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Unveiling The Virtual Classroom: An In-Depth Analysis of The Online Education System

Online classes and technology have emerged as a superhero during the lockdown days. We have all been under house arrest but are still connected with the world of education. Due to the lockdown, students have not been able to stay connected with the outer world and the lack of exposure is evident. The only reprieve for the students' mental well-being has been the transition to online classes. Teachers made sure that the learning for students was not compromised, so they took a great leap forward to find solutions and create new learning environments for their students to ensure that learning never stops. With the rapid advancements in technology and the widespread availability of internet access, online education has gained significant popularity in recent years.

This project aims to delve deep into the various aspects of online education, examining its strengths, weaknesses, opportunities, and challenges. The outcomes of this project will provide valuable insights for educational institutions, policymakers, and online learning platforms to enhance the effectiveness and accessibility of online education. This analysis of the online education system aims to contribute to the ongoing dialogue on the future of education and help shape a more inclusive, engaging, and effective learning environment in the digital age.

Project Flow:

To accomplish this, we have to complete all the activities listed below,

1. **Define Problem / Problem Understanding**
    a. **Specify the business problem**

How can educational institutions and online learning platforms optimize the delivery of online education to ensure that it effectively addresses the mental well-being and holistic development of students, while also addressing the potential challenges and limitations of the online learning environment, especially in the post-lockdown era?

    b. **Business requirements**

- Determining the business requirements based on the inputs and feedbacks from students and teachers about the online education through surveys
- Updating the content
- Creating necessary arrangements for e-learning to both students and teachers with the help of online education platforms
- Specific requirements may vary depending on the student demographic, their needs and their interests

c. Literature Survey

EdTech:

Educational technology (edtech) has become an integral part of modern education, revolutionizing the way students learn and teachers instruct. This literature review provides insights into the role of edtech in contemporary education, highlighting its benefits, challenges, and implications for educators, students, and policymakers.

Benefits of Edtech in Education

- Enhanced Engagement (Kebritchi et al., 2017)
- Personalized Learning (Baker, 2017)
- Accessibility (Tondeur et al., 2019)
- Data-Driven Decision-Making (Siemens & Gasevic, 2012)

Challenges and Concerns

- Technological Gaps: (Warschauer & Matuchniak, 2010)
- Privacy and Security: (Greenhow & Chapman, 2020)
- Digital Overload: (Twenge & Campbell, 2018)
- Teacher Training: (Ertmer et al., 2012)

Implications for Policy and Practice:

- Professional Development (Kopcha et al., 2013)
- Equity and Access: (Penuel & Gallagher, 2017)
- Data Privacy Regulations: (Nasir & Kayworth, 2015)
- Research and Evaluation: (Means et al., 2013)

Students Behaviour towards Online Education:

Online education has become increasingly prevalent in recent years, and understanding student behavior in this context is crucial for educators, institutions, and policymakers. This literature review examines student behavior towards online education, including factors influencing participation, engagement, and outcomes.

Factors Influencing Student Behavior in Online Education

- Access and Technology Proficiency (Means et al., 2013)
- Motivation and Self-Discipline (Artino, 2008)
- Course Design and Structure(Anderson, 2008)
- Social Interaction (Rovai, 2002)

Student Engagement and Participation

- Active Participation (Fredricks et al., 2004)
- Communication (Lowenthal et al., 2019)
- Feedback (Garrison et al., 1999)
- Time Management (Fetzner, 2013)

Challenges and Barriers

- Isolation and Loneliness (Richardson et al., 2017)
- Technical Issues (Johnson et al., 2018)
- Lack of Accountability (Kizilcec et al., 2020)
- Digital Distractions (Junco et al., 2011)

d. **Social or Business Impact.**

The outcomes of this project will provide valuable insights for educational institutions, policymakers, and online learning platforms to enhance the effectiveness and accessibility of online education. This analysis of the online education system aims to contribute to the ongoing dialogue on the future of education and help shape a more inclusive, engaging, and effective learning environment in the digital age.

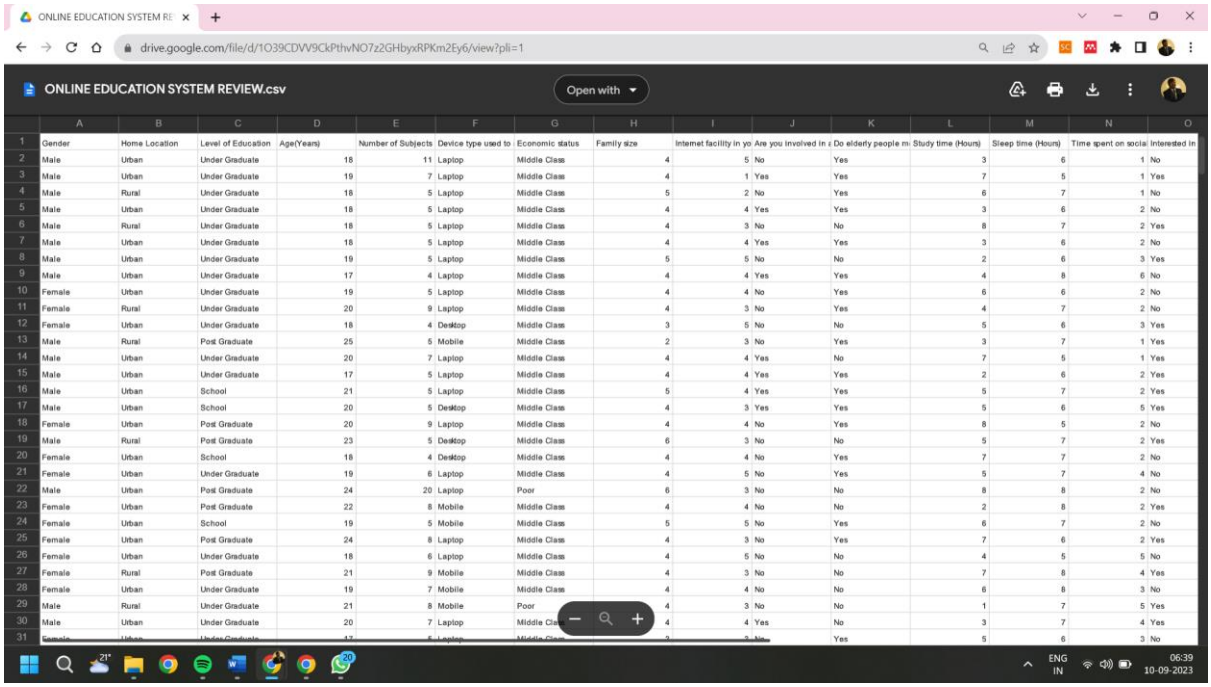
2. Data Collection

a. Collect the dataset

Data has been collected from the link https://drive.google.com/file/d/1O39CDVV9CkPthvNO7z2GHbyxRPKm2Ey6/view?pli=1

Data Set Name: Online Education System Review

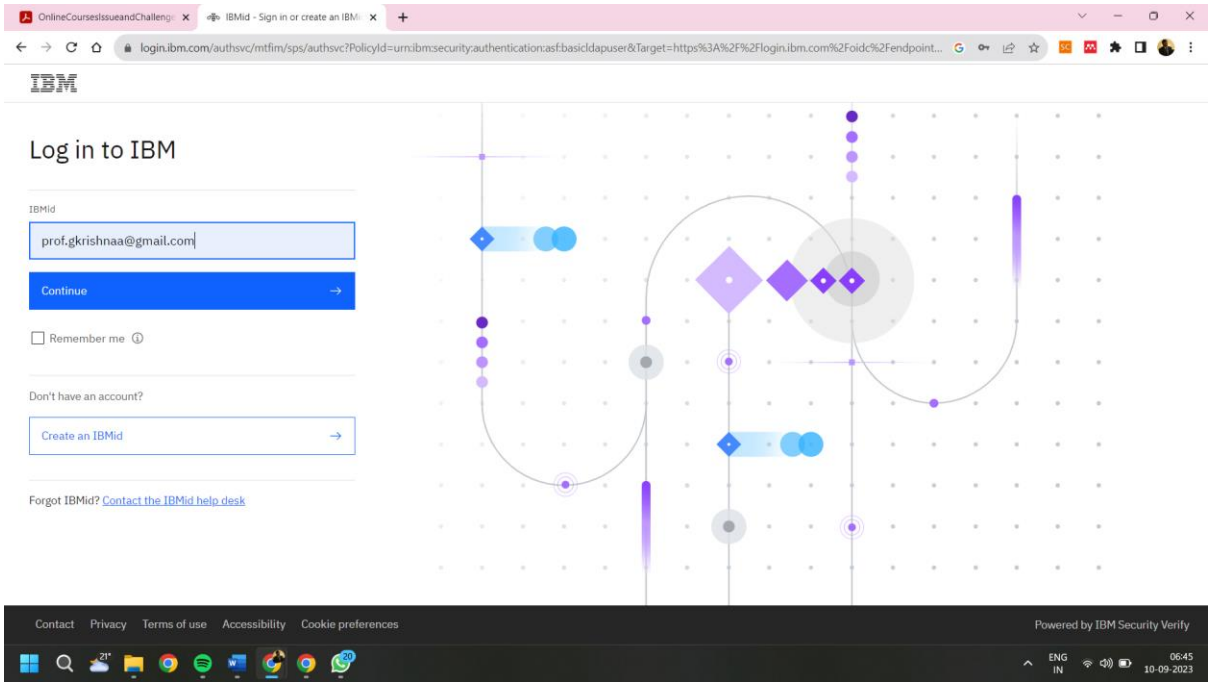
File Type: .csv



Then performed **Activity 1.1: Understand the data** through various fields / columns description online education system review.

