Final Project General Info (Please Read Carefully)

The final projects for this course will encompass the material covered over the past weeks. The project consists of two main parts: theoretical and practical.

Theoretical Part: You will work with provided articles, videos, and documentaries to establish the background of your project.

Practical Part: You will conduct a basic data analysis using the tools learned in the course. Note that the data provided may not always be directly related to the main topic but will complement your story.

Project Guidelines:

- **Team Composition:** Each team can have up to 5 members.(no exception!)
- **Presentation:** Each team will prepare a presentation lasting no more than 25 minutes.
    - All team members must participate in the presentation.
    - All team members should be familiar with every step of the project and be ready to answer questions from the lecturer.
- **Structure:**
    - Begin with the theoretical background.
    - Follow with data visualization that ties into the story.
- **Coding Requirements:** Use Python exclusively for data analysis.
    - To ensure everyone understands the coding part, avoid complex syntax and varied libraries.
    - Permitted libraries: pandas, numpy, matplotlib, seaborn, plotly (geopandas as an alternative for creating maps).
    - For a bonus, you can create a web app using Dash.
- **Documentation:** Ensure your notebooks are well-documented and clean, using headers, markdowns, etc.
- **Presentation Tools:** You may use any tool for the presentation, including PowerPoint, Google Sheets, Canva, Jupyter Notebook, or your Dash app.

Ethical Hacking

In today's world, we can categorize hackers into three groups: black hat, gray hat, and white hat hackers. **Black hat hackers** engage in malicious activities such as unauthorized data breaches, theft, and cyber-attacks for personal gain or to cause harm. In contrast, **white hat hackers**, also known as ethical hackers, use their skills to identify and fix security vulnerabilities, often working with organizations to protect against cyber threats. **Gray hat hackers** fall somewhere in between.They sometimes violate laws or ethical standards but not with malicious intent.

The discussion around ethical hacking has grown as cybersecurity threats become more prevalent. Ethical hacking is increasingly recognized as a critical component of cybersecurity strategy, as white hat hackers help prevent data breaches and cyber-attacks by proactively identifying and mitigating vulnerabilities. However, this field also raises ethical questions about privacy, consent, and the potential for misuse of hacking skills, since the line between ethical and unethical hacking can sometimes blur.

1- Theoretical Part

Readings:

- Ethical Hacking: The Story of a White Hat Hacker.Shivanshi Sinha. Dr. Yojna Arora

An Ethical Framework for Hacking Operations

- An Ethical Framework for Hacking Operations
- Documentary: We Are Legion The Story of the Hacktivists Full HD Documentary:

https://www.youtube.com/watch?v=4D1WJsdu6W8

2- Data Analytics Part

You are given datasets as a zip file. You do not have to use all of the data. Please define at least 2 research/business questions. Complete all the steps of the EDA, data cleaning(if necessary) After that make the proper visualizations to be able to answer your business/research questions.

1- IBB Data Breaches

Sector: healthcare, app, retail, gaming, transport, financial, tech, government, telecoms, legal, media, academic, energy,military"

Method: "poor security, hacked, oops! ,lost device ,inside job"

Data sensitivity:

1. Just email address/Online information

2 SSN/Personal details

3 Credit card information

4 Health & other personal records

5 Full details

2- Ethical Hacking dataset by Richard Lee

Hint for visualization:

https://plotly.com/python-api-reference/generated/plotly.express.scatter_geo

https://plotly.com/python/table/

Submission:

The presentations are going to take place on 06.07.2024.
All the materials would be accessible in a public github repository and all the group members should be added as collaborators. There should be a short readme file explaining the project.

After the presentations on the same date the github repo link should be shared with the instructor on the google sheet(deadline 06.07.2024 23:59, Berlin time)

https://docs.google.com/spreadsheets/d/1C7vD3Dndix2I22zHotEw225Z9fwA75gXeTXOzh7ZfW4/edit?usp=sharing

Course Grading Criteria

Attendance: (Minimum 80% required)
- Students must attend a minimum of 80% of the lectures to fulfill this requirement.

Group Works: (30% of the final grade)
- Students are expected to actively participate in group works conducted during lectures. A total of 6 group works will be assigned, with the first one not counted towards the grade.

Final Project Presentation: (70% of the final grade)
- The final project presentation will contribute 80% to the final grade. Students are expected to deliver a comprehensive and well-prepared presentation on their assigned project topic.

Group Project Grading Criteria

Weight: 70% of the final grade

Structure and Organization (15 points)

- Does the presentation have a clear and coherent structure, including the names of the team members, a well-defined introduction, a thorough exploration of the topic, a concise conclusion, and appropriate use of references?
- Do notebooks, python files etc. have a clean and understandable level and structure?

Understanding of the Topic (20 points)

- To what extent does the group demonstrate a deep understanding of the chosen topic? Are key concepts explained clearly and comprehensively?

Coverage of Given Materials (15 points)

- Are the materials provided for the project adequately covered in the presentation?

Effective Use of Tools and Materials (10 points)

- Are the tools and materials utilized in the presentation effectively aligned with the topic? Do they enhance the understanding and engagement of the audience?

Innovation and Additional Research (10 points)

- Has the group conducted additional research or introduced innovative approaches, discussion points, or tools beyond the given materials? Are these contributions insightful and relevant?

Student's Personal Contribution (30 points)

- What is the individual student's contribution to the presentation? To what extent does each student actively participate in the research, preparation, and delivery of the presentation?
- Answering the question(s) the lecturer will direct during the presentation(related to all the topics which are covered during the sessions)

Bonus(10 points)

- Creating a web-app for your project. The instructions will be given in the upcoming session.