



**JOINT AICTE-GTU ONLINE FACULTY
DEVELOPMENT PROGRAMME
ORGANIZED BY**



**SHRI CHIMANBHAI PATEL POST GRADUATE INSTITUTE OF COMPUTER
APPLICATIONS, AHMEDABAD, GUJARAT**

On

“Training on Data Science Tools” (21st – 26th March 2022)

REPORT

Shri Chimanbhai Patel Post Graduate Institute of Computer Applications conducted an online FDP on “**Training on Data Science Tools**”- in association with AICTE and GTU from 21st March 2022 to 26th March 2022. This 6-day programme was graced by Eminent Faculty Members, Industry Experts, and Resource Persons from across the state. A valuable academic environment was experienced by the participants. This FDP program focused on the tools useful for applying Data Science principles with a special emphasis on open-source tools like Python and R. The FDP also covered the modalities and role of HEIs in the implementation of newly announced education policy.

The convener of the FDP was Dr. Hardik Soni, and it was coordinated and hosted by Prof. Harish Morwani. Dr. Sarika Srivastava coordinated the FDP from the University’s end.

About Institute

Shri Chimanbhai Patel Post Graduate Institute of Computer Applications (SCPPGICA) comes under the aegis of Sardar Vallabhbhai Education Trust (SVET). SVET was established in 1978 with the main objective of providing higher education without any discrimination of caste, colour, creed, or religion, and to develop a healthy as well as critical attitude towards mental, physical, and moral development of students. SVET was founded by Late Shri Chimanbhai Patel, former Chief Minister of Gujarat. Late Dr. Urmilaben Patel, an educationalist and social worker, served as the Managing Trustee of SVET. SCPPGICA is affiliated with GTU to offer MCA programme approved by AICTE since 2001.

About the FDP:

Shri Chimanbhai Patel Post Graduate Institute of Computer Applications, Ahmedabad conducted this FDP to enable participants to learn and conceptualize Data science in various areas like Marketing, Healthcare, Decision Making etc. Data Science– An interdisciplinary field, that deals with processes and systems that are used to extract knowledge or insights from large amounts of data.

The FDP was well-structured with sessions ranging from Introduction of Data Science to Statistics followed by basics of R, Python and Data Wrangling and Data Visualization with Python and R. Besides, the FDP covered industry applications of Data Science across the

verticals. Moreover, the sessions on the New Education Policy - 2020 in the FDP were incorporated to prepare the faculty members for embracing the changes in the Education System.

Day wise Summary:

The FDP began with an introductory session on Data Science by Prof. Harish Morwani to cover the basics of Data Science. Dr. Rutvi Shah conducted two sessions on basics of Python programming after the introductory session. To address the participants from non-technical background, the sessions covered content varying from installation to functions in Python language.

To cover the statistical aspects in Data Science, Dr. Kedar Bhatt conducted two sessions covering the basics of statistics and advanced statistics concepts on day 2 of the FDP. Subsequently, a hands-on session on Data Wrangling with 'Pandas' was steered by Dr. Hardik Soni.

Day 3 of the FDP began with two back-to-back sessions on Data Visualization and Visual Analytics using Python. With the introduction of visualization libraries like 'Matplotlib' and 'SeaBorn', plotting and interpretation of major statistical graphs were discussed by Dr. Hardik Soni. The day concluded with a session on NEP by Dr. Priyanka Pathak. The session covered the challenges and opportunities in implementation of the NEP-2020.

The focus of the FDP shifted from Python to R – another popular open-source tool for data science on day 4 of the FDP. The day commenced with a session by Dr. Nirav Halvadia to cover the basics of R language. The next session was conducted by Dr. Vipul Patel, who had described the packages viz., 'ggplot' and 'dplyr' to cover data exploration and data visualization using R language. The day finished with a session by Dr. Sanjay Kumar Vij, a renowned academician having more than 45 years of experience, to cover data wrangling with R packages. The session focused on how to handle erroneous and missing data to solve a data science problem.

The day 5 began with a session by Dr. Jonita Roman to cover data visualization using R 'Shiny' package. The session gave a glimpse of the potential of R shiny in developing web applications using R language and covered the visualization using R in depth. The remaining two sessions of day 5 were about giving the industry perspective to the participants for which an Industry expert Dr. Nidhi Arora having more than two decade's experience was roped in. She talked about various data science case studies at depth with participants. She also gave an overview of the job profile and a typical day of a Data Scientist at work along with various tools that are useful for a Data Scientist.