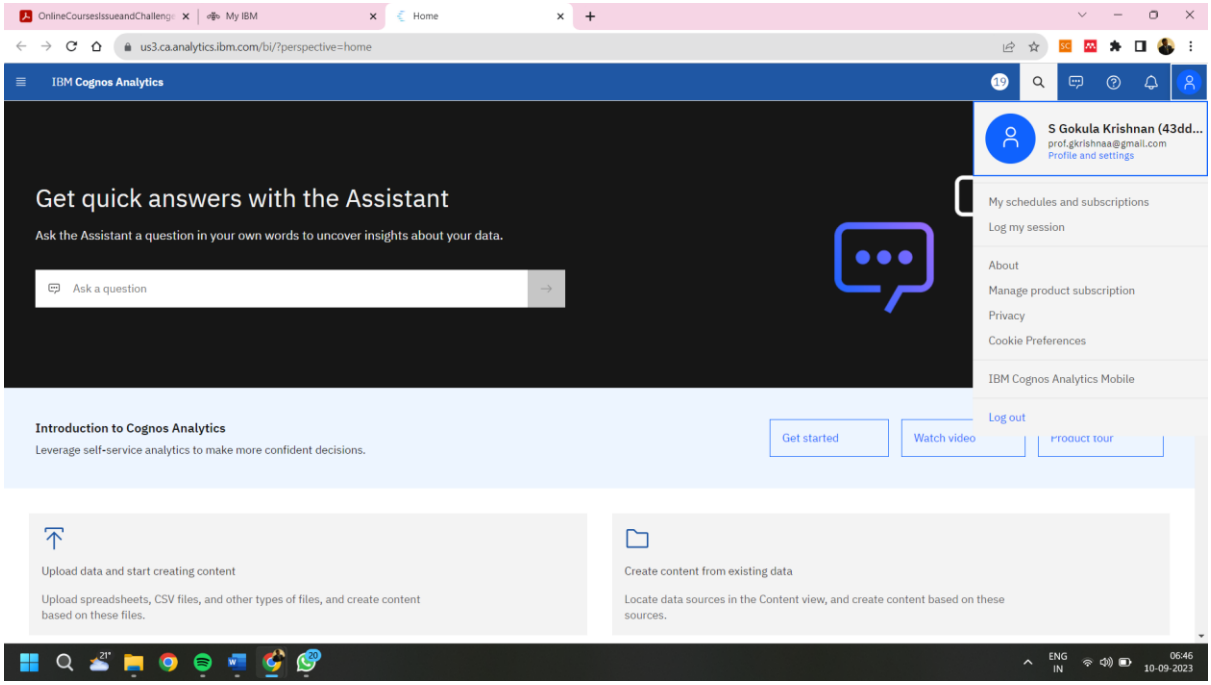
b. **Connect data with IBM cognos**

Next, I have logged in to

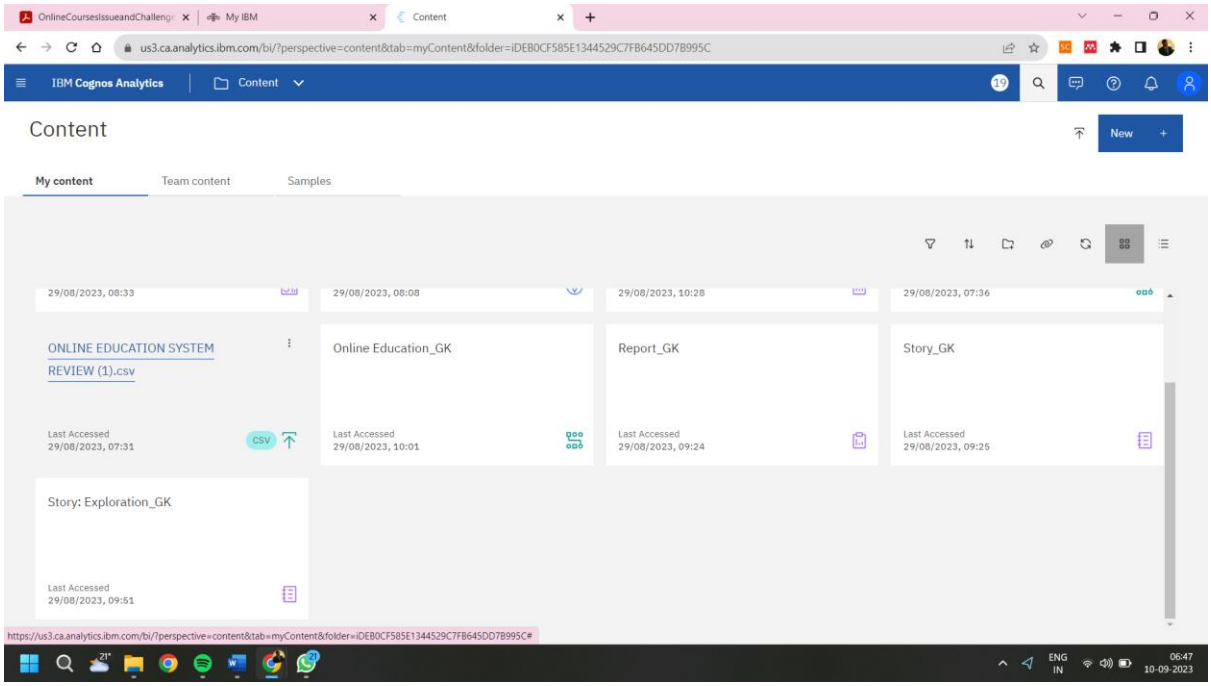


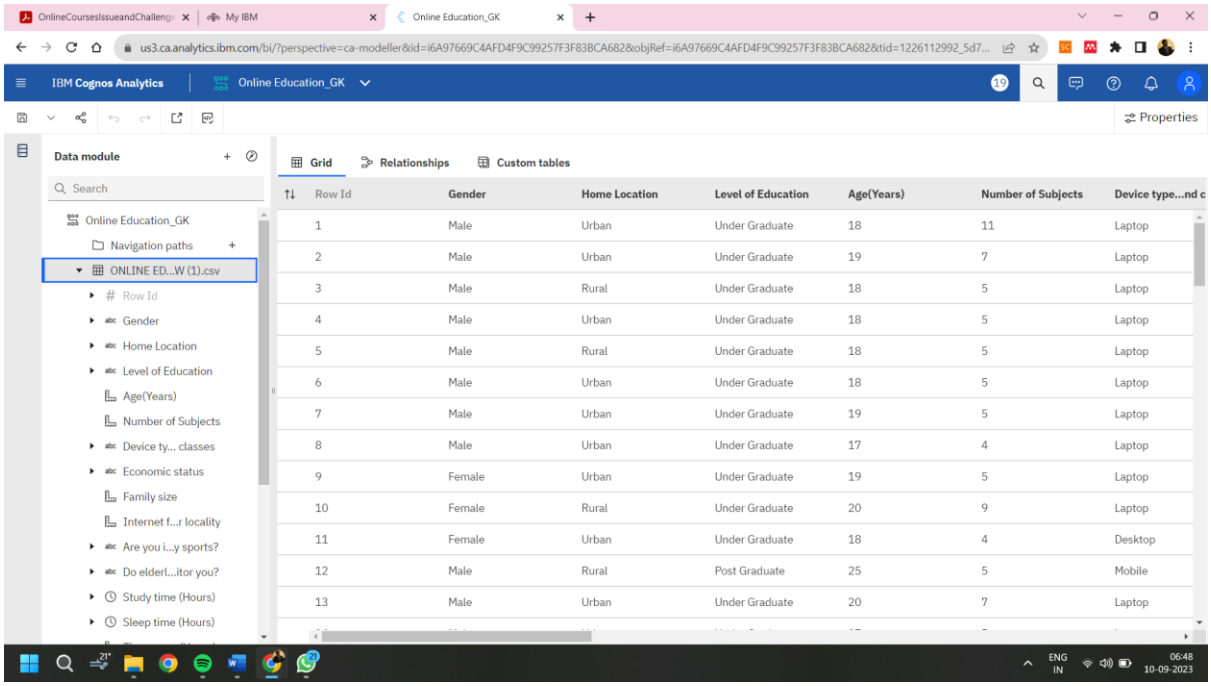
https://myibm.ibm.com/dashboard/

https://us1.ca.analytics.ibm.com/bi/?sbsSubscriptionID=510411939



Uploaded the Data



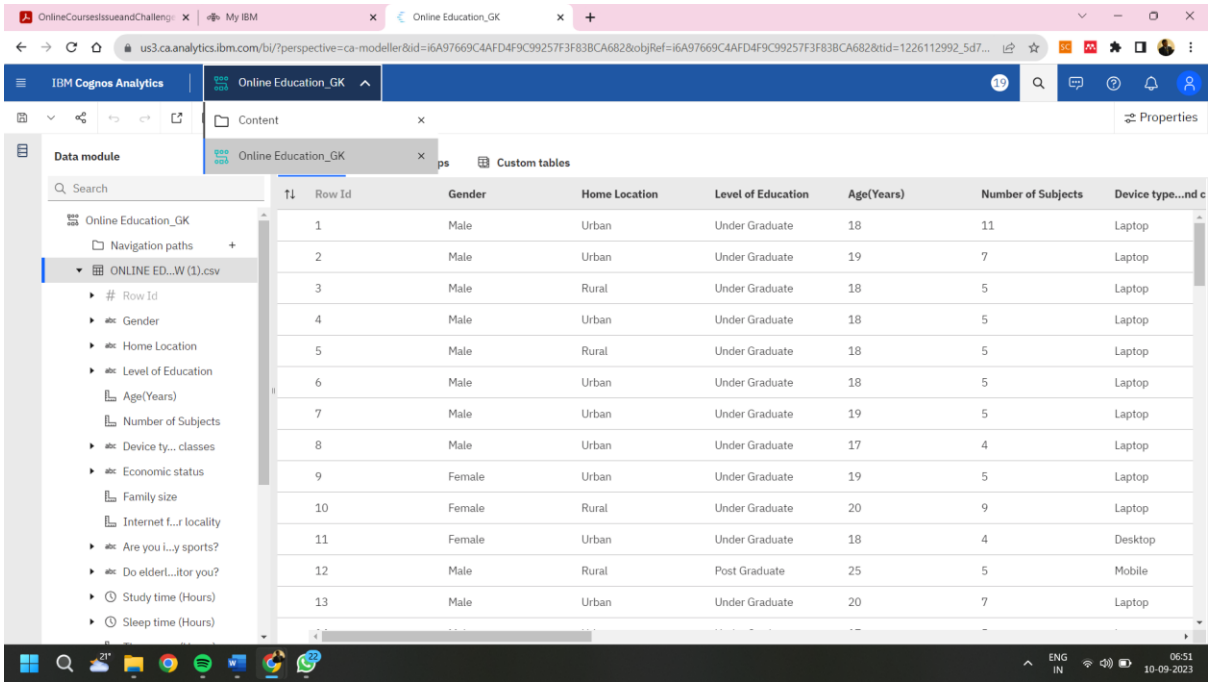


Row Id	Gender	Home Location	Level of Education	Age(Years)	Number of Subjects	Device type...nd c
1	Male	Urban	Under Graduate	18	11	Laptop
2	Male	Urban	Under Graduate	19	7	Laptop
3	Male	Rural	Under Graduate	18	5	Laptop
4	Male	Urban	Under Graduate	18	5	Laptop
5	Male	Rural	Under Graduate	18	5	Laptop
6	Male	Urban	Under Graduate	18	5	Laptop
7	Male	Urban	Under Graduate	19	5	Laptop
8	Male	Urban	Under Graduate	17	4	Laptop
9	Female	Urban	Under Graduate	19	5	Laptop
10	Female	Rural	Under Graduate	20	9	Laptop
11	Female	Urban	Under Graduate	18	4	Desktop
12	Male	Rural	Post Graduate	25	5	Mobile
13	Male	Urban	Under Graduate	20	7	Laptop

3. Data Preparation

a. Prepare the Data for Visualization

https://us3.ca.analytics.ibm.com/bi/?perspective=ca-modeller&pathRef=.my_folders%2FOnline%2BEducation_GK



- Data set has been renamed
- Aggregation function was carried out “count distinct”

Data set is ready for the further analysis.

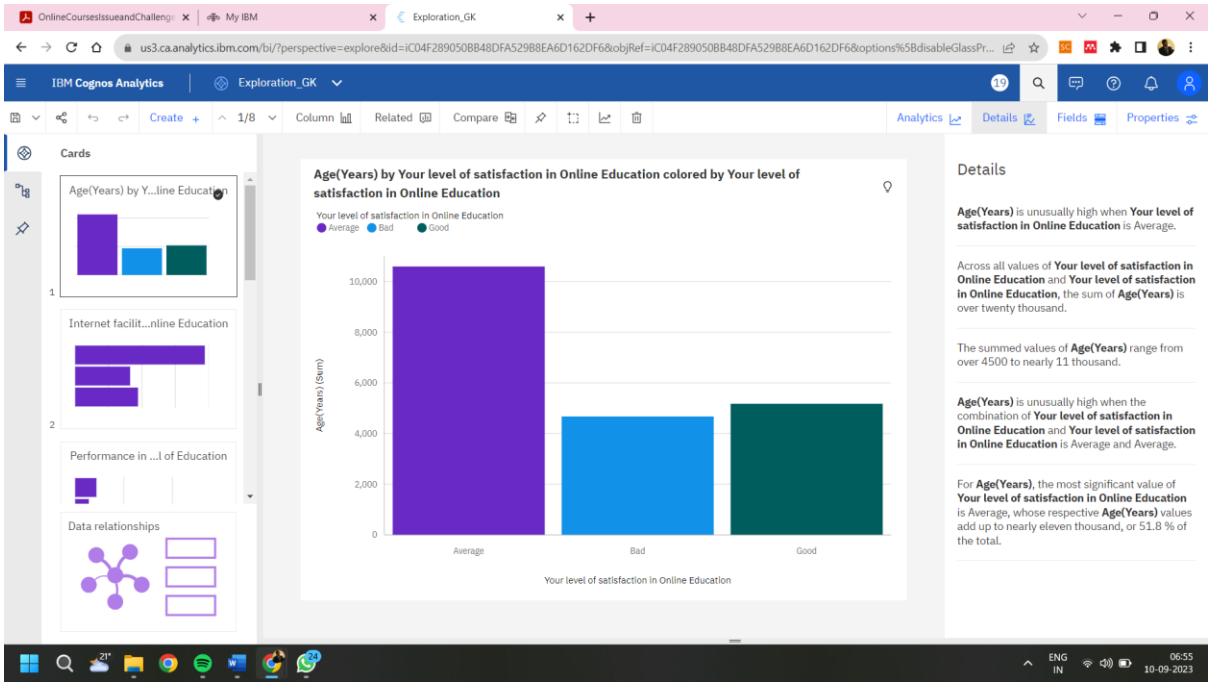
4. Data Visualizations

a. No of Unique Visualizations

https://us3.ca.analytics.ibm.com/bi/?perspective=explore&pathRef=.my_folders%2FExploration_GK&subView=model0000018a4155bf17_00000004

