from data frame**
3. **Arrange data based on runs low to high**
4. **Display the wickets taken by each player**
5. **Change the column name “runs” to “runs\_scored” in stats data frame.**

**5) Explain pie chart. Write R script to create Pie chart for following information:**

**The tax revenue of India (in crores of Rs.), as provided in 1984-85 budget, when broken into various sources are given below.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sources** | **Excise** | **Custom** | **Corporation tax** | **Income tax** | **Other** |
| **Tax revenue** | **6526** | **7108** | **2568** | **560** | **763** |

**6) a) Explain Layers of ggplot2 package.**

**b) Create a scatterplot ‘Sepal.Length vs Petal.Length’ on “iris” dataset using ggplot2 package. Add colour to the points based on types of species.**

**7) a)Write benefits of using word cloud for visualization.**

**b)Create a word cloud for text file present at given url:**

[**http://www.sthda.com/sthda/RDoc/example-files/martin-luther-king-i-have-a-dream-speech.txt**](http://www.sthda.com/sthda/RDoc/example-files/martin-luther-king-i-have-a-dream-speech.txt)

**8) What is waffle chart? Prepare a Waffle Charts for the following information.**

**Dataset of 91822 persons categorized as:**

**Infants <1 = 16467  
Children <11 = 30098  
Teens 12-17 = 20354  
Adults 18+ = 12456  
Elderly 65+ = 12456**

**9) a) Write different packages used for creating maps in R.**

**b) Write a R script to plot the cities “Patna”, “New Delhi”, “Chennai” on India map using mapview Package in R.**