The final day of the FDP focused on NEP and the Industry applications of Data Science. The first session of the day was graced by Dr. Pankajray Patel from GTU. He talked about the positive impacts of NEP on the current education system. He discussed the loopholes in current education system and how they can be overcome by the NEP-2020. The second session was conducted by Dr. Nidhi Arora in which she covered the various use-cases of data science by discussing the problems that can be solved by data science across Industry verticals. The day concluded with a session by Prof. Harish Morwani to cover the nitty-gritties of the NEP with a special emphasis on the HEIs and their role as an important cog in the wheel of the NEP-2020.

This program was attended by more than 90 participants. Attendees included Academicians from various backgrounds. The feedback of the participants was excellent on all the experts and resource persons roped in. A letter of appreciation was provided to all the resource persons for their valuable contribution in this FDP. Certificates were sent online to the eligible participants after assessing the result of the examination conducted after the completion of the FDP program.

Outcome of the FDP:

- The participants were acclimatised to basic programming constructs used in Python and R Language.
- The participants got exposed to different domains wherein data science tools and techniques can be applied
- The participants were able to grasp in-depth understanding of Data Visualization using R Language (Packages like dplyr, ggplot, shiny, etc.)
- The participants were able to understand Data Visualization in Python (Libraries like Matplotlib, SeaBorn, etc.)
- The participants got a fair idea of how to perform data wrangling in python and R
- The participants got an overview of Data Science Tools commonly used by Data Scientists.

Resource Persons:

- Dr. Sanjay Kumar Vij - Dean (Academics), ITM University, Vadodara
- Dr. Nidhi Arora - Chief AI Officer, Fullstack Technology LLP (Industry Expert)
- Dr. Pankajray Patel - Director, GTU
- Dr. Hardik Soni - Director, SCPPGICA,
- Dr. Priyanka Pathak - Director CPIBA
- Dr. Vipul Patel – Professor and Academic Director, VU-GUNI Centre of Excellence, Ganpat University
- Dr. Nirav Halvadia - Associate Professor, VMPIM, Ganpat University
- Dr. Jonita Roman – Assistant Professor, ITM University, Vadodara
- Dr. Kedar Bhatt - Assistant Professor, CPIMR
- Dr. Rutvi Shah - Assistant Professor, CPICA
- Prof. Harish Morwani - Assistant Professor, SCPPGICA

Programme Schedule:

Dates	10:00 to 11:30 AM	12:00 to 1:30 PM	02:30 to 04:00 PM
21/03/2022	Session 1 Introduction to Data Science (Prof. Harish Morwani)	Session 2 Introduction to Python Environment (Dr. Rutvi Shah)	Session 3 Basic of Python Programming (Dr. Rutvi Shah)
22/03/2022	Session 4 Basic Statistics (Dr. Kedar Bhatt)	Session 5 Statistics for Data Science (Dr. Kedar Bhatt)	Session 6 Data wrangling with Pandas (Dr. Hardik Soni)
23/03/2022	Session 7 Data Visualization in Python (Dr. Hardik Soni)	Session 8 Visual Data Analysis (Dr. Hardik Soni)	Session 9 Challenges and Opportunities in implementing NEP (Dr. Priyanka Pathak)
24/03/2022	Session 10 Introduction to R Language (Dr. Nirav Halvadia)	Session 11 Data Exploration and Data Visualization in R (Dr. Vipul Patel)	Session 12 Data wrangling with R packages (Dr. Sanjay Kumar Vij)
25/03/2022	Session 13 Data visualization using R Shiny (Dr. Jonita Roman)	Session 14 Data Science Case Studies (Dr. Nidhi Arora)	Session 15 Going Steady the Data Science Way (Dr. Nidhi Arora)
26/03/2022	Session 16 Positive impact of NEP on the Education System (Dr. Pankajray Patel)	Session 17 Industry Applications of Data Science (Dr. Nidhi Arora)	Session 18 Role of HEIs in implementation of NEP (Prof. Harish Morwani)

Glimpses of the FDP:

What is Data Science?

What's in it for you

- ▶ Need for Data Science
- ▶ What is Data Science?
- ▶ Data Science vs Business Intelligence
- ▶ The Prerequisites for learning Data Science
- ▶ What does a Data Scientist do?
- ▶ Data Science lifecycle with example
- ▶ Demand for Data Scientist

Need For Data Science

This is where the Need For Data Science comes into picture. It is able to make better decisions!

You mean it will be able to take decisions like slowing down, stopping by itself, speeding up and all of that?

Exactly! And then let the machine learn using feedback each time using unsupervised learning!

That's interesting!

Python Indentation

- Indentation is used in Python to delimit blocks.
- The number of spaces is variable, but all statements within the same block must be indented the same amount.
- The header line for compound statements, such as if, while, def, and class should be terminated with a colon (:)
- The semicolon (;) is optional at the end of statement.

```

if True:
    print("Answer")
    print("True")
else:
    print("Answer")
    print("False")
    
```

- Python Syntax
- Python Indentation
- Python Comments
- Python Variables
- Exercises

Python Syntax

Types of Syntax Structures in Python

1. Python Line Structure

A Python program comprises logical lines. A NEWLINE token follows each of those. The interpreter ignores blank lines.

The following line causes an error.

```
print("Hi
How are you?")
```

Output: **SyntaxError: EOL while scanning string literal**
2. Python Multiline Statements


```
print("Hi\
how are you?")
```

Output: Hi how are you?
3. Multiple Statements in One Line


```
num1 = 10; num2 = 20; print("Sum of numbers = ", num1+num2)
```

Output: Sum of numbers=30

JOINT AICTE-GTU ONLINE FACULTY DEVELOPMENT PROGRAMME

Basic Statistics
Dr. Kedar Bhatt

SHRI CHIMANBHAI PATEL POST GRADUATE INSTITUTE OF COMPUTER APPLICATIONS, AHMEDABAD, GUJARAT

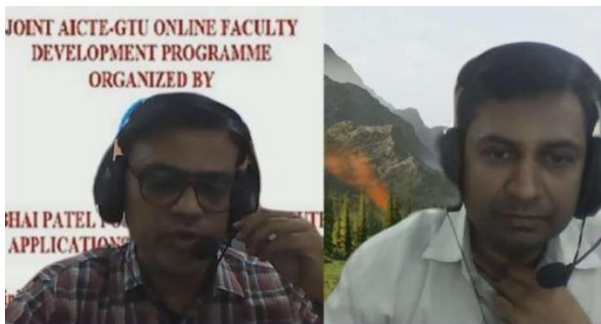
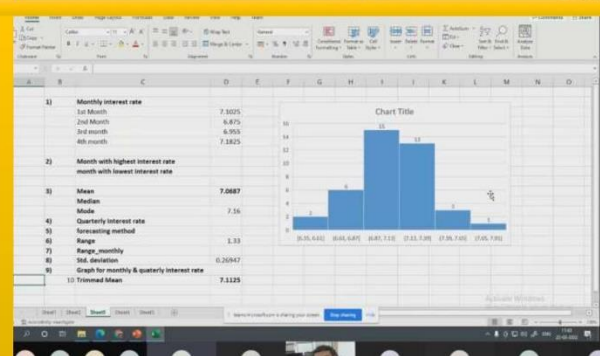


Levels of Data Measurement

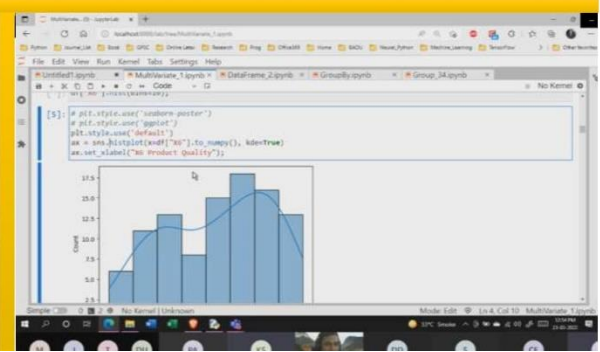
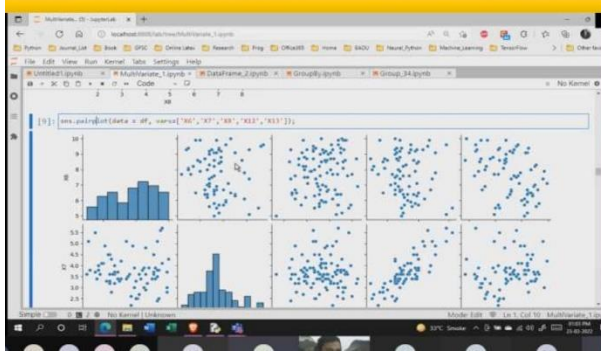
Interval -

- In interval measurement the **distance between attributes does have meaning.**
- Numerical data typically fall into this category
- For example, when measuring temperature (in Fahrenheit), the distance from 30-40 is same as the distance from 70-80. The interval between values is interpretable.
- There is no 'true' zero, only an 'arbitrary' zero

Handwritten notes:
 class → order difference
 size → 1.5 m
 30 → 1.5 m
 40 → 1.5 m
 100°C → 100°C
 100°C → 100°C
 100°C → 100°C
 100°C → 100°C



