Module
MB221, Advanced Visual Analytics

Due date for submission
Check Wiseflow

Teacher and e-mail
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This assignment is worth 100% of the grade of the course. Groups size 2 to 3.

A report (pdf) of maximum 20 pages. In addition, attachments i.e., dashboard(s) and workflow(s).

You are expected to use the prescribed readings from the course. The report must use the prescribed template and use proper in-text citations together with a full references list.

Referencing Chicago, Harvard, or APA.

Please address the following two questions in your submission.

Part 1 – 75% of the Grade
You are given one folder namely "NOKUT_Exam_1", which contains data for year 2018, 2019 and 2020. Every autumn, NOKUT conducts a national student survey (Studiebarometeret) on study quality on behalf of the Ministry of Education and Research. The survey covers almost all Norwegian universities and colleges and ask students to evaluate various quality dimensions such as teaching, supervision, learning environment, commitment, motivation and so on. You are required to use this dataset and design and develop dashboard(s) for the Kristiania Higher Management to help them assess how is Kristiania doing as compared to other universities and colleges on the various quality dimensions and benchmark their best performing and worst performing study programs. Your report should contain arguments supporting choices for tools, data management, data transformation and visualizations deployed. Explain how your dashboard/report would improve decision-making and create value for the organization.

Please note: The submission should have working dashboard(s). Examiner should be able to open your Dashboard. E.g., Save your dashboard as Tableau Packaged Workbook (. twbx).

Part 2 – 25% of the Grade
You are given second dataset "disease_outbreak", which shows the number of cumulative cases and cumulative deaths across eight countries due to this outbreak. E.g., Guinea reported 29 deaths on 23rd March 2014 and 30 deaths on 24th March 2014. The dataset given to you shows cumulative deaths of 59 deaths until 24th March 2014. You are required to clean and transform this given dataset into a tidy data format and develop one or two visualizations to compare the trending of cases and deaths across the eight countries over time. Discuss your reflection and challenges faced as well as the steps taking to mitigate these challenges while implementing the visualizations. Briefly discuss the rationale for selected visualizations i.e., why have you made this choice. Support your rationale with readings from the course.

What is required from the submission?

The submission should have the following items.
1. Dashboard: Working Dashboard(s). It can be one or more dashboard(s) per dataset. Examiner should be able to open your Dashboard. E.g., save your dashboard as Tableau Packaged Workbook (.twbx) with the data included as extracts.

2. Workflows: Alteryx or Prep or others. Please using the naming convention as well.

3. Project Report: Length of the report is approximately 15 to 25 pages (excluding title page and references). It should be submitted as a PDF.

What should the report contain?

The following are some pointers. Please structure your report logically.

- Describe the dataset, variables used, description, data types. Briefly explain how you have transformed the data; provide reasoning and reflections.

- Transformations and rationale (share your workflows). Include key code snippets in the report and discuss them very briefly.

- Rationale for selected visualizations i.e., why have you made this choice. Support your rationale with readings from the course. When you use a book, please indicate the page number as well.

- Discuss how your design has evolved from your first idea to your final design. Show your sketching (showcase your iterations) and evaluations.

- Discuss your reflection and challenges faced as well as the steps taking to mitigate these challenges while implementing the visualizations.

- Present and discuss at least five actionable insights for Part 1 from your dashboard and/or standalone visualizations in detail i.e., how can your audience benefit from your insights. Please state numbers (use tables, visualizations) while discussing these insights.

- In general, your report should contain arguments supporting choices for tools, data management, data transformation and visualizations deployed. Explain how your dashboard/report would improve decision-making and create value for the organization.

Prescribed Readings

1. Shneiderman, B., 1996, September. The eyes have it: A task by data type taxonomy for information visualizations. In Proceedings 1996 IEEE symposium on visual languages (pp. 336-343). IEEE.
2. Fisher, D., DeLine, R., Czerwinski, M. and Drucker, S., 2012. Interactions with big data analytics. interactions, 19(3), pp.50-59.
3. Heer, J., Bostock, M., & Ogievetsky, V. (2010). A tour through the visualization zoo. Commun. ACM, 53(6), 59-67.
4. Knaflic, C. (2015). Storytelling with data: A data visualization guide for business professionals. John Wiley & Sons.
5. Shanmugam, S. and Seshadri, G., 2016, April. Aspects of Data Cataloguing for Enterprise Data Platforms. In 2016 IEEE 2nd International Conference on Big Data Security on Cloud (BigDataSecurity), IEEE International Conference on High Performance and Smart Computing (HPSC), and IEEE International Conference on Intelligent Data and Security (IDS) (pp. 134-139). IEEE.
6. Spruit, M., & Pietzka, K. (2015). MD3M: The master data management maturity model. Computers in Human Behavior, 51, 1068-1076.

7. Wickham, H. (2014). Tidy Data. Journal of Statistical Software, 59(10), 1–23. https://doi.org/10.18637/jss.v059.i10
8. Stahmann, P. (2023). A Prototypical Dashboard for Knowledge-Based Expert Systems used for Real-Time Anomaly Handling in Smart Manufacturing.
9. Matheus, R., Janssen, M., & Maheshwari, D. (2020). Data science empowering the public: Data-driven dashboards for transparent and accountable decision-making in smart cities. Government Information Quarterly, 37(3), 101284.
10. Toreini, P., Langner, M., Maedche, A., Morana, S., & Vogel, T. (2022). Designing attentive information dashboards. Journal of the Association for Information Systems, 23(2), 521-552.
11. Kus, K., Poehler, L., Kajüter, P., Arlinghaus, T., & Teuteberg, F. (2022). Vaccination Dashboard Development during COVID-19: A Design Science Research Approach.
12. Zhang, Y., Sun, Y., Gaggiano, J. D., Kumar, N., Andris, C., & Parker, A. G. (2022). Visualization design practices in a crisis: Behind the scenes with COVID-19 dashboard creators. IEEE Transactions on Visualization and Computer Graphics, 29(1), 1037-1047.
13. Bera, P. (2016). How colors in business dashboards affect users' decision making. Communications of the ACM, 59(4), 50-57.
14. Bera, P. (2014). Do distracting dashboards matter? Evidence from an eye tracking study. In Information Systems: Education, Applications, Research: 7th SIGSAND/PLAIS EuroSymposium 2014, Gdańsk, Poland, September 25, 2014. Proceedings 7 (pp. 65-74). Springer International Publishing.
15. Ware, C. (2013). Information visualization: perception for design (Third ed.): Elsevier, Chapter 4.