

CHAPTER V

CONCLUSION

This chapter presents conclusions from the results of the analysis of the bronchitis prediction model using the CatBoost algorithm, the interpretation of the model with SHAP, and the application of a rule-based drug recommendation system. In addition, in this section, suggestions are also given as a follow-up to the research.

5.1 Conclusion

Based on the results of research and testing that has been carried out, several conclusions are obtained as follows:

1. The CatBoost model used to predict indications of bronchitis shows a fairly good performance. In the training and test data sharing scenario with a ratio of 60:40, 70:30, and 80:20, the model evaluation value was consistent in the accuracy range of 81%–82%, with the highest score results in training and test with a ratio of 80:20 with an Accuracy of 83%, Precision 75%, Recall 84%, and F1-Score of 79%.
2. This shows that the model is able to detect cases of bronchitis fairly stably.
3. Model interpretation using the SHAP method helps in understanding the contribution of each symptom to prediction. Features such as periods of coughing, wheezing, shortness of breath, fever, and sore throat proved to be important indicators that influenced the model's decisions.
4. The application of a rule-based system at the drug recommendation stage successfully links the combination of patients' symptoms with the appropriate over-the-counter (OTC) drug list. The system can provide relevant medication recommendations, as well as suggest consultation with a doctor if symptoms are severe.
5. Based on drug recommendation testing, the system is able to provide results that are close to the original prescription and produce OTC drug alternatives that are safe for patients to use. This proves that the integration between CatBoost's prediction model and rule-based system can improve the accuracy and relevance of drug recommendations.

5.1 Suggestions

As a follow-up to this study, some suggestions that can be given are:

1. Dataset Development, The next research can use datasets with a larger and varied amount of data, so that the model performance is better and the results of recommendations are more accurate.

2. System Integration, Prediction Models and Drug Recommendation Systems can be further developed in the form of web-based or mobile applications, so that they can be used directly by pharmacies and patients.
3. Addition of Clinical Rules, Rules in a rule-based system can be expanded by adding other relevant symptoms, as well as adjusted to the latest medical guidelines to make drug recommendations more precise.