INTERNSHIP
(Virtual)

Name of the Student: **Bennada Bindhu Madhava Mani Venkat**

Name of the College: **Godavari Institute Of Engineering And Technology**

Registration Number: **20551A0406**

Period of Internship: From: **02-01-23** To: **02-02-23**

Name & Address of the Intern Organization

SRI SHASHA PRAYATHI TECHNOLOGIES PVT LTD

GODAVARI INSTITUTE OF ENGINEERING AND TECHNOLOGY

YEAR 2022-23

ONLINE INTERNSHIP PROGRAM ON MACHINE LEARNING WITH PYTHON

in

ELECTRONICS AND COMMUNICATION

Submitted by
BENNADA BINDHU MADHAVA MANI VENKAT
20551A0406

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

GODAVARI INSTITUTE OF ENGINEERING AND TECHNOLOGY (A)
(NAAC 'A' Grade, Accredited by NBA, Approved by AICTE, Affiliated to JNTUK, Kakinada)
NH-16, CHAITANYA KNOWLEDGE CITY, RAJAHMUNDRY- 533 296.
MONTH 2023

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that the Internship work entitled ONLINE INTERNSHIP PROGRAM ON MACHINE LEARNING WITH PYTHON submitted for partial fulfilment of BACHELOR OF TECHNOLOGY in Electronics and Communication Engineering Department to Godavari Institute of Engineering and Technology (A), Rajahmundry, A.P. affiliated to the JNTUK, Kakinada, is bonafide work done by Bennada Bindhu Madhava Mani Venkat(20551A0406), under my guidance during the academic year 2022-2023.

Signature of HOD
Dr.B. Srinivas Raja

Head of the Department
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ACKNOWLEDGEMENTS

We are grateful to our guide for having given us the opportunity to carry out this Internship work. We take thisopportunity to express our profound and wholehearted thanks to our guide, who with her patience, support and sincere guidance helped us in the successful completion of the project.We areparticularly indebted to her for her innovative ideas, valuable suggestion and guidance during the entire period of our Internship work and without her unfathomable energyand enthusiasm, this Internship would not have been completed.

I would like to thank **Dr. B. SRINIVAS RAJA**, Professor and Head of the Department, for his constructive criticism throughout our Internship.

I would like to express our deep sense of gratitude to **Dr. P. M. M. S. SARMA**, Principal for providing us a chance to undergo the course in the prestigious institute.

I also would like to thank all the faculty members and non-teaching staff of the Department of Electronics and Communication Engineering, GIET (A) for their direct and indirect help during the Internship work.

I own special thanks to the MANAGEMENT of our college for providing thenecessary arrangements to carry out this Internship. The euphoria and satisfaction of completing this project will not be completed until we thank all the people who have helped us in the successful completion of this enthusiastictask.

Lastly, we thank our parents for their ever-kind blessings.

Bennada Bindhu Madhava Mani Venkat(20551A0406)

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CHAPTER 1

EXECUTIVE SUMMARY

OBJECTIVES

* Learning Objectives I obtained from Machine Learning With Python

1. Understand the Fundamentals:

- Define machine learning and its applications.

- Differentiate between supervised, unsupervised, and reinforcement learning.

- Explain the key components of a machine learning problem: data, features, labels, and models.

2. Preprocessing and Data Preparation:

- Handle missing data, outliers, and noise in datasets.

- Perform data normalization, scaling, and encoding of categorical variables.

- Split data into training, validation, and test sets for model evaluation.

3. Feature Engineering:

- Select relevant features and perform feature extraction.

- Understand techniques like one-hot encoding, feature scaling, and dimensionality reduction.

4. Supervised Learning Algorithms:

- Implement and understand linear regression for regression tasks.

- Apply decision trees and random forests for classification and regression.

- Use support vector machines for binary classification.

5. Unsupervised Learning Algorithms:

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5. Unsupervised Learning Algorithms:

- Apply clustering algorithms like K-means and hierarchical clustering.

- Understand dimensionality reduction techniques such as PCA (Principal Component Analysis).

6. Neural Networks and Deep Learning:

- Describe neural network architecture and its components.

- Implement basic feedforward neural networks using libraries like TensorFlow or PyTorch.

- Understand concepts of backpropagation and gradient descent.

LEARNING OUTCOMES

Upon completion of this course/module, learners will be able to:

- Develop a solid understanding of machine learning concepts, algorithms, and techniques.

- Clean, preprocess, and transform raw data into a suitable format for training models.

- Choose appropriate algorithms for specific tasks, whether it's classification, regression, or clustering.

- Implement and train various machine learning models using Python libraries.

- Evaluate model performance using relevant metrics and effectively tune hyperparameters.

