**Faculty of Computing and Technology**

**University of Kelaniya**

**Bachelor of Science Honours in Computer Science Degree**

**CSCI 43018 – Project**

**Academic Year 2021/2022**

# Project Diary

**Project Title: Heart Disease prediction using Machine learning and Deep learning techniques.**

**Name of the Supervisor: Ms. P.H.A.H.K. Yasodara**

**Student Name: P.M.B.D. SAMARAKOON**

**Student Index Number:** CS/2018/037

Meeting No: ……01…..  Meeting Date: 2023-12-03

| Tasks assigned in the previous meeting | If **completed** briefly describe the way you reached/solved the task/issue | If **not completed** clearly state the reason |
|---|---|---|
| 1.<br>2.<br>3.<br>4.<br>5. | | |
| Points/tasks/issues discussed at the current meeting | • Discussed the selected topic, " Heart Disease prediction using Machine learning and Deep learning techniques" with the supervisor. Also discussed the pros and cons of the approach.<br>• Overview of the project objectives and scope.<br>• Initial literature review and dataset search.<br>• Setting up the project plan and timeline.<br>• Identifying initial tasks and responsibilities. | |
| Targets/tasks assign to complete before the next meeting | • Should found a suitable data set<br>• Search and identify suitable datasets.<br>• Prepare the development environment.<br>• Outline the initial project structure.<br>• Schedule the next meeting. | |

**Please make sure to contact/meet your supervisor/s **at least** once a month

Signature of the supervisor: ……  Date: ……

# Self-diary

Project Title: Heart Disease prediction using Machine learning and Deep learning techniques

Month: 2023/12 Index Number: CS/2018/037

| Week | Date | Description of work carried out, Problems found and the way solved, etc. |
|---|---|---|
| **Week 1** | 12/03 | |
| | 12/04 | Started searching for a suitable dataset on Google. |
| | 12/05 | Found an initial dataset but deemed it unsuitable for the project. |
| | 12/06 | Identified a more suitable dataset for the project. |
| | 12/07 | Downloaded and prepared the selected dataset for analysis |
| | 12/08 | |
| | 12/09 | |
| | | |
| **Week 2** | 12/10 | |
| | 12/11 | Summarized key findings from the reviewed papers. |
| | 12/12 | Go through the data set and studied it |
| | 12/13 | Started the project |
| | 12/14 | Studied the methods |
| | 12/15 | |
| | 12/16 | |
| | | |
| **Week 3** | 12/17 | |
| | 12/18 | |
| | 12/19 | Began initial data preprocessing, handling missing values. |
| | 12/20 | Normalized features in the dataset. |
| | 12/21 | Set up the development environment with necessary libraries. |
| | 12/22 | Studied a ML models |
| | 12/23 | Studied a ML models |
| | | |
| **Week 4** | 12/24 | |
| | 12/25 | |
| | 12/26 | Continued data preprocessing, focusing on feature engineering. |
| | 12/27 | Studied the structure and contents of the dataset. |
| | 12/28 | Insert dataset and do some analyze |
| | 12/29 | Started the project implementation. |
| | 12/30 | |
| | | |
| **Week 5** | 12/31 | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Meeting No: ……02……  Meeting Date: 2024-01-11

| Tasks assigned in the previous meeting | If **completed** briefly describe the way you reached/solved the task/issue | If **not completed** clearly state the reason |
|---|---|---|
| 1. Find a dataset<br>2. Study the model<br>3. Study ML models<br>4. Conduct a detailed literature review on heart disease prediction using ML and DL.<br>5. Search and identify suitable datasets.<br>6. Prepare the development environment.<br>7. Schedule the next meeting. | • Found a suitable data set from the Kaggle. Go through some ML models<br>• Completed by reviewing and summarizing key findings from research papers.<br>• Found and prepared a suitable dataset for analysis.<br>• Set up with necessary libraries and tools. | |
| Points/tasks/issues discussed at the current meeting | • Review of literature and datasets.<br>• Initial data preprocessing and feature engineering.<br>• Setting up machine learning models.<br>• Discussion of initial results and challenges faced. | |
| Targets/tasks assign to complete before the next meeting | • Complete data preprocessing and feature engineering.<br>• Implement Logistic Regression and Decision Tree classifiers.<br>• Evaluate the initial models' performance.<br>• Research additional ML models like Random Forest and SVM. | |