Embedded Code:

<iframe src="https://us3.ca.analytics.ibm.com/bi/?perspective=explore&pathRef=.my_folders%2FExploration_GK&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&subView=model0000018a4155bf17_00000004" width="320" height="200" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>



- Totally 8 unique visualizations / charts have been created using exploration function and same has been pinned
    - Activity 1.1: Column Chart
    - Activity 1.2:Bar Chart
    - Activity 1.3: Bar chart
    - Activity 1.4: Pie Chart
    - Activity 1.5: Packed Bubble
    - Activity 1.6: Word Cloud
    - Activity 1.7:Table
    - Activity 1.8: Radial Chart
- Embedded link was copied using share option
- All charts were copied and pasted in word document and then it has been converted to pdf document

5. Dashboard

a. Responsive and Design of Dashboard

https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FDashboard_GK&action=view&mode=dashboard&subView=model0000018a416d2aa800000000

Embedded Code:

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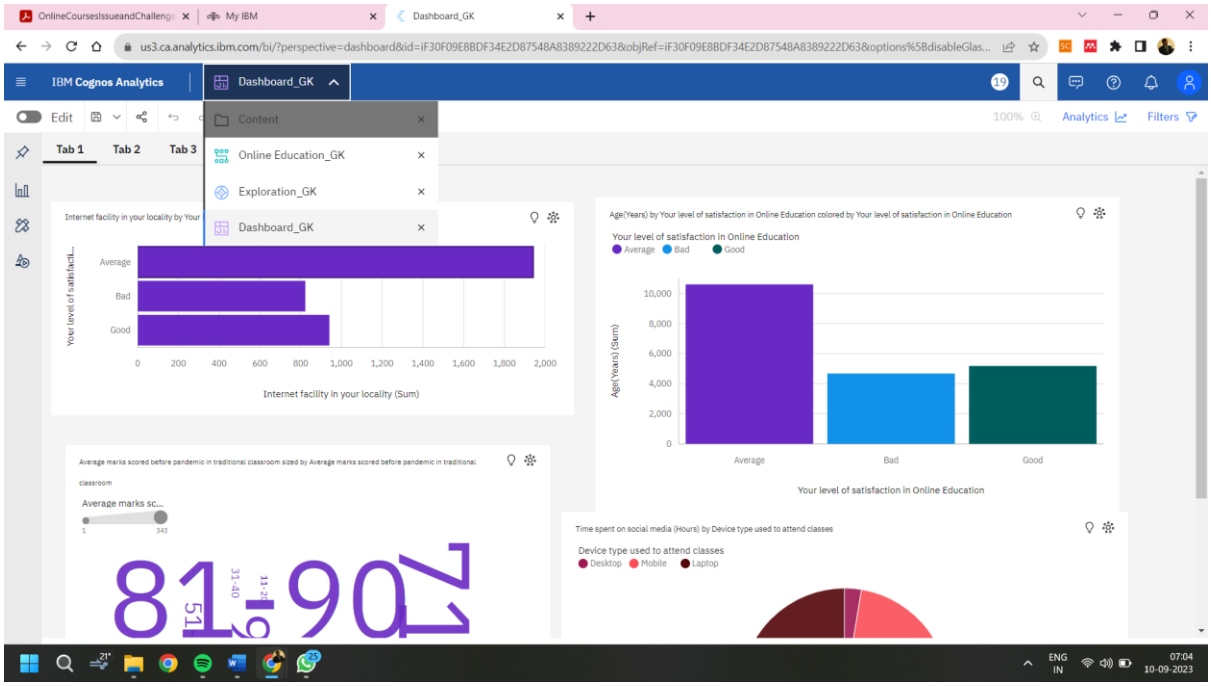
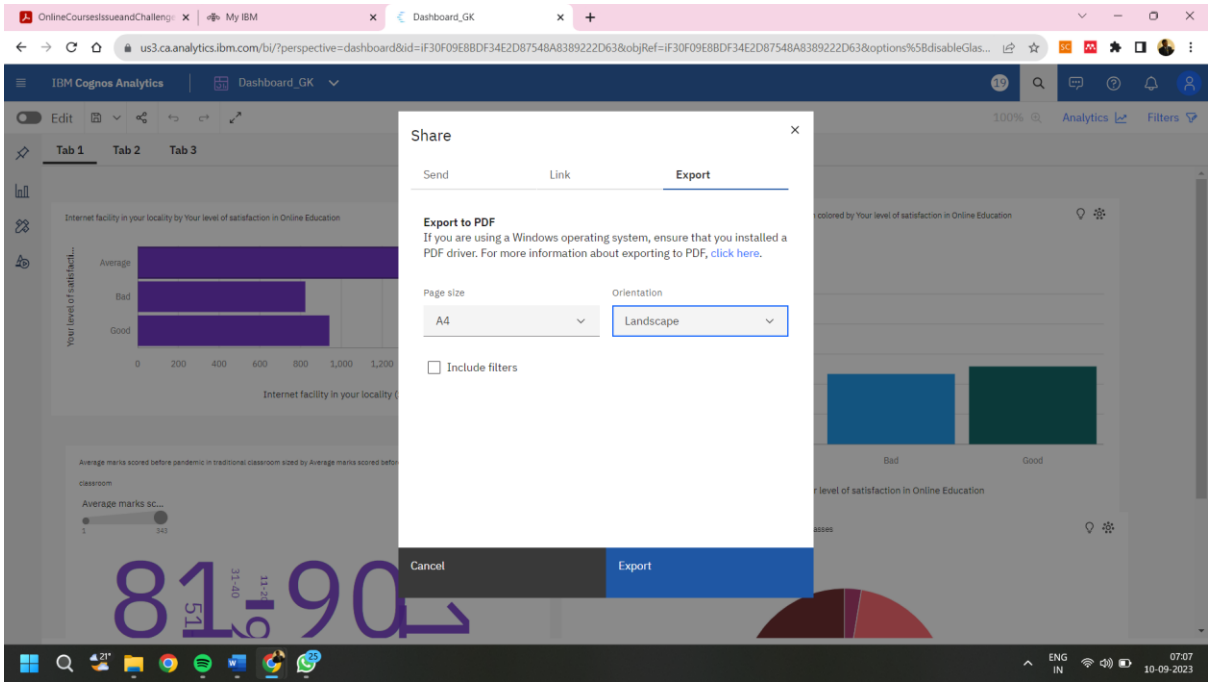
ubView=model0000018a416d2aa8_00000000" width="320" height="200" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>



- 3 different tabs in dashboards created using the pinned visualizations from activities 1.1 to 1.8
- Link and embedded codes were copied using share option
- All 3 tabs in dashboards were exported to pdf using share option and saved in the folder
- Then next step is to create a story based on dashboards

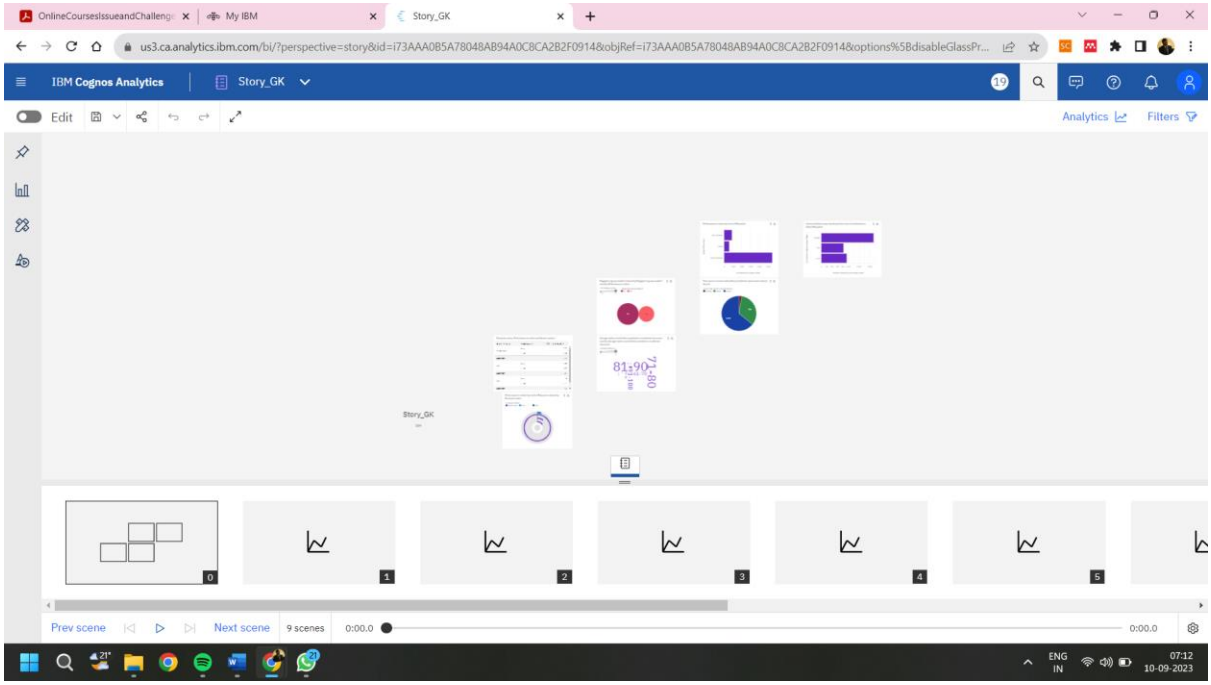


6. **Story**
    a. No of Scenes of Story

https://us3.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FStory_GK&action=view&sceneId=-1&sceneTime=0

Embedded Code:

<iframe src="https://us3.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FStory_GK&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&sceneId=-1&sceneTime=0" width="320" height="200" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>



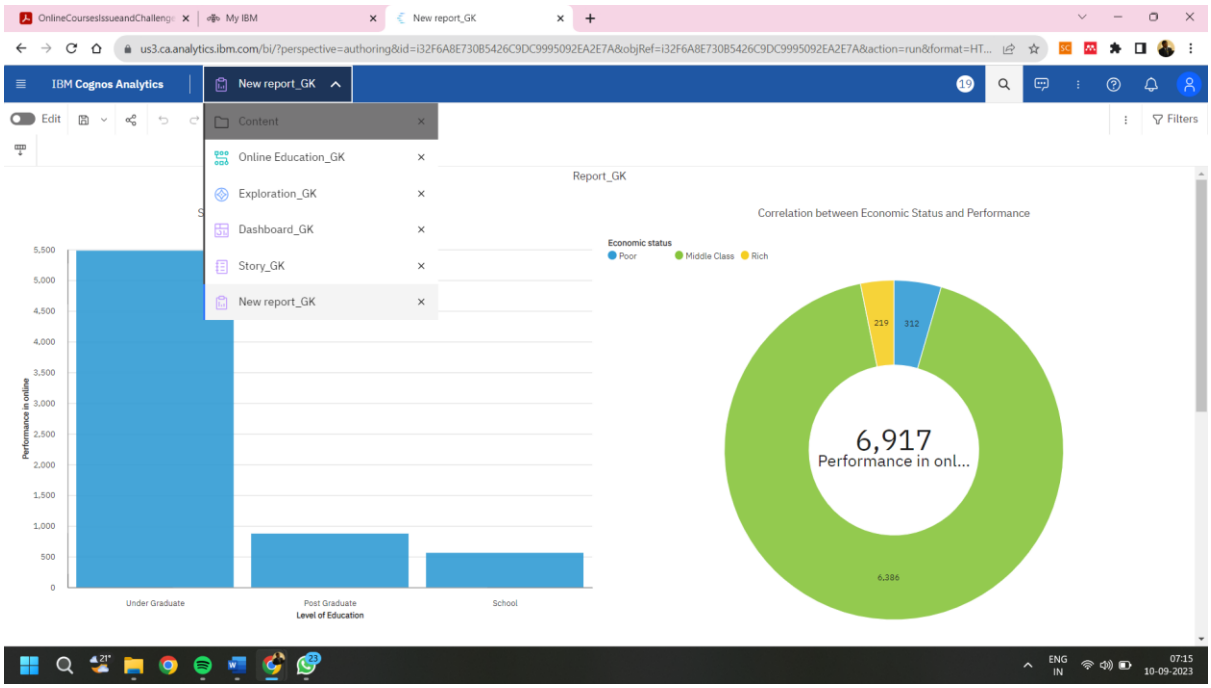
- Story was created using 8 scenes
- Link and embedded codes were copied using share option
- All 8 scenes of story were exported to pdf using share option and saved in the folder

