# Analog Circuit Simulator

**Project Plan**

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**Scope and Objectives:**

* **Scope:** This project aims to enhance ANASIM and broaden its functionality to meet the changing requirements of analog circuit design. Test it make it more dependable utilizing the executed design and implementation. This involves analyzing current algorithms and implementing enhancements to improve simulation precision and efficiency.
* **Objectives:**
  + Understanding the project: Perform a thorough analysis of the theoretical framework to identify important concepts, algorithms, and opportunities for improvement. This will lay the foundation for a strategic and informed approach to the rest of the project.
  + Implementation: Leverage understanding of the chosen algorithm to expedite the completion of the implementation.
  + Performance Optimization: After implementing, focus on optimizing performance. Identify algorithm bottlenecks and address computational inefficiencies.
  + Documentation and Training: Initiate documentation efforts alongside implementation and optimization phases to create clear and detailed guidelines for ANASIM's functionalities, capabilities, and usage. Test and review thoroughly to ensure error-free results.

**Tasks and Milestones:**

**1)** **Understanding of System Design** (25%)

A critical first step in the project is the System Design Understanding phase. It entails developing a thorough grasp of the current system, its specifications, and its theoretical foundations.

Subtasks:

Utilise Given Data: Carefully consider the theoretical context and accessible data. This involves going through any transferrable knowledge from the previous team member as well as any paperwork and prior study.

Group discussion: To get a variety of viewpoints and ideas, work closely with the project team, which includes engineers, domain experts, and stakeholders.

Project Protocols: To guarantee adherence to the current project structure, familiarise yourself with project protocols, standards, and any existing project documentation.

By the end of Week 2, this phase should conclude with a comprehensive understanding of the project's theoretical background, existing data, and a clear project direction that has been discussed and documented with the team.

**2)** **Implementation of Core Module (50%)**

Subtasks:

Data Implementation: Create and apply the appropriate data structures and algorithms according to the project requirements and theoretical foundation.

Testing of Different Implementation Techniques: Conduct trials using various implementation methods and approaches to determine the most dependable and effective solutions. This will entail iterative testing and optimization.

By the end of Week 6, the core modules should be implemented, thoroughly tested, and optimized.

**3) Testing Final Product (25%)**

The Testing Final Product phase is the culmination of the project.

Subtasks:

Documentation: Finalize all documentation.

By the end of Week 8, the project should be in its final stages, with all testing, graphics completed, and documentation ready for distribution.

**Scheduling:**

* **Week 1-2:**
  + Team meetings, Project Plan, Planning, solution ideation, task allocation.
* **Week 3:**
  + Implementing cost function with a heuristic algorithm.
* **Week 4:**
  + Implementing circuit components.
* **Week 5:**
  + Working on graphics.
* **Week 6:**
  + Creating a prototype.
* **Week 7-8:**
  + Documentation and testing.

**Resource Allocation:**

* **Software Developers (3):**
  + 60 hours each.
* **Project Manager (1):**
  + 20 hours.

**Cost Estimation:**

Assuming $50 per person-hour:

* **Software Developers (3):**
  + $9000.
* **Project Manager (1):**
  + $1000.

Approx Total Cost: $10,000.

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**Quality Assurance:**

1. **Quality Management Approach**: applying a comprehensive strategy to quality control at every stage of the development lifecycle. The following are some examples of this: proactive risk management, coding standards compliance, and continual enhancement of the process. Also, leveraging state-of-the-art software engineering technologies and methodologies to ensure the efficient and effective development of ANASIM.
2. **Multi Testing Strategy:** Employing a multi-faceted testing strategy, encompassing unit testing, integration testing, and user acceptance testing, to comprehensively evaluate ANASIM's functionality, correctness, and usability.
3. **Reusability:** Designing ANASIM's components in a modular and scalable manner, facilitating reuse and promoting efficiency in future software development endeavors.
4. **Documentation:** Maintain detailed documentation for code, design, and user manuals. Descriptive comments and documentation within the codebase to aid future development and troubleshooting.
5. **User Feedback:** Regular feedback sessions with clients. An iterative feedback loop enhances the user experience, ensuring that ANASIM aligns closely with the requirements of its intended users.

**Risk Management:**

* Risk management is essential for the ANASIM project to proactively identify and solve possible issues that can occur during development. The project timeframe may be affected by potential implementation delays for data. In order to reduce this risk, more time has been scheduled expressly for making sure that any unanticipated issues may be resolved without jeopardising project timelines. We'll undertake regular risk assessments to identify emerging risks and revise our mitigation plans as necessary.

**Communication Plan:**

1. **Weekly Team Meetings:**
   * Holding weekly team meetings to discuss project status, provide updates, and solve problems, fostering agreement on project objectives. Ensure team members are informed, aligned, and engaged, fostering a sense of collective ownership and accountability.
2. **Bi-weekly Stakeholder Updates:**
   * Providing bi-weekly updates to stakeholders to keep them informed about project developments, milestones achieved, and any emerging issues. This ensures transparency and allows stakeholders to provide timely feedback.

**Project Monitoring and Control:**

1. **Regular Progress Reports and Updates:**

* The project manager assigned will keep track of milestones and key performance indicators to provide regular progress reports and updates on job accomplishments and potential hazards.

1. **Adjust Schedule and Resources as Needed:**
   * Continuously monitoring project activities and, if necessary, adjusting schedules and allocating resources based on ongoing assessments. This adaptive approach allows for flexibility in response to changing project dynamics.
   * The project manager assigned will ensure that the project remains on track and aligned with its objectives, promptly addressing any deviations or emerging requirements.

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