Data Mining and Decision Systems  
600092  
Assigned Coursework Report

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# Methodology

## Business understanding

The data will be analyzed using the CRISP-DM. The data consists of visits to a hospital due to cardiovascular complications. The model being developed will be used to identify patents that are at risk, and therefore there are significant ramifications if the model is malformed therefore false negatives must be avoided when selecting a model. Data protection is also a significant concern however as we only have access to numerical identifiers and therefore identifying individuals would be extremely difficult. The model itself will be used to classify patients to risk or no risk depending on a variety of features, this however may have to be overseen by a trained medical professional due to regulations in the industry.

## Data understanding

Reading the data description gave the data scientist insight into the domains of the columns and suggested. Comments were also provided specifying what each column means along with non-clinical descriptions. This allowed the data scientist to research how certain features could affect risk. Certain medical were harder to decipher such as ischemic and contralateral. Contralateral means opposite side of the body and Ischemic is defined as lack of oxygen leading to necrosis or cell death. Therefore, this means IPSI and Contra are the percentage of oxygen lacking lesions for each side of the body, and the closer they are to 100% the more risk that is involved. This would be verified with a medical professional or the data owner however this is one of the issues working with legacy data.

## Data prep

Due to the data containing invalid or incomplete values, cleaning was required. Removing or imputing these data values would allow for more consistent and accurate visualizing and models.

Using the data description as a guide to ensure data integrity, the data scientist checked the data types as this would aid with finding the domain of the columns, allowing him/her to spot and invalid values.

Provide details on the methodology applied towards the data mining analysis undertaken, providing rationale for these steps.

This should detail how you went from the raw data provided to the chosen model(s), choice of model, and how this methodology helps address the problem domain.

Evidence to support the following of this methodology should be presented, especially any cases which required moving backwards in the process to readdress issues.

# Results

Results should include tables showing model performance with appropriately selected metrics. No rationale should be provided for this section - simply results of evaluative processes.

If using modified variants of the dataset, these should be clearly identified in the tables with appropriate naming. The justification and description of modification is not for this section.

Additional figures may be used as appropriate, in support of discussion points in the Evaluation & Discussion section, or as evidence for methodology following above.

# Evaluation & Discussion

Evaluation methodology used for generating the results provided in the previous section. How were these evaluated? Why was this selected? What metrics were used and why?

Discussion of the results should be presented with appropriate evidence and rationale. E.g Which is the best model, and why?

Consider each stage in the methodology, and reflect on any improvements which could have been made. Could any techniques have been used which may have improved performance? Why?

# References

Any references used throughout the report should be included here in Hull Harvard Style. If no references used, remove this section.