7. **Report**
    a. Creating a report

https://us3.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FNew%2Breport_GK&action=run&format=HTML&prompt=false

Embedded Code:

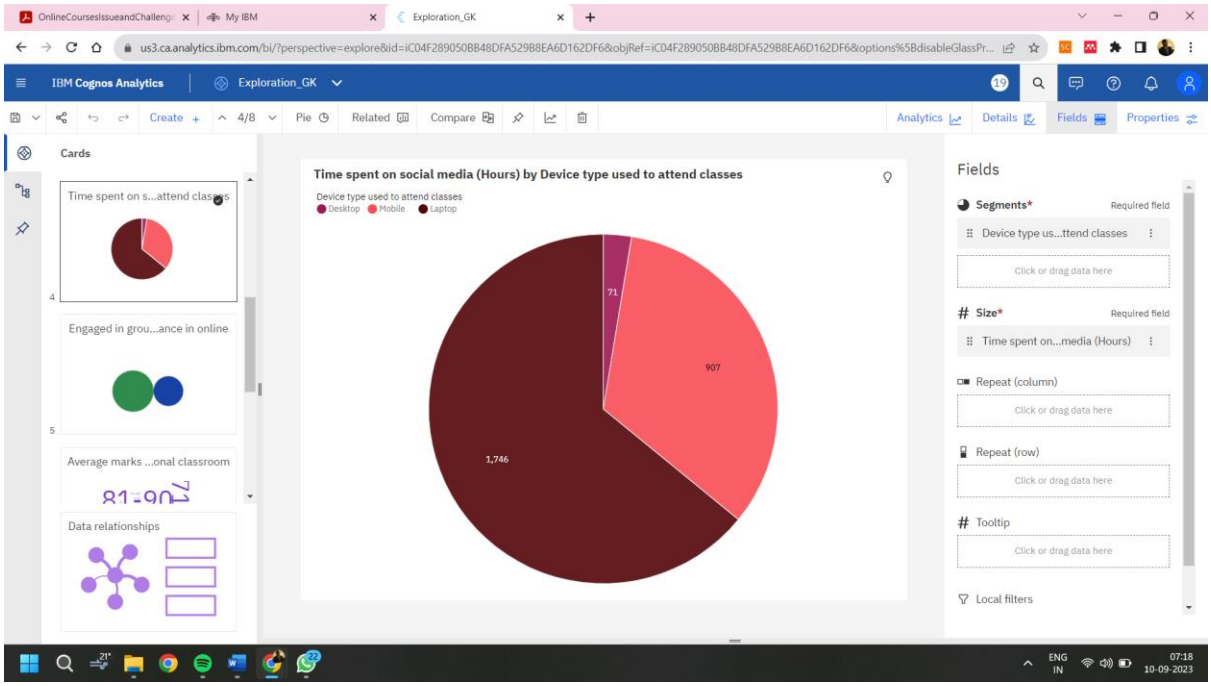
<iframe src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FNew%2Breport_GK&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=run&format=HTML&prompt=false" width="320" height="200" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

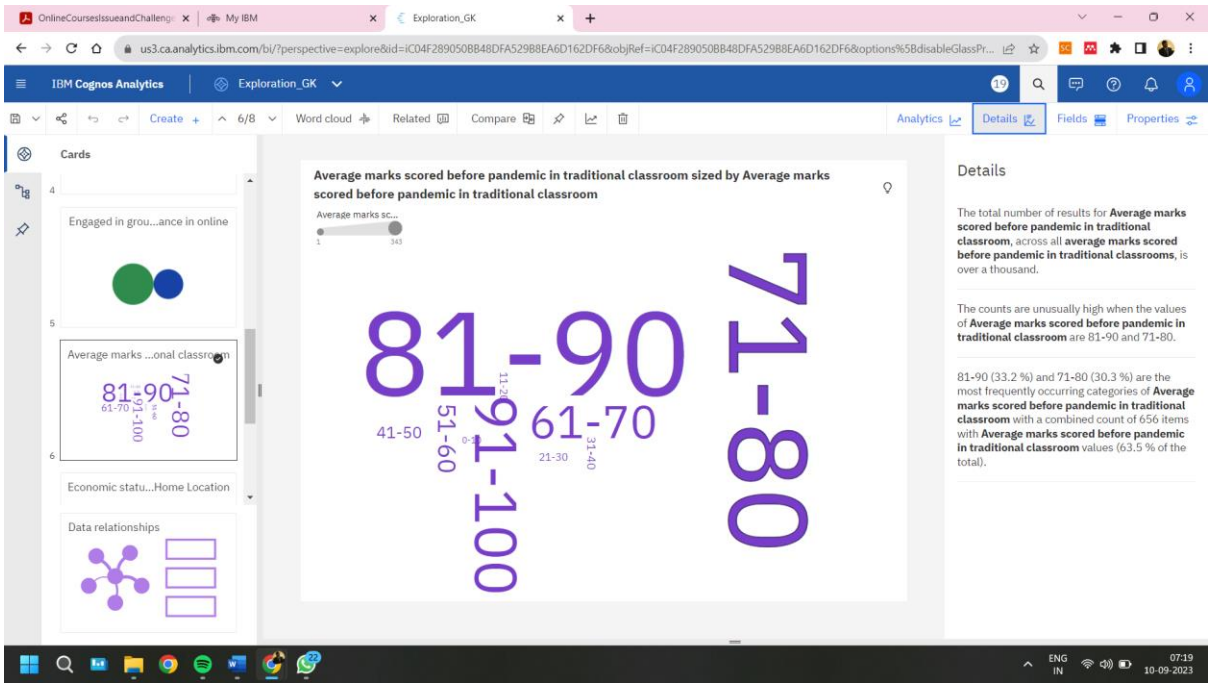


- There are 4 different stories were created to create Report using various fields from the data set.
- Link and embedded codes were copied using share option
- Report was exported to pdf using share option and saved in the folder

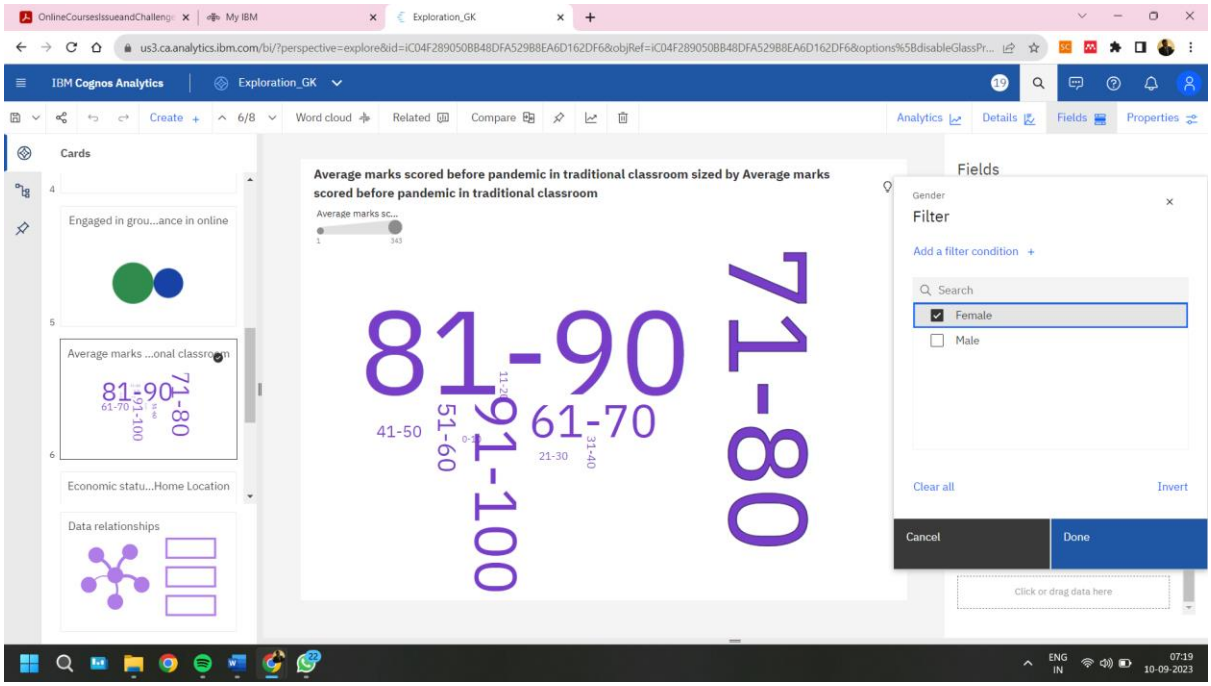
8. Performance Testing

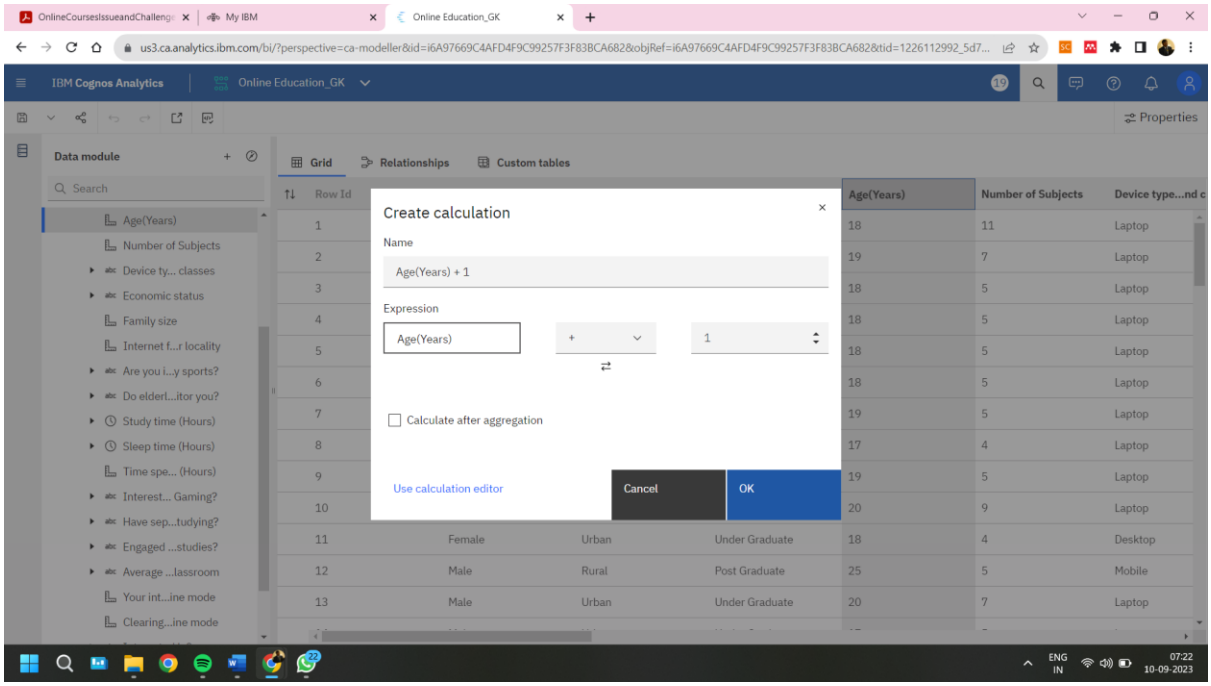
a. Amount of Data Rendered to DB ‘
b. Utilization of Data Filters
c. No of Calculation Fields
d. No of Visualizations/ Graphs


IBM Cognos Analytics
Exploration_GK
Create
4/8
Pie
Related
Compare
Analytics
Details
Fields
Properties
Cards
Time spent on s...attend classes
Engaged in grou...ance in online
Average marks ...onal classroom
Data relationships
Time spent on social media (Hours) by Device type used to attend classes
Device type used to attend classes
Desktop
Mobile
Laptop
71
907
1,746
Fields
Segments*
Required field
Device type us...ttend classes
Click or drag data here
Size*
Time spent on...media (Hours)
Repeat (column)
Repeat (row)
Tooltip
Local filters


IBM Cognos Analytics
Exploration_GK
Create
6/8
Word cloud
Related
Compare
Analytics
Details
Fields
Properties
Cards
Engaged in grou...ance in online
Average marks ...onal classroom
Economic statu...Home Location
Data relationships
Average marks scored before pandemic in traditional classroom sized by Average marks scored before pandemic in traditional classroom
Average marks sc...
81-90
71-80
61-70
41-50
51-60
91-100
21-30
31-40
Details
The total number of results for Average marks scored before pandemic in traditional classroom, across all average marks scored before pandemic in traditional classrooms, is over a thousand.
The counts are unusually high when the values of Average marks scored before pandemic in traditional classroom are 81-90 and 71-80.
81-90 (33.2 %) and 71-80 (30.3 %) are the most frequently occurring categories of Average marks scored before pandemic in traditional classroom with a combined count of 656 items with Average marks scored before pandemic in traditional classroom values (63.5 % of the total).

