

Business Informatics, Systems and Accounting
Henley Business School
University of Reading

Assessed Coursework Set Front Page

Module code: INMR96

Module name: Digital Health and Data Analytics

Lecturer responsible: Dr Weizi (Vicky) Li

Work to be handed in by:

Full-time students: 14-May-2021

Part-time students: 11-June-2021

This coursework contributes to 100% of the overall module assessment.

NOTES:

Coursework must be submitted to Turnitin via Blackboard which gives it a date and time stamp by 2.00pm on the deadline day.

The following penalties will be applied to coursework which is submitted after the deadline for submission:

- where the piece of work is submitted after the original deadline (or any formally agreed extension to the deadline): 10% of the total marks available for that piece of work will be deducted from the mark for each working day (or part thereof) following the deadline up to a total of five working days;
- where the piece of work is submitted more than five working days after the original deadline (or any formally agreed extension to the deadline): a mark of zero will be recorded.

If a student believes he/she has a valid reason for being unable to meet the deadline he/she must complete an Extenuating Circumstances form and submit it as soon as is practicable (in principle before the deadline) to the Programme Administrator at HBS Admin Deck office.

NOTE: It is recommended that you keep a copy of all coursework that you submit.

INMR96 – Digital Health and Data Analytics Coursework Assignment Specification

Coursework Requirements and what to deliver

This module is assessed 100% through this coursework assignment.

The aim of this coursework is to enable students to apply digital health and data analytics concepts, methods and techniques learned to improve healthcare services and outcomes. You must submit an individual report and the report should not exceed 20 pages of A4 with a minimum font size of 10, including tables and diagrams/illustrations but excluding references and appendices.

The student is required to choose one dataset/context from the following options:

- Option 1: MIMIC-III Critical Care Database

MIMIC-III (**M**edical **I**nformation **M**art for **I**ntensive **C**are **III**) is a large, freely-available database comprising deidentified health-related data associated with over forty thousand patients who stayed in critical care units of the Beth Israel Deaconess Medical Center between 2001 and 2012.

The database includes information such as demographics, vital sign measurements made at the bedside (~1 data point per hour), laboratory test results, procedures, medications, caregiver notes, imaging reports, and mortality (both in and out of hospital).

MIMIC supports a diverse range of analytic studies spanning epidemiology, clinical decision-rule improvement, and electronic tool development. Detailed information could be found here <https://mimic.physionet.org/>.

- Option 2: Other healthcare related contexts and datasets that you have access to.

The total of 100 marks will be allocated to the following aspects of the report, which should also be used as a guideline to structure the report.

Problem analysis (15 marks)

You should provide the analysis of the specific problem situation to be addressed. The problem must be specific. You are also expected to justify the reasons why certain problems are chosen using literatures. The student is expected to turn the problem into data analytics questions.

Data description (15 marks)

The student is expected to identify the variables and patient cohort relevant to the problem. The student is expected to describe data preparation and pre-processing process. Exploratory data analysis is expected to examine the data for distribution, outliers and anomalies.

Analytics Methods (15 marks)

The student is expected to use appropriate analytics methods (e.g. unsupervised, supervised learning; k-means regression, classification etc..) to answer research question and solve the identified problem. The student is expected to describe the methods and their appropriateness according to data type and the problem.

Results and evaluation (20 marks)

The student is expected to demonstrate the analytics results or predictive models with result and model evaluation. The student needs to explain how the results will address the problem or answer the research questions.

Solution development (15 marks)

You should turn the analytical results and deliverables into digital health solutions to address the problem in practice. It could be a new decision support application, new interventions, changes in the processes etc for different stakeholders and in the context of existing systems. The student is expected to discuss issues in adopting those digital solutions.

Conclusion (10 marks)

In this section, you should conclude your outcomes, identify and discuss the limitations of your analytics results and digital health solutions. This might include the assessment of the suitability, impact and potential risk as well as further improvements.

There are **10 marks** allocated to the quality of report as follows:

- Consistency, logic of arguments, overall coherence and integration
- Style and structure, including the use of Harvard system of referencing.
If you use MIMIC data or code in your work, please cite the following publication:

MIMIC-III, a freely accessible critical care database. Johnson AEW, Pollard TJ, Shen L, Lehman L, Feng M, Ghassemi M, Moody B, Szolovits P, Celi LA, and Mark RG. Scientific Data (2016). DOI: 10.1038/sdata.2016.35. Available from: <http://www.nature.com/articles/sdata201635>

Note:

Justify your answers/arguments by applying appropriate concepts/methods and reference to relevant literature/articles/sources. Where conditions are underspecified, make reasonable assumptions based on existing organisations or literature, providing the source of information