**Please make sure to contact/meet your supervisor/s **at least** once a month

Signature of the supervisor: ……  Date: ……

# Self-diary

Project Title: Heart Disease prediction using Machine learning and Deep learning techniques

Month: 2024/01 Index Number: CS/2018/037

| Week | Date | Description of work carried out, Problems found and the way solved, etc. |
|---|---|---|
| **Week 1** | | |
| | | |
| | 01/02 | Completed initial Logistic Regression implementation. |
| | 01/03 | Researched various machine learning methods relevant to the project. |
| | 01/04 | Continued research on machine learning models. |
| | | |
| | | |
| | | |
| **Week 2** | | |
| | | |
| | | |
| | 01/10 | Began implementing Logistic Regression using scikit-learn. |
| | 01/11 | Studied Random forest |
| | 01/12 | Studied SVM |
| | | |
| | | |
| **Week 3** | | |
| | | |
| | | |
| | 01/17 | Implemented Decision Tree classifier using scikit-learn. |
| | 01/18 | Studied Decision Tree algorithms for implementation. |
| | 01/19 | Faced issues with missing values; resolved by imputing median values. |
| | 01/20 | Started clean the data set |
| | | |
| **Week 4** | | |
| | | |
| | 01/23 | Started clean the data set |
| | | |
| | | |
| | 01/26 | Watched related videos and study more |
| | 01/27 | Evaluated the performance of Logistic Regression and Decision Tree, achieving 78.5% and 81.0% accuracy, respectively. |
| | | |
| **Week 5** | 01/28 | |
| | 01/29 | |
| | 01/30 | |
| | 01/31 | Reviewed the performance metrics of initial models. |
| | | |
| | | |
| | | |

Meeting No: ……03……. Meeting Date: 2024-02-15

| Tasks assigned in the previous meeting | If **completed** briefly describe the way you reached/solved the task/issue | If **not completed** clearly state the reason |
|---|---|---|
| 1.. fix the issues with the dataset and model issues<br>2. Complete data preprocessing and feature engineering.<br>3. implement Logistic Regression and Decision Tree classifiers. | • Completed with normalization and feature engineering techniques.<br>• Successfully implemented using scikit-learn.<br>• Achieved 78.5% and 81.0% accuracy for Logistic Regression and Decision Tree respectively. | |
| Points/tasks/issues discussed at the current meeting | • Review of completed tasks and model performance.<br>• Discussion on challenges faced during model implementation. | |
| Targets/tasks assign to complete before the next meeting | • Implement and evaluate Random Forest and SVM models.<br>• Finalize CNN architecture and start implementation. | |

**Please make sure to contact/meet your supervisor/s **at least** once a month

Signature of the supervisor: …… Date: ……

# Self-diary

Project Title: Heart Disease prediction using Machine learning and Deep learning techniques

Month: 2024/02 Index Number: CS/2018/037

| Week | Date | Description of work carried out, Problems found and the way solved, etc. |
|---|---|---|
| **Week 1** | | |
| | | |
| | | |
| | | |
| | | |
| | 02/06 | Researched Random Forest and SVM for further implementation. |
| | 02/07 | Began implementing Random Forest classifier. |
| | | |
| **Week 2** | | |
| | | |
| | | |
| | | |
| | 02/12 | Faced challenges with hyperparameter tuning; started using GridSearchCV. |
| | 02/13 | Completed implementation of Random Forest classifier |
| | 02/14 | Implemented SVM classifier. |
| | | |
| **Week 3** | | |
| | | |
| | | |
| | | |
| | 02/19 | Evaluated SVM, achieving 82.5% accuracy. |
| | 02/20 | compared the performance of all implemented machine learning models. |
| | | |
| | | |
| **Week 4** | | |
| | | |
| | | |
| | | |
| | 02/25 | Started setting up the environment for CNN implementation. |
| | 02/26 | Faced data reshaping issues for CNN; resolved by adjusting input dimensions. |
| | | |
| | | |
| **Week 5** | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Meeting No: ……04……. Meeting Date: 2024-03-28