Filter



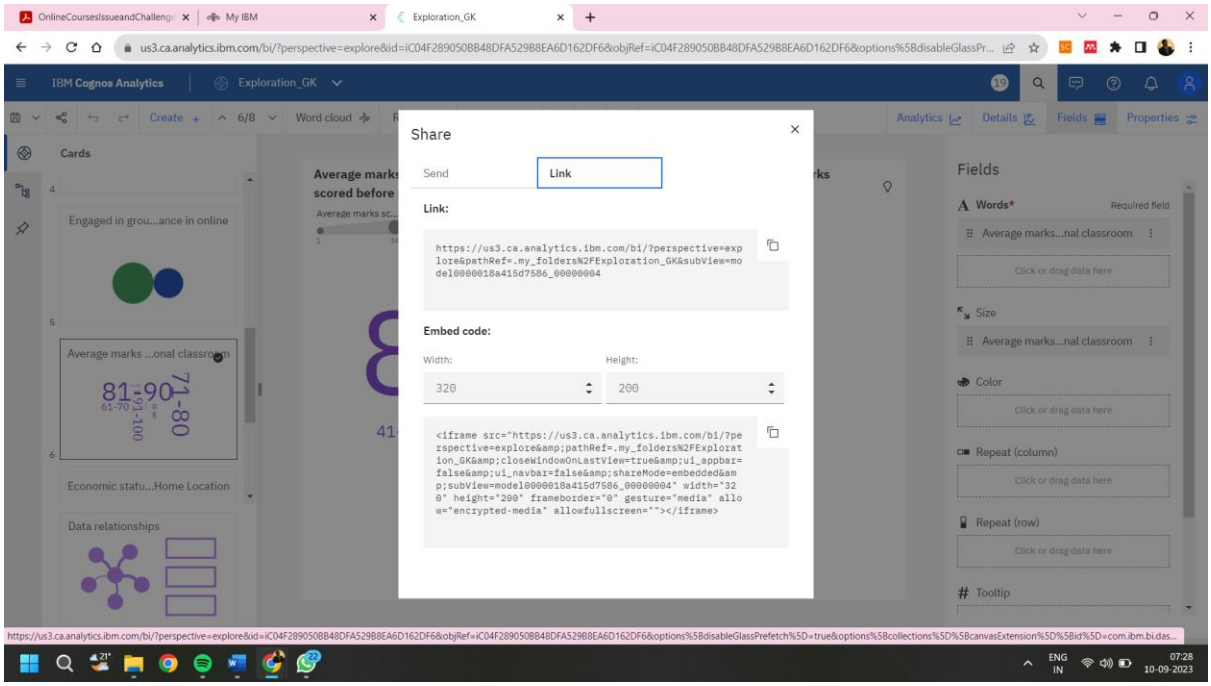


Performance Testing has been conducted.

9. Web Integration

a. Dashboard and Story embed with UI With Flask

Integrating dashboards/stories/reports to web



The Embed Code:

Exploration

<iframe src="https://us3.ca.analytics.ibm.com/bi/?perspective=explore&pathRef=.my_folders%2FExploration_GK&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&subView=model0000018a415d7586_00000004" width="320" height="200" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

Dashboard

<iframe src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FDashboard_GK&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&mode=dashboard&subView=model0000018a416d2aa8_00000000" width="320" height="200" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

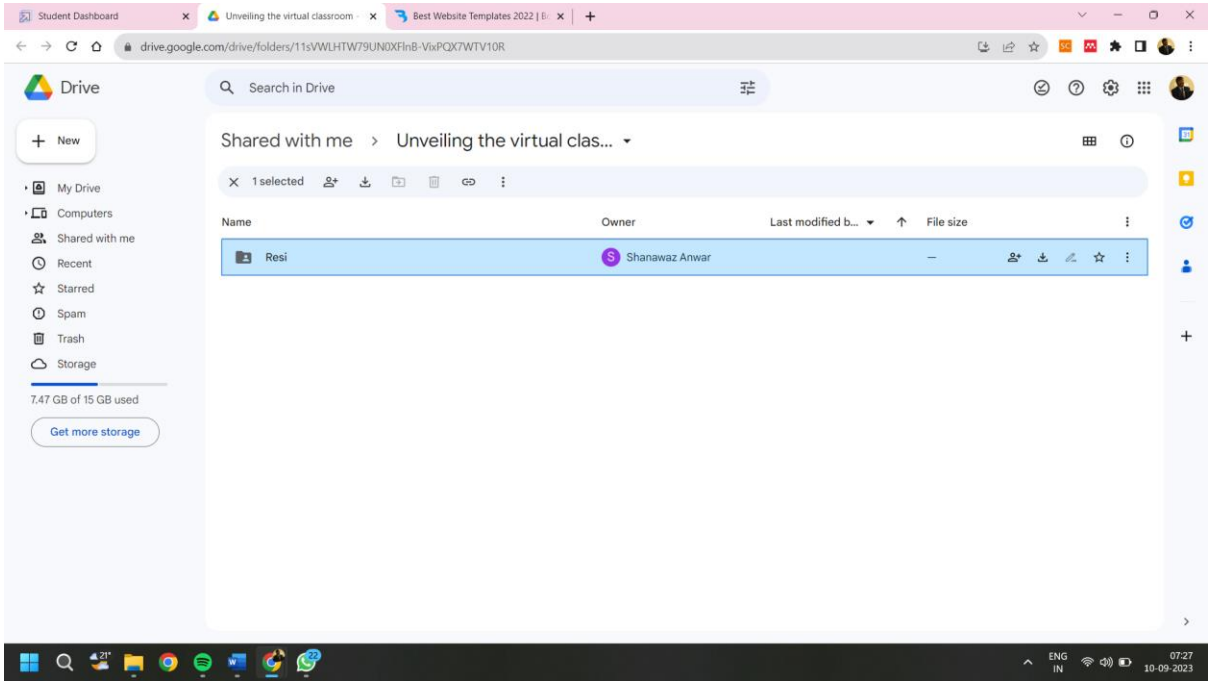
Story

<iframe src="https://us3.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FStory_GK&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&sceneId=model0000018a4189aff6_00000001&sceneTime=3100" width="320" height="200" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

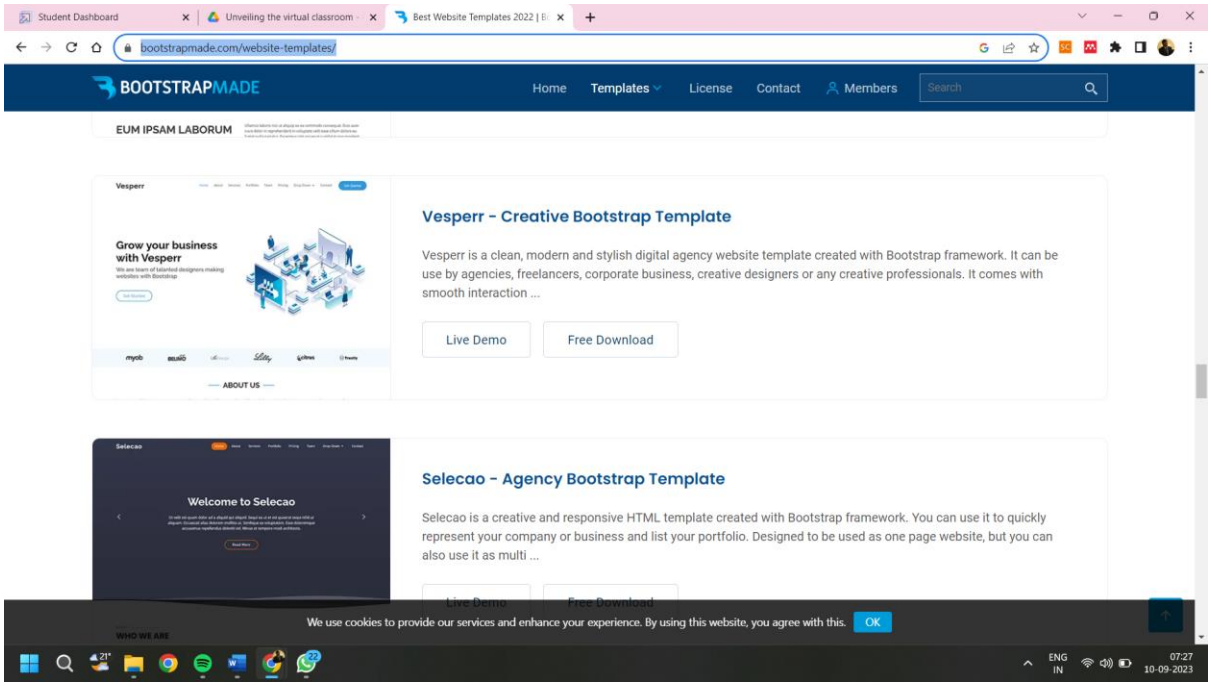
Report

<iframe src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FNew%2Breport_GK&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=run&format=HTML&prompt=false" width="320" height="200" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

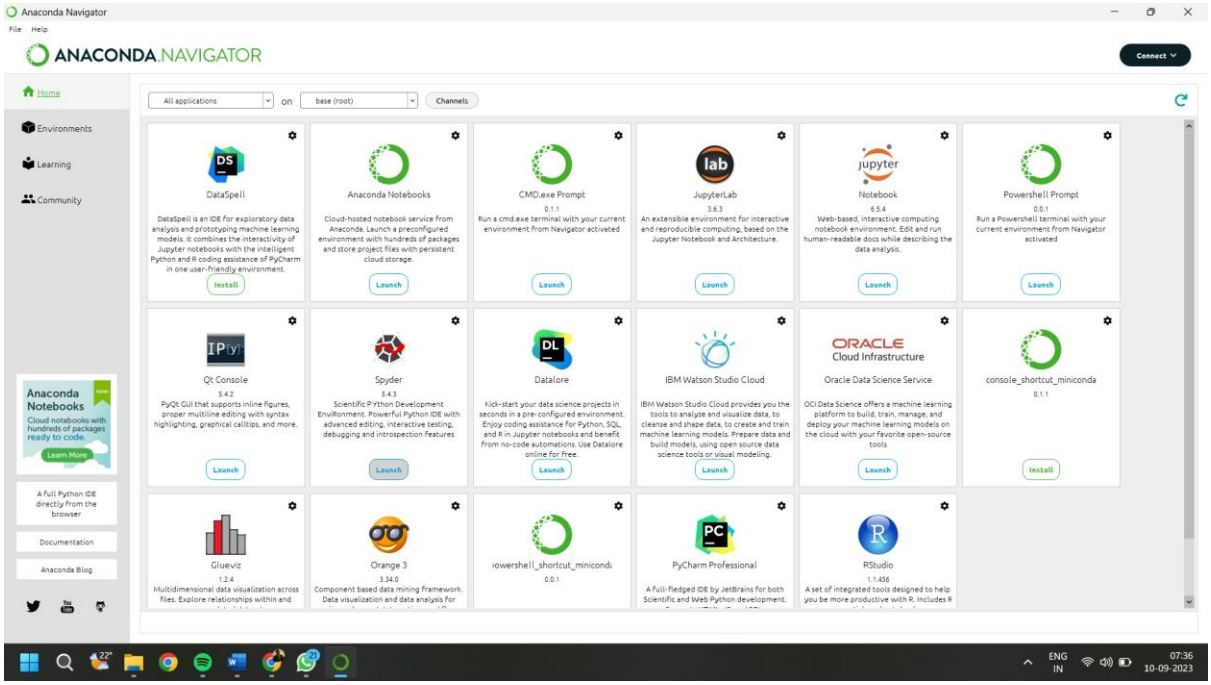
https://drive.google.com/drive/folders/11sVWLHTW79UN0XFlnB-VixPQX7WTV10R



https://bootstrapmade.com/website-templates/ using this link website template was decided