First Name	Gender	Start Date	Last Login Time	Salary	Bonus %	Senior Management
1981	Male	2012-02-17	10:25 AM	61902	11.588	True
327	Male	1984-01-28	8:46 AM	36719	5.887	True
448	Male	1980-07-22	2:03 PM	52178	11.243	True
992	Male	1988-01-22	7:09 PM	67109	16.424	True
102	Male	2014-05-21	1:42 AM	10207	19.100	True
962	Male	2001-09-21	7:52 PM	10207	5.102	True
925	Male	2002-09-22	4:19 PM	19908	10.188	True
946	Male	1982-08-19	1:02 AM	10423	6.841	True
962	Male	2012-07-28	10:27 AM	10203	5.100	True
911	Male	2015-05-14	9:15 AM	10008	5.902	True





JOINT AICTE-GTU ONLINE FACULTY
DEVELOPMENT PROGRAMME
ORGANIZED BY
SHRI CHIMANBHAI PATEL POST GRADUATE INSTITUTE OF COMPUTER
APPLICATIONS, AHMEDABAD, GUJARAT

On
"Training on Data Science Tools"

A Discussion on
Challenges and Opportunities in
Implementing NEP

Opportunities of NEP which will clear the Education mess

10. Equality and Inclusion in Higher Education (HEIs)

Steps to be taken by Governments:

- Earmark suitable Government funds for the education of SEDGs
- Set clear targets for higher GER for SEDGs
- Enhance gender balance in admissions to HEIs
- Enhance access by establishing more high-quality HEIs in aspirational districts and Special Education Zones
- Develop and support high-quality HEIs that teach in local/Indian languages or bilingually
- Provide more financial assistance and scholarships to SEDGs in both public and private HEIs
- Conduct outreach programs on higher education opportunities and scholarships among SEDGs
- Develop and support technology tools for better participation and learning outcomes.

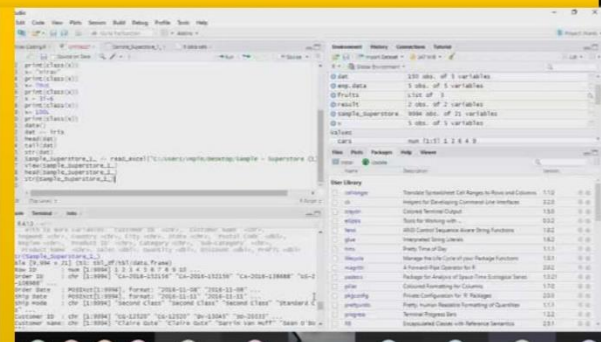
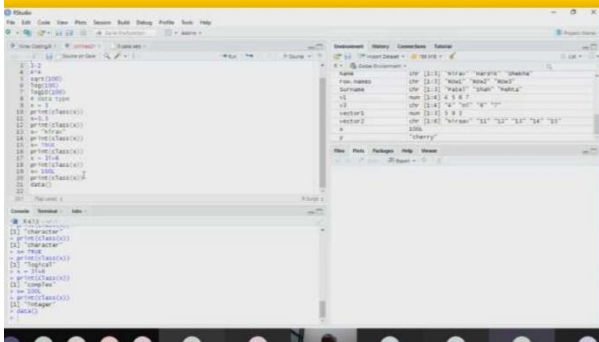
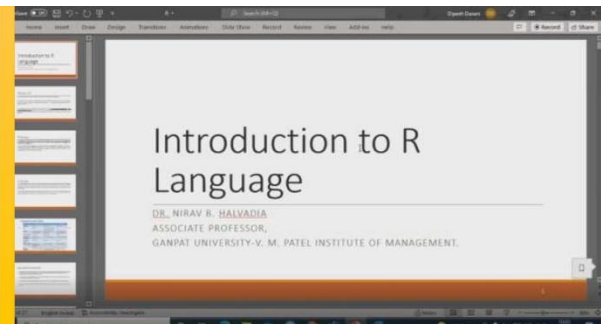
What is the New Education Policy (NEP)?

The Vision of this Policy

- This National Education Policy envisions an education system rooted in Indian ethos that contributes directly to transforming India, that is Bharat, sustainably into an equitable and Vibrant knowledge society, by providing high – quality education to all, and thereby making India a global knowledge superpower.
- The Policy envisages that the curriculum and pedagogy of our institutions must develop among the students a deep sense of respect towards the Fundamental Duties and Constitutional values, bonding with one's country, and a conscious awareness of one's roles and responsibilities in a changing world.
- The vision of the Policy is to instill among the learners a deep – rooted pride in being Indian, not only in thought, but also in spirit, intellect, and deeds, as well as to develop knowledge, skills, values, and dispositions that support responsible commitment to human rights, sustainable development and living, and global well – being, thereby reflecting a truly global citizen.