| Tasks assigned in the previous meeting | If **completed** briefly describe the way you reached/solved the task/issue | If **not completed** clearly state the reason |
|---|---|---|
| 1. Evaluate the initial models' performance.<br>2. Research additional ML models like Random Forest and SVM.<br>3. Plan for CNN implementation. | • Completed with normalization and feature engineering techniques.<br>• Successfully implemented using scikit-learn.<br>• Achieved 78.5% and 81.0% accuracy for Logistic Regression and Decision Tree respectively. | |
| Points/tasks/issues discussed at the current meeting | • Review of completed tasks and model performance.<br>• Discussion on challenges faced during model implementation. | |
| Targets/tasks assign to complete before the next meeting | • Implement and evaluate Random Forest and SVM models.<br>• Finalize CNN architecture and start implementation.<br>• Plan for CNN implementation. | |

**Please make sure to contact/meet your supervisor/s **at least** once a month

Signature of the supervisor: …… Date: ……

# Self-diary

Project Title: Heart Disease prediction using Machine learning and Deep learning techniques

Month: 2024/03 Index Number CS/2018/037

| Week | Date | Description of work carried out, Problems found and the way solved, etc. |
|---|---|---|
| **Week 1** | | |
| | | |
| | | |
| | | |
| | 03/05 | Continued work on CNN implementation. |
| | 03/06 | Completed initial training of CNN. |
| | | |
| | | |
| **Week 2** | | |
| | | |
| | | |
| | | |
| | 03/11 | Documented final CNN model and results. |
| | | |
| | 03/13 | Integrated all models for comprehensive comparison. |
| | | |
| **Week 3** | | |
| | | |
| | | |
| | | |
| | | |
| | 03/19 | Finalized the report with all necessary improvements. |
| | 03/20 | Rehearsed the presentation for the final session. |
| | | |
| **Week 4** | | |
| | | |
| | | |
| | | |
| | | |
| | 03/26 | Followed up on any remaining feedback. |
| | 03/27 | Addressed final feedback and ensured all project components were completed and submitted. |
| | | |
| **Week 5** | | |
| | | |
| | | |
| | | |
| | | |

Meeting No: ……05……. Meeting Date: 2024-05-10

| Tasks assigned in the previous meeting | If **completed** briefly describe the way you reached/solved the task/issue | If **not completed** clearly state the reason |
|---|---|---|
| 1. Continue hyperparameter tuning for all models.<br>2. Complete CNN implementation..<br>3. Integrate all models for final evaluation. | • Continued and completed hyperparameter tuning for all models.<br>• Continued and completed hyperparameter tuning for all models. | |
| Points/tasks/issues discussed at the current meeting | • Review of CNN performance.<br>• Integration of all models for final evaluation.<br>• Discussion on the draft report and presentation.<br>• Feedback on initial results. | |
| Targets/tasks assign to complete before the next meeting | • Finalize the integration of all models.<br>• Complete the final evaluation of models.<br>• Schedule the next meeting.<br>• Add another DL model<br>• Start to write thesis | |

**Please make sure to contact/meet your supervisor/s **at least** once a month

Signature of the supervisor: …… Date: ……

# Self-diary

Project Title: Heart Disease prediction using Machine learning and Deep learning techniques

Month: 2024/05 Index Number CS/2018/037

| Week | Date | Description of work carried out, Problems found and the way solved, etc. |
|---|---|---|
| **Week 1** | | |
| | | |
| | | |
| | | |
| | 05/16 | Finalize the integration of all models. |
| | 05/17 | Give comparison of all models. |
| | | |
| | | |
| **Week 2** | | |
| | | |
| | | |
| | | |
| | | |
| | 05/24 | Complete the final evaluation of models. |
| | 05/25 | Add keras Model |
| | | |
| **Week 3** | | |
| | | |
| | | |
| | | |
| | | |
| | 05/31 | Studied the Keras model |
| | | |
| | | |
| **Week 4** | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| **Week 5** | | |
| | | |
| | | |
| | | |
| | | |
| | | |

# Self-diary

Project Title: Heart Disease prediction using Machine learning and Deep learning techniques