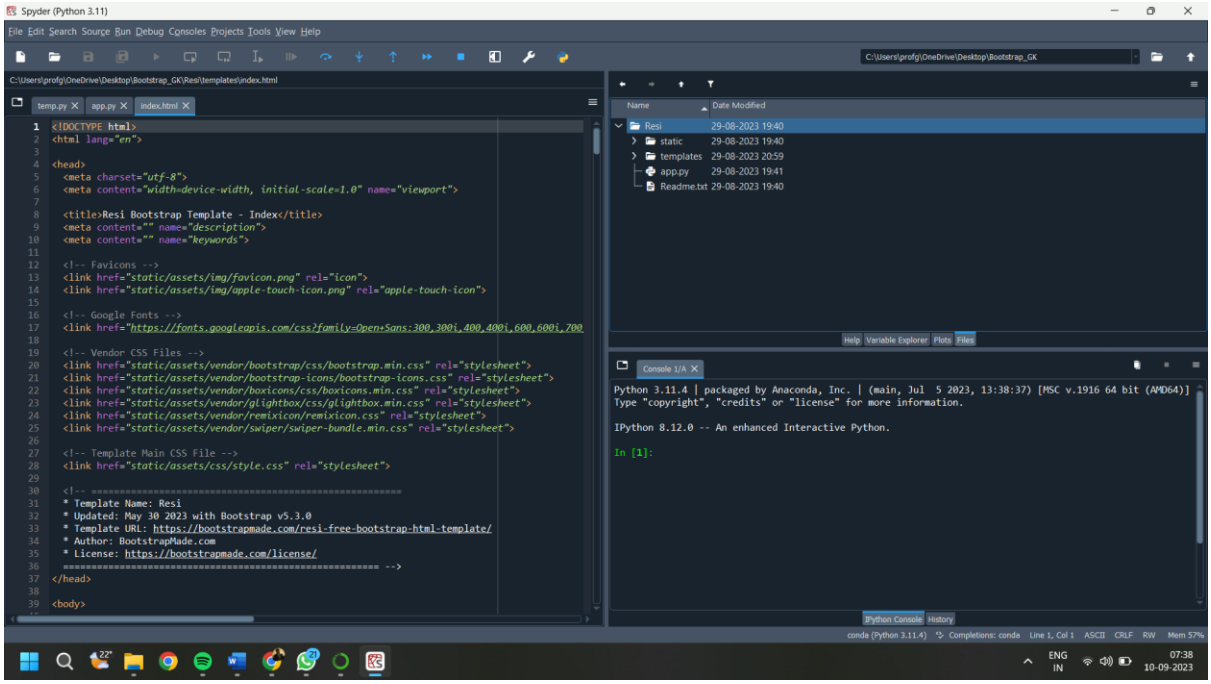


Then I used Python – Anaconda / Spyder for the web integration

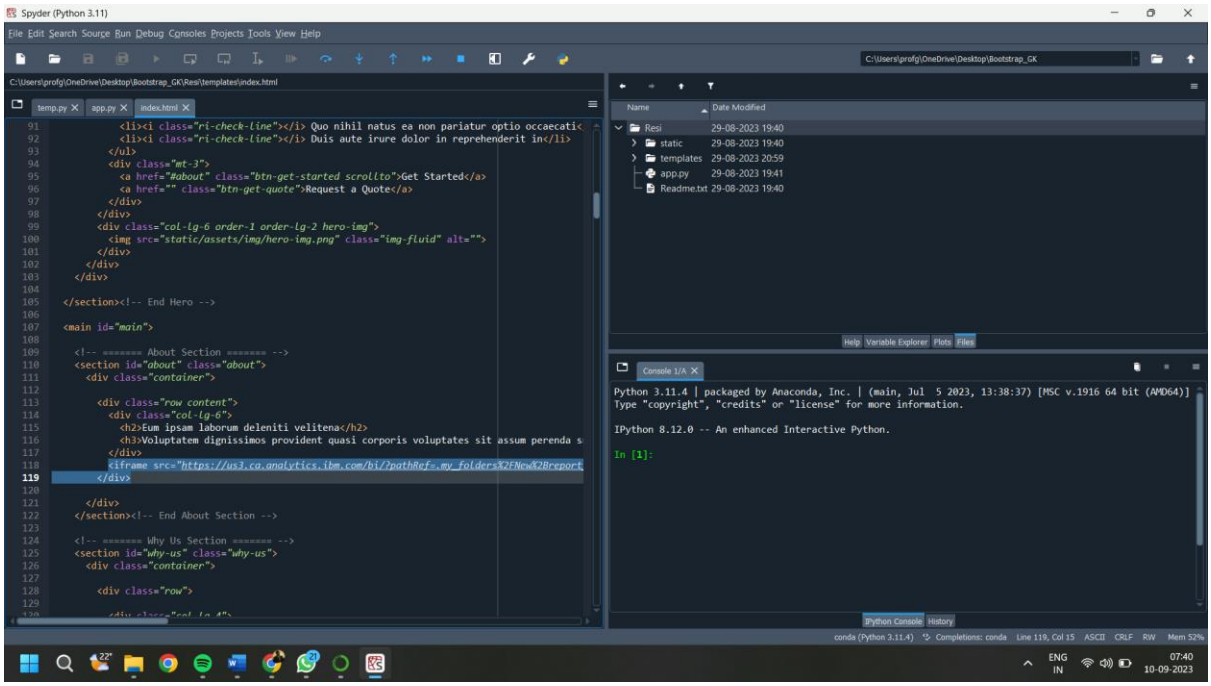


Imported the index.html file from resi folder from **Bootstrap Folder**

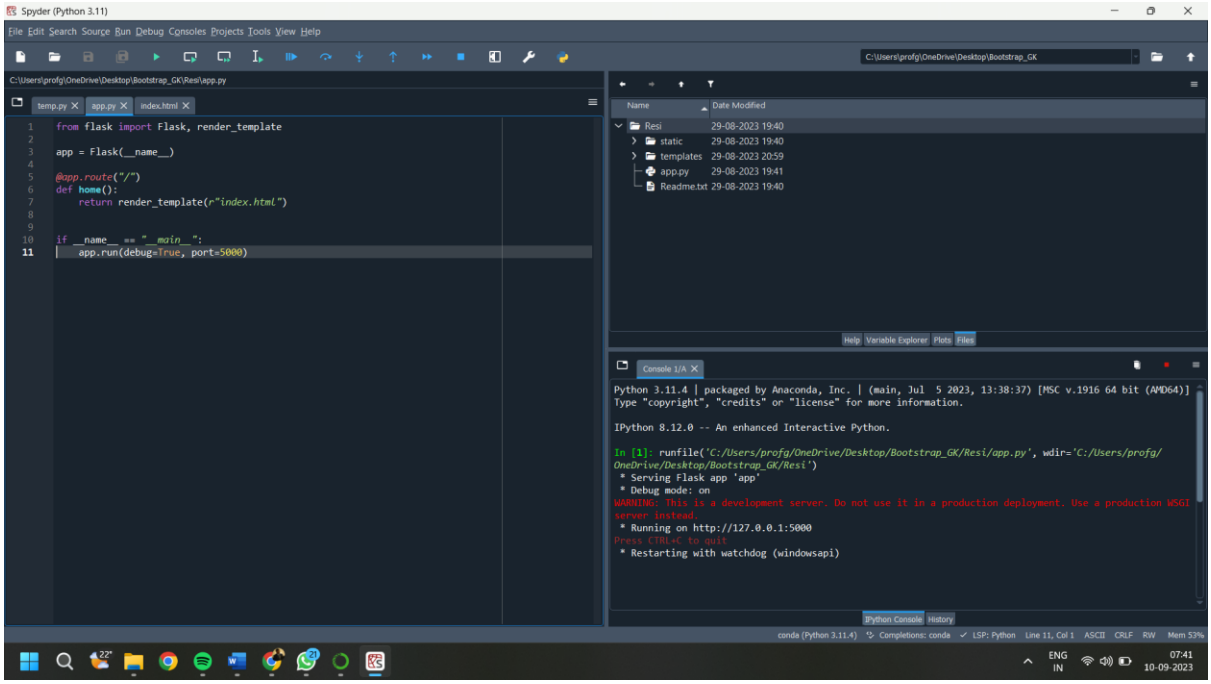
C:\Users\profg\OneDrive\Desktop\Bootstrap_GK



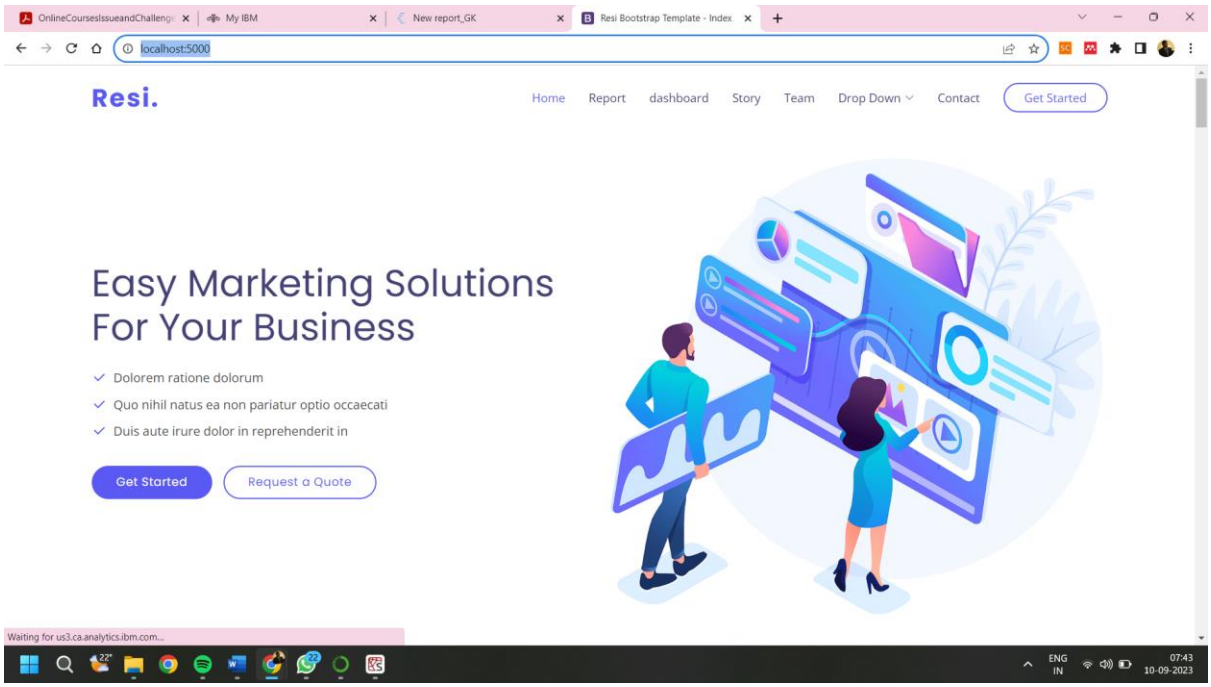
Then I have customized the header and sub contents by replacing the code in index.html file in spyder.