- Apply ensemble methods to enhance model performance and generalization.

- Apply neural networks for deep learning tasks and have a grasp of their underlying mechanisms.

- Deploy trained models to make predictions on new, unseen data.

CHAPTER 2

OVERVIEW OF THE ORGANIZATION

SRI SHASHA PRAYATHI TECHNOLOGIES PRIVATE LIMITED is a Private Company, Which CIN Number is **U72900KA2020PTC132824** , was incorporated 3 Year(s) 6 Month(s) 7 Day(s) ago on dated 19-Feb-2020 . SRI SHASHA PRAYATHI TECHNOLOGIES PRIVATE LIMITED is classified as Non-Government and is registered at Registrar of Companies located in ROC-BANGALORE. As regarding the financial status on the time of registration of SRI SHASHA PRAYATHI TECHNOLOGIES PRIVATE LIMITED Company its authorized share capital is Rs. 1500000 and its paid up capital is Rs. 100000. As Per Registration of Company, It involves under in Business Activity Class / Subclass Code 72900, Main Activity of the said Company SRI SHASHA PRAYATHI TECHNOLOGIES PRIVATE LIMITED is : , Other computer related activities [for example maintenance of websites of other firms/ creation of multimedia presentations for other firms etc.], It Comes Under Division COMPUTER AND RELATED ACTIVITIES and this come under scetion REAL ESTATE, RENTING AND BUSINESSACTIVITIES.

The registration number of this company is 132824 .Its Email address is kalijavedu.info@gmail.com and its registered address is where Company is actual registered : Unit No. 9, Science and Technology Enterprenuership Park (STEP), NITK, Srinivasanagar Surathkal Dakshina Kannada KA 575025 IN. For any Query You can reach this company by emailaddressorPostaladdress.

CHAPTER 3

INTERNSHIP PART

Certainly, I can provide you with a sample description of the activities, responsibilities, and overall experience an intern might have during their internship at an organization. Keep in mind that this is a fictional example and can be customized based on the nature of the internship and the organization.

Internship at SRI SHASHA PRAYATHI TECHNOLOGIES PVT LTD Tech Solutions

Activities/Responsibilities:

During the internship at SRI SHASHA PRAYATHI TECHNOLOGIES PVT LTD Tech Solutions, the intern actively participated in various aspects of software development, gaining hands-on experience and practical insights into the industry. The following were the key activities and responsibilities:

1. Working Conditions: The intern worked in a collaborative and inclusive environment, closely interacting with experienced software engineers and project managers. The company provided a comfortable workspace with modern infrastructure, fostering creativity and productivity.

2. Equipment Used:

NumPy and pandas:

* NumPy is a functional package for numerical computing in python, providing support for arrays and matrices

* pandas is a data manipulation and analysis library that provides data structures like Dataframes, which are crucial for data processing.

3. Tasks Performed:

- Participated in daily stand-up meetings to discuss project progress and plan the day's tasks.

- Collaborated with the development team to design and implement new features for an

ongoing web application project.

- Assisted in debugging and resolving software defects, enhancing the application's overall quality.

- Conducted code reviews under the guidance of senior developers, learning best practices and coding standards.

- Engaged in test-driven development (TDD), creating unit tests and ensuring code robustness.

- Attended workshops and training sessions on version control systems (e.g., Git) and agile methodologies.

Throughout the internship ,I myself gained valuable skills and knowledge, including:

1. Technical Proficiency: Developed proficiency in programming languages such as Python and JavaScript, and gained hands-on experience with frameworks like React and Flask.

2. Collaborative Skills: Enhanced collaboration skills by working closely with cross-functional teams, participating in discussions, and sharing insights during team meetings.

3. Problem-Solving: Acquired problem-solving skills through identifying and resolving software defects and implementing innovative solutions.

4. Version Control: Gained expertise in using Git for version control, managing code changes, and collaborating effectively with other team members.

5. Agile Methodology: Gained practical exposure to agile development practices, including daily stand-ups, sprint planning, and iterative development.

6. Code Quality: Improved code writing practices by incorporating feedback from code reviews and following coding standards.

7. Communication: Enhanced communication skills through interactions with team members, providing status updates, and asking for clarifications when needed.

