Acknowledgement

We express our deepest gratitude to our guide **Dr. Dattatreya P. Mankame**, HOD, Department of Computer Science & Business Systems, for their valuable guidance and encouragement while doing this mini project work.

We are indebted to **Dr. Dattatreya P. Mankame**, Head of the Department and **Dr. B G Prasad**, Principal, for their advice and suggestions at various stages of the work.

We also extend our thanks to the management of Dayananda Sagar College of Engineering, Bengaluru, for providing an excellent study environment, reference materials and laboratories facilities. We remain grateful to the co-operation and help rendered by the teaching and non- teaching staff of the department.

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Abstract

The "Solar Angle Calculator" mini-project addresses the critical aspect of optimizing the tilt angle for solar panels to enhance energy generation efficiency. Solar panels play a pivotal role in the renewable energy landscape, and their performance is significantly influenced by their orientation relative to the sun. This project aims to develop a user-friendly Python-based calculator that takes into account latitude, date, and hour angle to determine the optimal tilt angle for solar panels.

The calculator leverages mathematical formulas for solar declination and solar zenith angles to calculate the ideal panel tilt angle. Users input their geographical latitude, the date of interest, and the hour angle, allowing for precise calculations tailored to their location and time. The calculator's output provides a crucial parameter for solar panel installation and maintenance, aiding in the optimization of energy generation and financial returns. This mini-project not only facilitates informed decision-making for solar energy enthusiasts but also contributes to the ongoing pursuit of sustainable and efficient energy solutions.

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