JOINT AICTE-GTU ONLINE FACULTY
DEVELOPMENT PROGRAMME
ORGANIZED BY
SHRI CHIMANBHAI PATEL POST GRADUATE INSTITUTE OF COMPUTER
APPLICATIONS, AHMEDABAD, GUJARAT





```

# Load the data
data <- read.csv("C:/Users/abhinav/Desktop - Education Centre of Australia/Desktop Data 04/14/2019/proprietor.csv", stringsAsFactors=TRUE)

# View the data
data

# Summary statistics
summary(data)

# Group by gender
data %>% group_by(Gender) %>% summarise(Average = mean(Age))

# Group by gender and payment method
data %>% group_by(Gender, Method.of.Payment) %>% summarise(Average = mean(Age))

```

```

# Group by gender and payment method
data %>% group_by(Method.of.Payment) %>% summarise(Total = sum(Age))

# Group by gender and payment method
data %>% group_by(Method.of.Payment) %>% summarise(Total = sum(Age))

# Group by gender and payment method
data %>% group_by(Method.of.Payment) %>% summarise(Total = sum(Age))

```

```

# Group by gender and payment method
data %>% group_by(Gender) %>% summarise(Average = mean(Age))

# Group by gender and payment method
data %>% group_by(Gender) %>% summarise(Average = mean(Age))

# Group by gender and payment method
data %>% group_by(Gender) %>% summarise(Average = mean(Age))

```



FDP
Topic :Data Visualization with Shiny R

Presenter : Dr. Jonita Roman
ITM (SLS), Baroda University,
Vadodara

All UI functions are simply HTML wrappers

```

print(ui)

## <div class="container-fluid">
## <h2>BC Store prices</h2>
## <div class="row">
## <div class="col-sm-4">
## <form class="well">our inputs will go here</form>
## </div>
## <div class="col-sm-8">the results will go here</div>
## </div>
## </div>

```

```

library(shiny)
ui <- fluidPage(
  titlePanel("BC Store prices"),
  fluidRow(
    column(4,
      formTextInput("input", "Enter price"),
      submitButton("Submit")
    ),
    column(8,
      textOutput("results")
    )
  )
)

server <- function(input, output) {
  observeEvent(input$submit, {
    price <- as.numeric(input$input)
    output$results <- price
  })
}

```

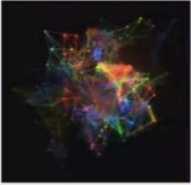



Going Steady the Data Science Way



Date: 25th March 2022 Dr. Nidhi Arora

Data Science Case Studies with R and Python



Date: 25th March 2022 Dr. Nidhi Arora



Date: 26th March 2022 Dr. Nidhi Arora



Positive Impact of National Education Policy On Education System

Dr. Pankaj Patel
Professor & Director,
Graduate School of Management Studies
Gujarat Technological University

Vision of NEP-2020

- An education system rooted in Indian ethos that contributes directly to transforming India, that is Bharat, sustainably into an equitable and vibrant knowledge society, by providing high-quality education to all, and thereby making India a global knowledge superpower.
- The curriculum and pedagogy of our institutions must develop a deep sense of respect towards the fundamental duties and Constitutional values, bonding with one's country, and a conscious awareness of one's roles and responsibilities in a changing world.
- To instill a deep-rooted pride in being Indian, not only in thought, but also in spirit, intellect, and deeds, as well as to develop knowledge, skills, values, and dispositions that support responsible commitment to human rights, sustainable development and living, and global well-being, thereby reflecting a truly global citizen.

First Phase (Short term plan) : 1 to 3 years

Priority	Implementable Points	Implementation
8	Capacity Building of Teachers <ul style="list-style-type: none"> • Teachers of HEIs and University to be trained for implementation of NEP 2020 • Annual Appraisal of teachers on academic, research and social commitment parameters • Faculty to attend 200 hours of training before joining as a teacher 	IIT, Gandhigram for teachers from non-technical HEIs and by IIT Gandhigram for teachers from technical HEIs and University Concerned HEI and University
9	Amendment to University Act on Governance	State Government
10	Multiple Entry & Exit System <ul style="list-style-type: none"> • UG and PG programmes to be restructured with consistent certificates/ diploma and degree components on exit. • Identify credit requirements to earn certificates/ diploma / degree at the time of exit. • Development of similar evaluation system across universities so that 	Concerned University Concerned University All universities as a group