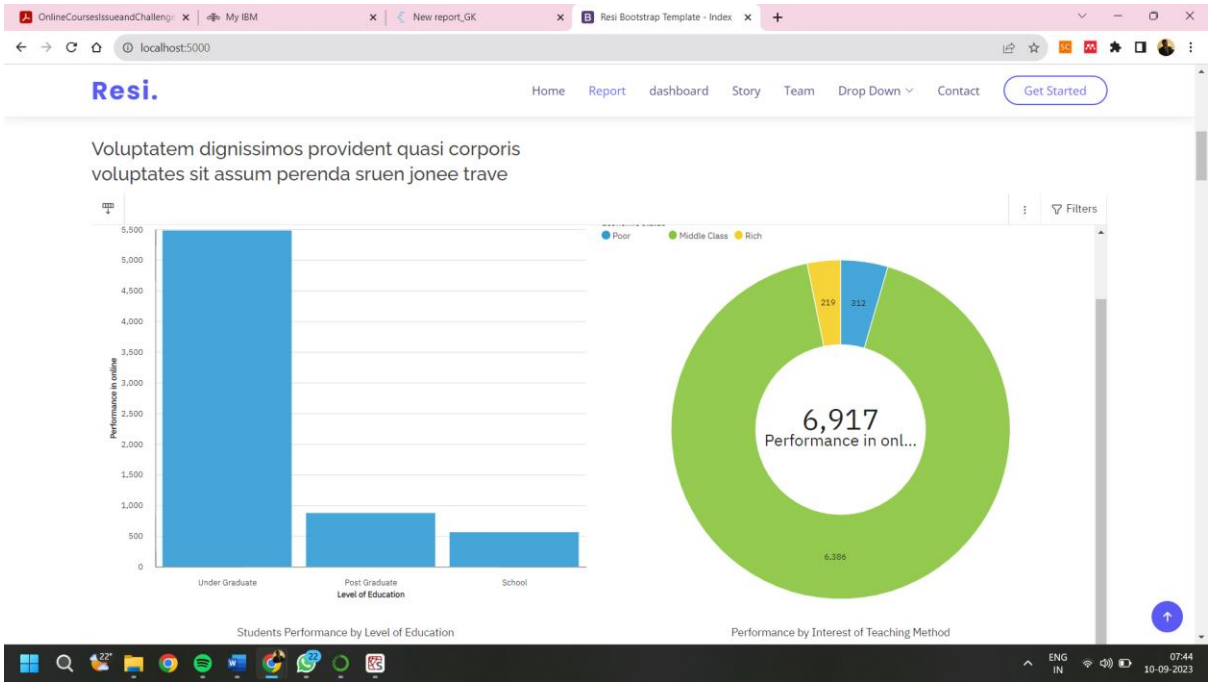


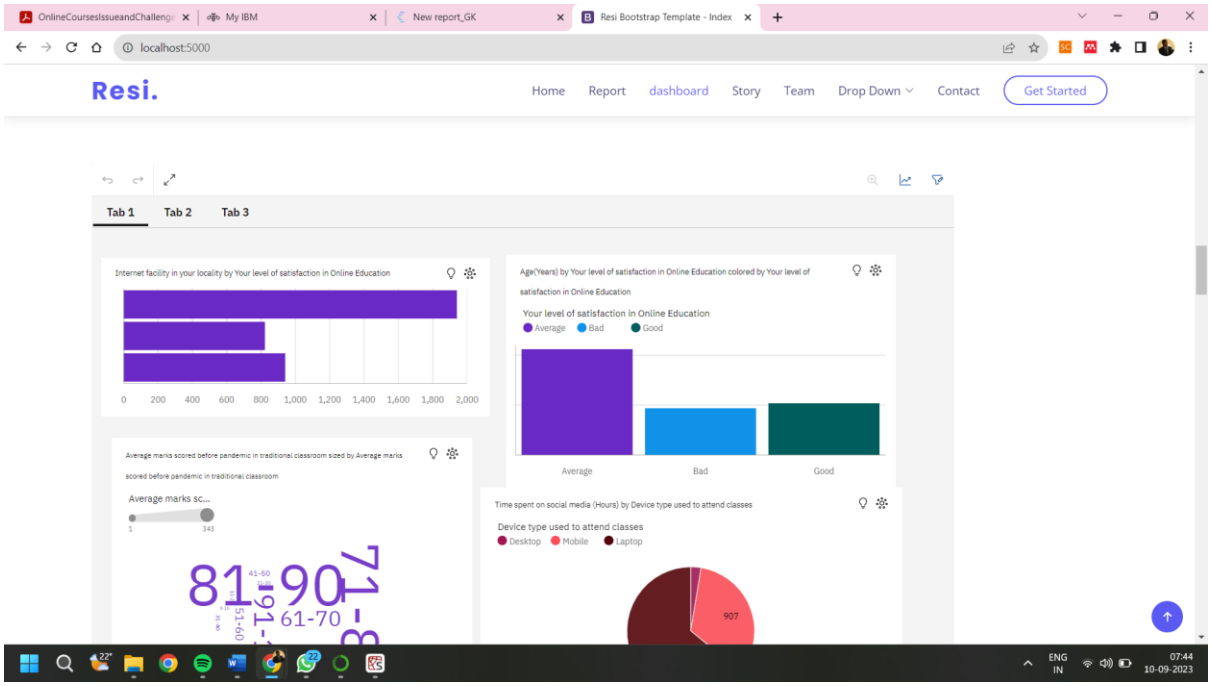
After that, done the necessary inputs in **app.py** and then **executed the run**

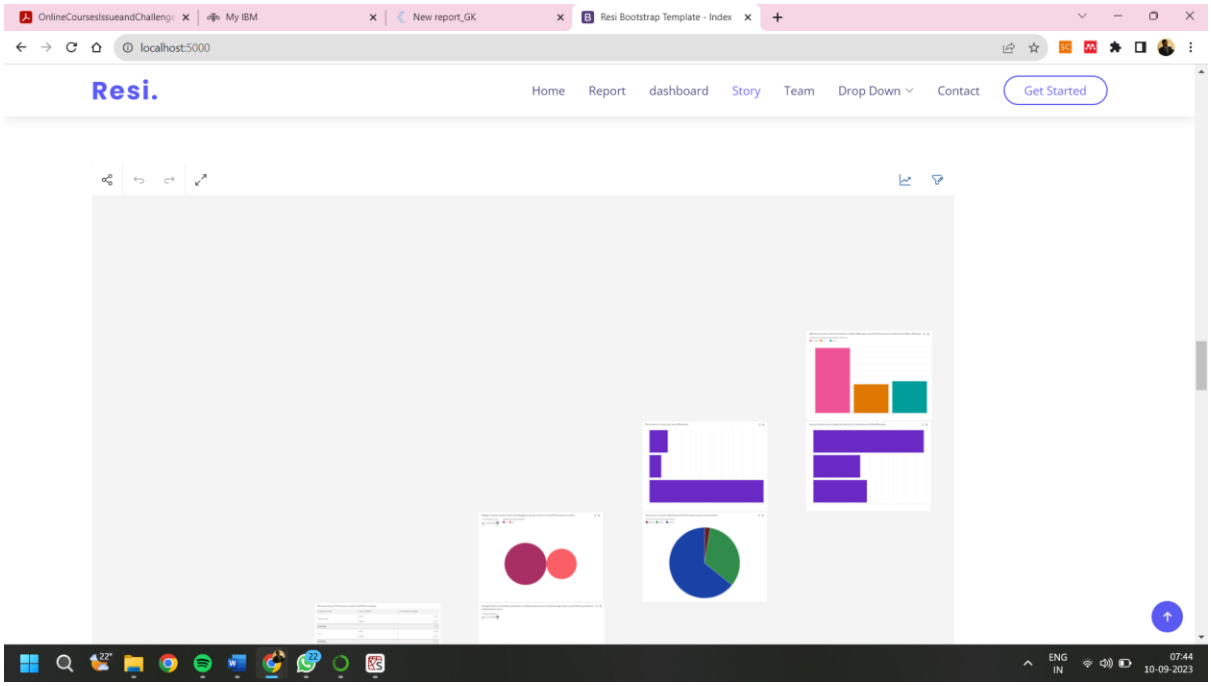


Next, opened google chrome and http://localhost:5000/




Resi.
Home
Report
dashboard
Story
Team
Drop Down
Contact
Get Started
Voluptatem dignissimos provident quasi corporis voluptates sit assum perenda sruen jonee trave
Filters
Performance in online
Under Graduate
Post Graduate
School
Level of Education
Students Performance by Level of Education
Poor
Middle Class
Rich
219
312
6,917
Performance in onl...
6,386
Performance by Interest of Teaching Method


Resi.
Home
Report
dashboard
Story
Team
Drop Down
Contact
Get Started
Tab 1
Tab 2
Tab 3
Internet facility in your locality by Your level of satisfaction in Online Education
Age(Years) by Your level of satisfaction in Online Education colored by Your level of satisfaction in Online Education
Your level of satisfaction in Online Education
Average
Bad
Good
Average marks scored before pandemic in traditional classroom sized by Average marks scored before pandemic in traditional classroom
Average marks sc...
Time spent on social media (Hours) by Device type used to attend classes
Device type used to attend classes
Desktop
Mobile
Laptop
907