Month: 2024/06 Index Number: CS/2018/037

| Week | Date | Description of work carried out, Problems found and the way solved, etc. |
|---|---|---|
| **Week 1** | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | 06/07 | Implement the Keras model |
| | | |
| **Week 2** | | |
| | | |
| | | |
| | | |
| | | |
| | 06/13 | Finished with keras model |
| | 06/14 | Get comparison of CNN and Keras |
| | | |
| **Week 3** | | |
| | | |
| | | |
| | 06/18 | Make structures for thesis |
| | 06/19 | Write a introduction and literature survey |
| | 06/20 | Write a introduction and literature survey |
| | | |
| | | |
| **Week 4** | | |
| | | |
| | | |
| | | |
| | 06/25 | Completed introduction and literature survey |
| | 06/26 | Tried to get more accuracy |
| | | |
| | | |
| **Week 5** | | |
| | | |
| | | |
| | 06/30 | Tried to get more accuracy and low log loss |
| | | |
| | | |
| | | |

Meeting No: ……06…….  Meeting Date: 2024-07-03

| Tasks assigned in the previous meeting | If **completed** briefly describe the way you reached/solved the task/issue | If **not completed** clearly state the reason |
|---|---|---|
| 1. Finalize the integration of all models.<br>2. Complete the final evaluation of models.<br>3. continue the thesis | • Integrated all models for comprehensive comparison. | |
| Points/tasks/issues discussed at the current meeting | • Review of final evaluation results.<br>• Discussion on improving model accuracy.<br>• Future work and potential improvements.<br>• Run-time and performance of the project. | |
| Targets/tasks assign to complete before the next meeting | • Explore additional techniques to improve model accuracy.<br>• Document future work and potential improvements.<br>• Ensure the project runs smoothly and address any issues.<br>• Schedule the next meeting. | |

**Please make sure to contact/meet your supervisor/s **at least** once a month

Signature of the supervisor: ……  Date: ……

# Self-diary

Project Title: Heart Disease prediction using Machine learning and Deep learning techniques

Month: 2024/07 Index Number: CS/2018/037

| Week | Date | Description of work carried out, Problems found and the way solved, etc. |
|---|---|---|
| Week 1 | | |
| | | |
| | | |
| | | |
| | | |
| | 07/06 | Completed the final evaluation of models and documented results. |
| | 07/07 | Worked on improving model accuracy using ensemble techniques. |
| | | |
| Week 2 | | |
| | | |
| | | |
| | | |
| | 07/14 | Started write Objectives and Requirements Specification |
| | 07/13 | Add more to Objectives and Requirements Specification |
| | 07/15 | Documented potential future work and improvements. |
| | | |
| Week 3 | | |
| | | |
| | | |
| | | |
| | | |
| | 07/19 | Started write Methodology part |
| | 07/20 | Ensured the project runs smoothly and addressed any performance issues. |
| | | |
| Week 4 | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | 07/27 | Explore additional techniques to improve model accuracy |
| | | |
| Week 5 | | |
| | | |
| | | |
| | | |

Meeting No: ……07…….  Meeting Date: 2024-08-03

| Tasks assigned in the previous meeting | If **completed** briefly describe the way you reached/solved the task/issue | If **not completed** clearly state the reason |
|---|---|---|
| 1. Finalize the integration of all models.<br>2. Finalize the report and presentation.<br>3. continue the thesis | • Conducted final evaluation and documented results.<br>• Integrated all models for comprehensive comparison. | |
| Points/tasks/issues discussed at the current meeting | • Review of final evaluation results.<br>• Final adjustments to thesis.<br>• Some points should be correct in thesis | |
| Targets/tasks assign to complete before the next meeting | • Submit the final thesis.<br>• Follow up on any remaining feedback. | |

**Please make sure to contact/meet your supervisor/s **at least** once a month

Signature of the supervisor: ……  Date: ……

# Self-diary

Project Title: Heart Disease prediction using Machine learning and Deep learning techniques

Month: 2024/08 Index Number: CS/2018/037

| Week | Date | Description of work carried out, Problems found and the way solved, etc. |
|---|---|---|
| **Week 1** | | |
| | 08/02 | Prepared the thesis. Finished it |
| | 08/03 | Add some more points to literature survey and introduction |
| | 08/04 | Add more to methodology |
| | | |
| | | |
| **Week 2** | 08/05 | Add implementation part, testing and model |
| | 08/06 | Add result part. Completed the thesis |
| | 08/07 | Do corrections in thesis |
| | | |
| | | |
| | | |
| | | |
| | | |
| **Week 3** | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| **Week 4** | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| **Week 5** | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |