Design Document

Overview & Grading Rubric

This document contains two sections: the first section provides a description and how to produce a well-written Design Document. The second section describes the grading rubrics used to assess your learning and provide formative feedback.

# Overview

## Description

In the documentation flow, the design document comes in after the requirements document and before the plan document. It explains your data model, the component APIs, and the overall architecture of the system to be built to satisfy the requirements. In scientific projects, it explains the experimental design to evaluate the hypothesis.

## How to produce a well-written deliverable

Make sure your writing is brief and easy to understand. Each section should follow the guidelines as outlined in the template. In addition, you should structure the paragraphs and build effective connections between them. By setting out your ideas and arguments with a natural flow, you will increase the readability of your work.

# Grading Rubric

## Introduction (3 points)

* The introduction reintroduces the summary of the real-world problem your project addresses
* The introduction includes a brief summary of the main design decision
* Is there "too much" technical terminology?
  + Example of possible point deduction: introduction contains excessive mathematical equations or technical terminology with overwhelming information
* Are points explained concisely and not dragged on?
* The introduction should not exceed two paragraphs in length

## Design Considerations (5 points)

* Indication of assumptions, such as assumptions about data, assumptions about nature of the solution, etc.
* Indication of things that the project is constrained by
* Indication of the system environment how and where the model is going to run
* Indication of the design methodology, i.e., a breakdown and description of the system
* Indication of the association with the requirements specified in the requirements document

## System Architecture/Design Overview (5 points)

* A design or architecture diagram is included
* Both high-level and low-level components are included in the diagrams

## Data Design (3 points)

* Descriptions (format, object, etc.) of the data used are provided
* Data structure is included

## Implementation Overview (5 points)

* An overall workflow diagram (domain model, dataflow, component design, interface design, activity/entity/class/sequence diagram) is included
* The overall workflow diagram is of appropriate choice

## Design Models (2 points)

* The section contains detailed explanations of all the diagrams in the previous section
* The design models are relevant to the type of project (e.g., object model, dataflow model, feature engineering, machine learning training, testing setup, integrated additional/external data/services, etc.)

## Test Design (3 points)

* The section contains detailed explanations of the procedure to test the model, metrics, data scheme of the results
* Results are properly presented in a result table

## Deployment Model (2 points)

* The section outlines the eventual deployment strategies of the project

## Risk/Challenges (4 points)

* The section lists (domain, technical, and business) anticipated risks and challenges of the project
* A minimum number of 3 relevant risks should be identified
* All risks mentioned must be explained in detail

## Tools & Dependencies (2 points)

* All existing libraries, datasets, services, or other resources the system depends on are listed
* Versions of libraries, Python/Java, etc. are included
* The rationale for why used such tools/dependencies and versions are included

## Terminology, Definitions, Acronyms, and Abbreviations (3 points)

* The definitions of the non-functional requirements are detailed in this section
* Necessary definitions, acronyms, and abbreviations are included
* Definitions of technical terminologies are included

## References (3 points)

* All in-text citations are referenced in this section
* All citations include respective URLs
* The format of individual references are consistent throughout
* References follow the IEEE standards

## Reflection (3 points)

* A brief reflection or lessons learned from completing this document is included
* The reflection expresses the decision-making process

## Appendix (0 points)

* Additional information for context is mentioned
* Glossary for terms (common-sense, real-world) is included
* Long diagrams, data schemes, etc. are included in this section (if applicable)

## Changes To Previous Deliverables (2 points)

* The section outlines any changes made to the Vision Document and Requirements Document due to the activities conducted during the making of the Plan and Design Documents

## Writing, Style, and Formatting (5 points)

* The document is free of spelling errors
* Proper sub-heading style is used if the document contains subsections
* Auxiliary information, such as URLs, reference numbers, or external documentation are included in footnotes; lengthy supplemental information is included in the appendix
* The written work is brief and easy to understand without unnecessarily long statements and paragraphs
* The document should be versioned (e.g., V1 Vision Statement) with proper use of major and minor versions
* A changelog at the top of the document is included
* Citations take the proper form and are properly inserted in the text
* Diagrams are properly formatted for readability
* Legends for all diagrams are included