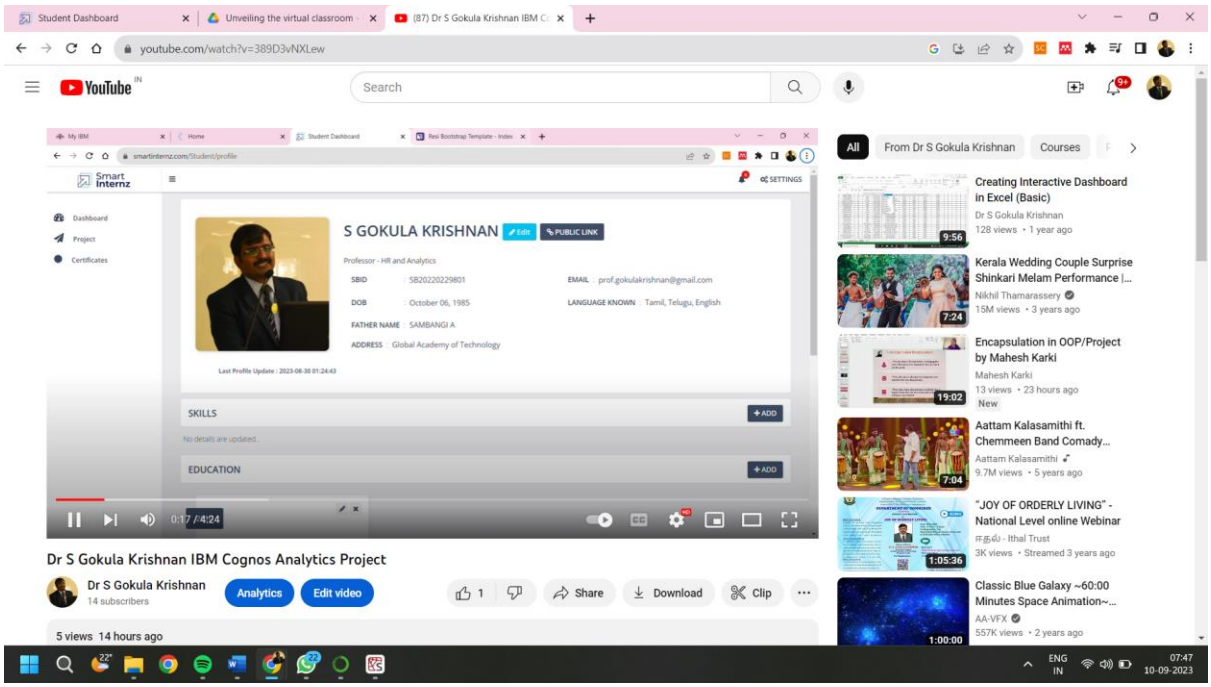
Successfully Integrated the web

10. Project Demonstration & Documentation

a. Record explanation Video for project end to end solution

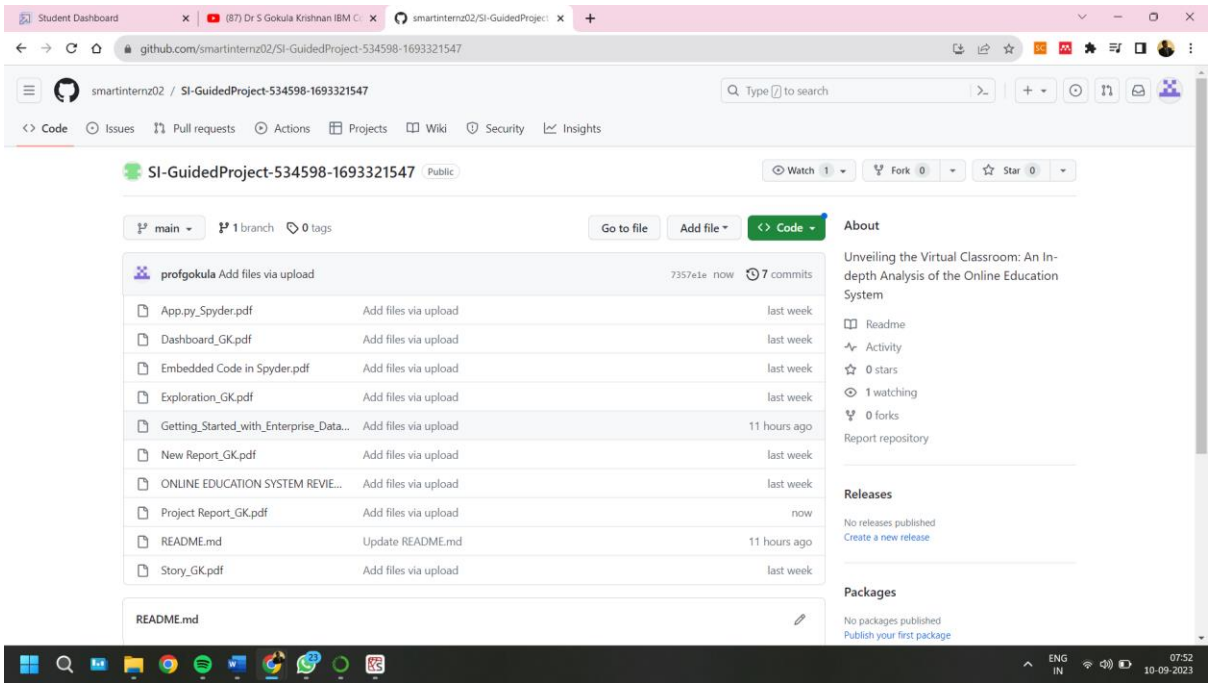
Demo Link Has been created for project end to end solution and link has been uploaded in you tube for public view

https://youtu.be/389D3vNXLew

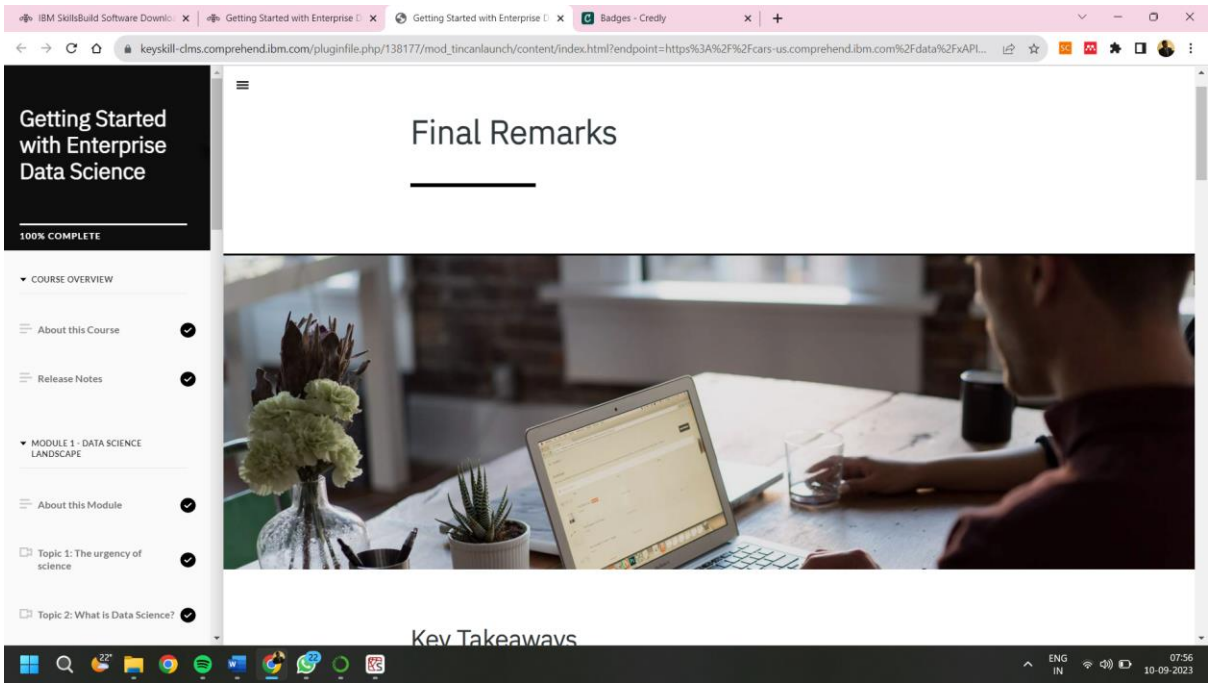


Next I have uploaded all the documents and required links to gitup link and collaborated with smartinternz

https://github.com/smartinternz02/SI-GuidedProject-534598-1693321547



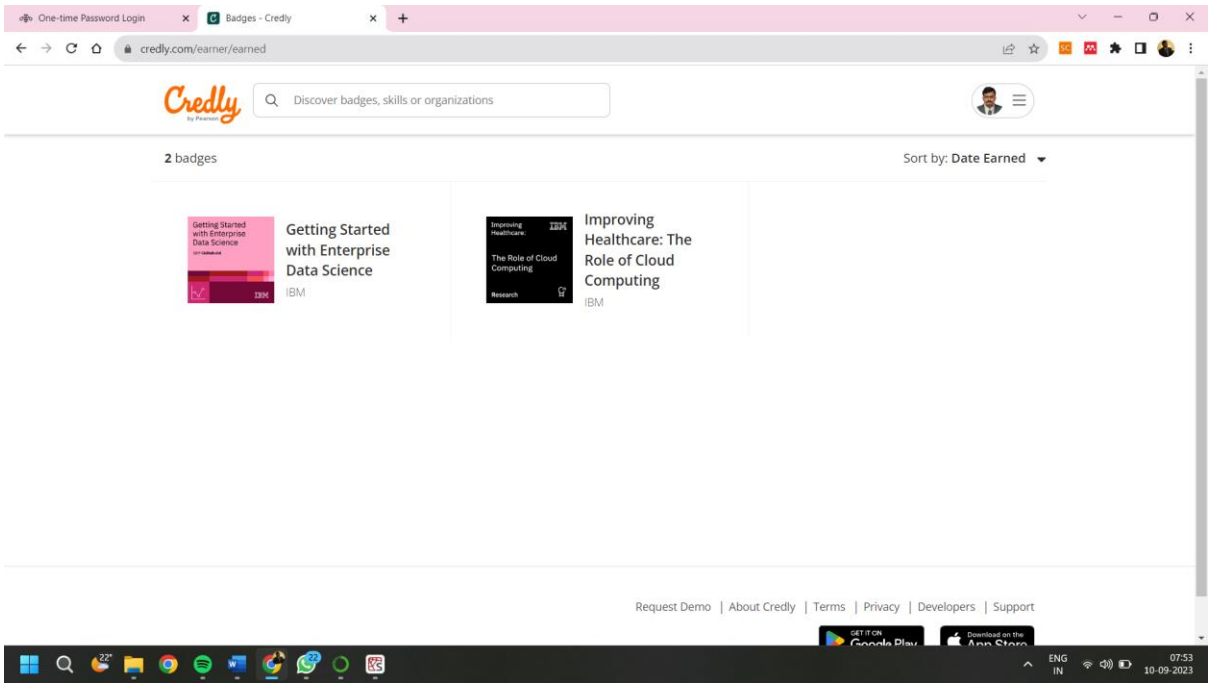
IBM Badges also attain and same has been uploaded in forms

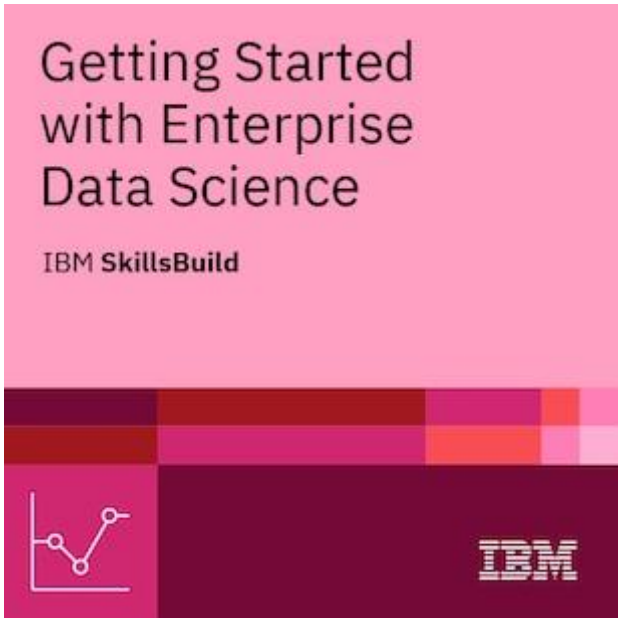


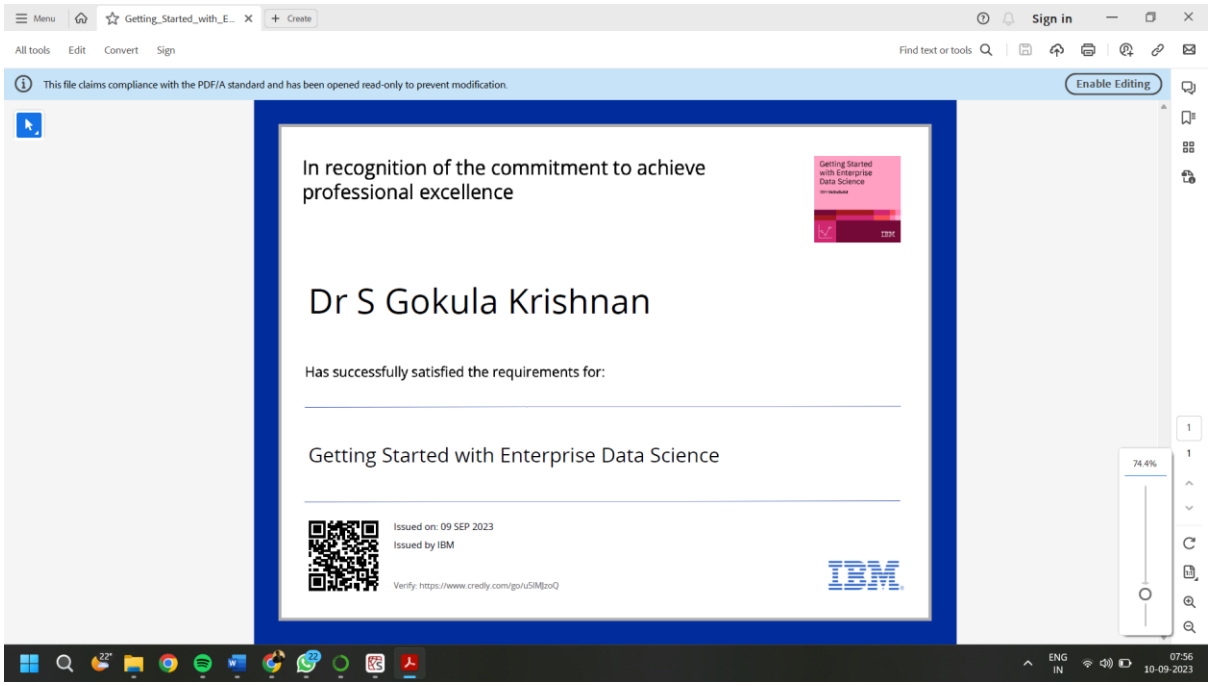
https://www.credly.com/badges/2aa9d535-ad73-4b65-9f52-447db4f9a73c/public_url

Code:

<script type="text/javascript" async src="//cdn.credly.com/assets/utilities/embed.js"></script>







b. Project Documentation-Step by step project development procedure

Complete report has been submitted to gitup.

Thank you for your support and guidance!

Happy Learning!

Dr S Gokula Krishnan

https://linktr.ee/profgokula

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