Question Paper

Exam Date & Time: 05-Jan-2023 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SEVENTH SEMESTER B.TECH MAKEUP EXAMINATIONS, JAN 2023

ADVANCED DATA SCIENCE - PART III [CRA 4062]

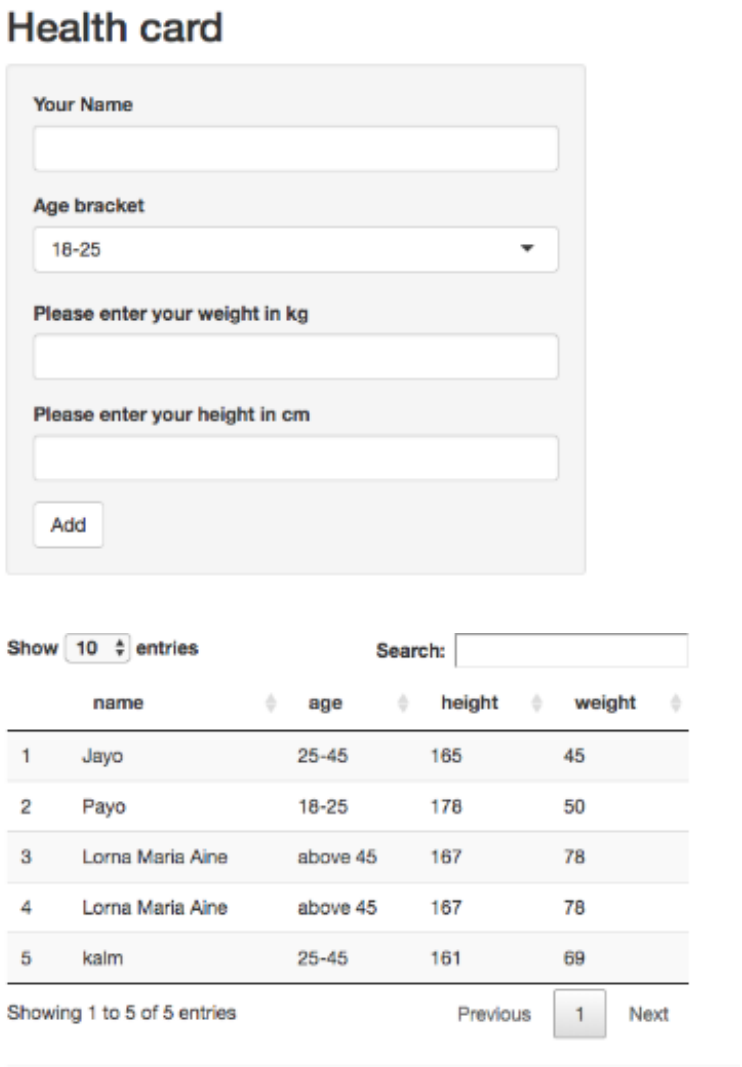
Marks: 50 **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1)	A)	Write R code to perform the following tasks using caret package. Load the "vowel.train" and "vowel.test" data sets available in "ElemStatLearn" library. Set the variable y to be a factor variable in both the training and test set. Set the seed to 33833. Fit a random forest predictor and a boosted predictor using the "gbm" method, relating the factor variable y to the remaining variables with the train() command. Print the accuracy among the test set samples where the two methods agree.	(5)
	B)	Illustrate the steps to plot first two principal components of a given data in R? Explain with R packages used to serve the above purpose.	(3)
	C)	Illustrate the quantmod package for finance related predictions with an example.	(2)
2)	A)	With suitable R code snippet perform the following operations i. Create dummy variables ii. Remove Zero Covariates iii. Create Splines using polynomial function	(5)
	B)	Mention the specific patterns to be considered for time series data. Mention the outcome of the following commands i. ma(ts, order=3) ii. ets(train, model="MMM")	(3)
	C)	Differentiate k - fold and leave one out cross-validation techniques with suitable examples.	(2)
3)	A)	Develop R code using Shiny framework to create a web page for health care system as shown in Figure.	(5)



B) Explain the sample division guidelines for large, medium and small sample size. (3)

C) With the help of R code snippet show how to remove zero covariates. (2)

4) For the following piece of code, create server.R reactive to the inputs from ui.R (5)

A) App 1: ui.R

```
library(shiny)
fluidPage(
titlePanel("Data science FTW!"),
sidebarLayout(
sidebarPanel(
h3("Sidebar Text")
),
mainPanel(
h3("Main Panel Text")
)
)
```

)

App 1: server.R

```
library(shiny)

function(input, output){

}
```

B) Explain the different input types of Shiny. (3)

C) For the data given below, use googleVis and geochart to match the functionality of Leaflet. (2)

```
head(Exports)

## Country Profit Online

## 1 Germany 3 TRUE

## 2 Brazil 4 FALSE

## 3 United States 5 TRUE

## 4 France 4 TRUE

## 5 Hungary 3 FALSE

## 6 India 2 TRUE
```

5) Develop a shiny web application which creates the slider and display the slider values in the UI. The slider must accepts the user inputs and the server must return the values. (5)

A)

B) List the plotting functions in googleVispackage. (3)

C) Explain addmarkers() in leaflet with an example. (2)

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