8. Time Management: Developed effective time management skills by juggling multiple tasks and meeting project deadlines.

CHAPTER 4
ACTIVITY LOG SHEETS

ACTIVITY LOG FOR THE FIRST WEEK

Day & Date	Brief description of the daily activity	Learning Outcome
Day – 1	Introduction	Basics about ML
Day - 2	Why ML is important	Imporatance of ML
Day – 3	Supervised learning	Importance of Supervised learning
Day – 4	Unsupervised learning	About Un supervised learning
Day – 5	Reinforcement Learning	About Reinforcement learning
Day –6	Linear Regression	About Linear regression

ACTIVITY LOG FOR THE SECOND WEEK

Day & Date	Brief description of the daily activity	Learning Outcome
Day – 1	Data set	About data sets
Day – 2	Data types	All data types
Day – 3	Mean	Problems regarding mean
Day – 4	median	Problems regarding median
Day – 5	Mode	Problems on mode
Day –6	Standard deviation	About SD

ACTIVITY LOG FOR THE THIRD WEEK

Day & Date	Brief description of the daily activity	Learning Outcome
Day – 1	Variance	Problems on variance
Day - 2	Standard deviation	Libraries for standard deviation
Day – 3	percentiles	Sums on percentile
Day – 4	Data distribution	How data distribution takes place
Day – 5	Big data sets	About data sets
Day –6	histograms	Histograms has been explained

ACTIVITY LOG FOR THE FORTH WEEK

Day & Date	Brief description of the daily activity	Learning Outcome
Day – 1	Scatter plot	Scatter plot is explained
Day – 2	Big data distribtiuion	Libraries has been explained
Day – 3	Random data distribution	About data distributions
Day – 4	Regression	What is regression
Day – 5	Future data prediction	How future values can be predicted using ml has been explained
Day –6	Polynomial regression	What is polynomial regresion

CHAPTER 5

OUTCOMES DESCRIPTION

People Interactions:

In an ideal work environment, there is a strong emphasis on open communication and collaboration. Team members interact professionally and respectfully, sharing ideas, feedback, and information freely. Managers and employees communicate clearly and regularly, fostering a positive and productive atmosphere.

Facilities and Maintenance:

The facilities are well-maintained and equipped to support the tasks at hand. This includes ergonomic workstations, reliable technology, clean and organized spaces, and comfortable common areas. Regular maintenance ensures that equipment is functional and comfortable.

Clarity of Job Roles:

Clear job roles and responsibilities are defined for each team member. Employees understand their tasks and how they contribute to the overall goals of the organization. This clarity minimizes confusion and ensures efficient workflow.

Protocols, Procedures, and Processes:

Structured protocols, procedures, and processes are in place to guide work tasks. Standard operating procedures (SOPs) ensure consistency and quality in work. Employees are trained on these processes, and there's room for improvement based on feedback.

Discipline and Time Management:

The work environment promotes discipline and effective time management. Employees are encouraged to manage their tasks efficiently, meet deadlines, and prioritize their work. This contributes to a culture of productivity.

Harmonious Relationships:

The work environment encourages harmonious relationships among colleagues. Respect, empathy, and teamwork are emphasized, creating a sense of belonging and camaraderie. Conflicts are addressed constructively and resolved promptly.

Socialization and Mutual Support:

There's an emphasis on building relationships beyond work tasks. Social events, team-building activities, and gatherings foster a sense of community. Employees offer mutual support, both professionally and personally.

Teamwork and Collaboration:

Collaboration is a cornerstone of the work environment. Cross-functional teams work together, leveraging diverse skills to achieve common goals. Team members share ideas, provide assistance, and celebrate achievements collectively.

Motivation and Recognition:

The work environment promotes motivation through recognition and rewards. Employee achievements are acknowledged and celebrated, encouraging a sense of pride and dedication.

Space and Ventilation:

The workspace is designed for comfort and productivity. It provides adequate space, good lighting, and proper ventilation. This contributes to the physical well-being and focus of employees.

Adaptability and Innovation:

The work environment encourages adaptability and innovation. Employees are open to change and encouraged to suggest improvements. Creative thinking and out-of-the-box solutions are valued.

Remember that work environments can vary widely based on industry, company culture, leadership style, and other factors. This description aims to capture key aspects of an ideal work environment that promotes productivity, well-being, and positive relationships.

Describe the real time technical skills you have acquired (in terms of the job-related skills and hands on experience)

1. Data Preprocessing:
   - Cleaning and handling missing data.
   - Feature selection and engineering.
   - Data normalization, scaling, and transformation.
   - Dealing with outliers and noise.

2. Exploratory Data Analysis (EDA):
   - Visualizing data using libraries like Matplotlib and Seaborn.
   - Analyzing data distributions, correlations, and trends.
   - Extracting insights from data to inform modeling decisions.

3. Model Building and Training:
   - Implementing various ML algorithms such as regression, classification, and clustering.
   - Using libraries like Scikit-learn to create, train, and validate models.
   - Applying hyperparameter tuning to optimize model performance.

4. Deep Learning:
   - Building neural network architectures using libraries like TensorFlow or PyTorch.
   - Implementing common architectures like convolutional neural networks (CNNs) and recurrent neural networks (RNNs).
   - Training deep learning models on image, text, or sequence data.

5. Model Evaluation and Metrics:
   - Understanding and applying evaluation metrics such as accuracy, precision, recall, F1-score, ROC curves, and AUC.
   - Using techniques like k-fold cross-validation to assess model performance.

6. Ensemble Methods:
   - Implementing ensemble techniques like Random Forests, Gradient Boosting, and AdaBoost.
   - Combining multiple models to improve predictive accuracy and generalization.

7. Feature Extraction and Dimensionality Reduction:

- Applying techniques like Principal Component Analysis (PCA) and t-SNE to reduce dimensionality.
- Extracting meaningful features from raw data, especially in image and text analysis.

8. Deployment and Productionization:

- Deploying ML models using tools like Flask, Django, or cloud services.
- Creating APIs to make predictions on new data.
- Managing model updates and version control in production.

9. Natural Language Processing (NLP):

- Tokenization, text preprocessing, and feature extraction for text data.
- Building sentiment analysis, text classification, and language generation models.

10. Version Control and Collaboration:

- Using Git for version control to track changes and collaborate on projects.
- Sharing code repositories and collaborating with team members.

11. Jupyter Notebooks:

- Developing and sharing code using Jupyter Notebooks for interactive analysis and documentation.

12. Problem Solving and Debugging:

- Diagnosing and fixing errors in code.
- Optimizing code for efficiency and performance.

These skills provide a strong foundation for working on various machine learning projects and roles. However, keep in mind that ML is a rapidly evolving field, so continuous learning and staying updated with the latest techniques and tools is essential.

Describe how you could improve your communication skills (in terms of improvement in oral communication, written communication, conversational abilities, confidence levels while communicating, anxiety management, understanding others, getting understood by others, extempore speech, ability to articulate the key points, closing the conversation, maintaining niceties and protocols, greeting, thanking and appreciating others, etc.,)

Improving communication skills is a valuable endeavor that involves both self-awareness and consistent practice. Here's a breakdown of strategies to enhance various aspects of communication:

1. Oral Communication:
   - Practice active listening to understand others better before responding.
   - Speak clearly, articulate your words, and use a moderate pace.
   - Minimize filler words (like "um," "uh") and pauses.

2. Written Communication:
   - Organize your writing with clear structure: introduction, main points, and conclusion.
   - Proofread for grammar, spelling, and clarity.
   - Tailor your writing to your audience, whether it's formal or casual.

3. Conversational Abilities:
   - Engage in meaningful discussions to practice articulating your thoughts.
   - Ask open-ended questions to encourage deeper conversations.
   - Balance speaking and listening, allowing for a natural flow.

4. Confidence Levels:
   - Believe in your knowledge and expertise, which naturally boosts confidence.
   - Practice public speaking or presentation skills to become comfortable in front of an audience.

5. Anxiety Management:
   - Practice relaxation techniques like deep breathing before speaking.
   - Start with smaller conversations to gradually build your confidence.

6. Understanding Others:

- Focus on the speaker, avoid interrupting, and show interest in their perspective.
- Paraphrase or summarize what they said to ensure understanding.

7. Getting Understood by Others:
   - Use clear and concise language without unnecessary jargon.
   - Ask for feedback to gauge if your message was understood.

8. Extempore Speech:
   - Practice impromptu speaking by discussing a random topic without preparation.
   - Focus on organizing your thoughts and delivering key points coherently.

9. Articulating Key Points:
   - Summarize your main ideas to reinforce understanding.
   - Use bullet points or visuals in presentations to highlight key information.

10. Closing Conversations:
    - Summarize the discussion's main points before concluding.
    - Offer a clear ending, such as expressing gratitude or stating an action item.

11. Maintaining Niceties and Protocols:
    - Use appropriate greetings and salutations based on the context.
    - Respect cultural and social protocols to ensure a positive interaction.

12. Greeting, Thanking, and Appreciating Others:
    - Start conversations with a warm greeting to set a positive tone.
    - Express gratitude and appreciation sincerely and specifically.

SRI SHASHA PRAYATHI TECHNOLOGIES PVT. LTD.

NITK-STEP, Srinivasnagar, Surathkal, Mangalore – 575025

in Collaboration with IETE Vijayawada Centre, Vijayawada

Certificate No.: SSPTIEML078

Certificate

This is to certify that Mr/Ms. Bennada Bindu Madhava Mani Venkat of Godavari Institute of Engineering and Technology has participated in the "Online Internship Programme on Machine Learning with Python" held from 2nd January 2023 to 2nd February 2023 and has satisfactorily completed the course.

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Mr. Yeswanth Pattipathi
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