

## **Information about Deliverables in the Directory**

### **Paper**

- **HCI\_Prerequisite\_Relations.pdf** - A report summarising our findings along with technical appendix.

### **Presentation**

- **Final Presentation.pdf** - Slides that were used for final presentation.

### **CSV Files**

- **Workspace\_prereq.xlsx** - An excel sheet showing the pairs of workspace having a possible prerequisite relation along with the student performance metric.
- Extras:
  - **df\_assistance\_score\_result.csv** - Results of retrospective study design on pair of related workspaces obtained from Gaussian Graphical Models where student performance metric was assistance score.
  - **df\_assistance\_score.csv** - Pairs of related workspaces along with their partial correlation coefficients obtained from Gaussian Graphical Models where student performance metric was assistance score.
  - **df\_success\_rate\_result.csv** - Results of retrospective study design on pair of related workspaces obtained from Gaussian Graphical Models where student performance metric was success rate.
  - **df\_success\_rate.csv** - Pairs of related workspaces along with their partial correlation coefficients obtained from Gaussian Graphical Models where student performance metric was success rate.

### **R Scripts**

- R file for Appendix 1:
  - **Appendix\_1.Rmd** - Using data wrangling techniques, we merge the data on three workspaces and create a dataframe which has success rate for opportunities for each student per KC.
- R file for Appendix 2:
  - **Appendix\_2.Rmd** - We import the dataframe from Appendix 1 and create a function to obtain a Gaussian Graphical Model.
- R file for Appendix 3:
  - **Appendix\_3.Rmd** - This contains the code for GLMER models (for KCs) and retrospective study two-sample t-tests (for workspaces).
- R file for Appendix 4:
  - **Appendix\_4.Rmd** - We use MATHia Course 2 dataset on 500 students and build Gaussian Graphical Models based on two student performance techniques to find pairs of related workspaces.
- Extras:
  - **a\_b\_c.Rmd** - In technical appendix 1, we use data wrangling techniques to clean and transform the data. In technical appendix 2, we built a function to obtain a

GGM plot. Just as a sanity check, in this R file, we build GGM plot where initial opportunities is 2 using other forms of code.

- **MATHIA\_PREREQUISITES.Rmd** - To make an R Shiny app, we use a list to retrieve values for different pairs of workspaces, such as p-value, mean score, etc. In this R file, we create that list (success rate is the student performance metric).
- **MATHIA\_PREREQUISITES2.Rmd** - To make an R Shiny app, we use a list to retrieve values for different pairs of workspaces, such as p-value, mean score, etc. In this R file, we create that list (assistance score is the student performance metric).

### R Shiny App

- Metric - Success Rate:
  - Load **success\_rate\_ggm\_plot.RData** and **success\_rate.RData** in the working directory and run **Rshiny1.Rmd** to get the R Shiny application (success rate is the student performance metric).
- Metric - Assistance Score:
  - Load **assistance\_score\_ggm\_plot.RData** and **assistance\_score.RData** in the working directory and run **Rshiny2.Rmd** to get the R Shiny application (success rate is the student performance metric).