# Design Document

## Introduction

The Goal of this Project is to create an ANN (Artificial Neural Network) to predict outcomes of … (…)

## Architecture

The Program should read in Result Data. The Dataset (created by […]) will be split into three different Data sets. One Dataset will be the Training set, another the Validation and the Third will be used for Test-Validation to make sure the ANN is predicting Results which are close enough to the Expected Outcome.

## Interface Design

The Python Project will probably end up without a GUI. (may be added later on). For now the Program will read in datasets given as a Command Prompt or as a Hardcoded Variable. After loading, the data will be randomly selected into three groups. (as described above).

In the Training Class, the Training Data will be used to create an ANN to predict […].

Afterwards the created ANN Model will be sent over to the Validation and Testing Class.   
Here the ANN model will be tested if the predicted Results are close enough. In here We will also end up tweaking some Hidden Layers to actually get us closer results if necessary. Afterwards we will run the Test Data set again, to make sure we get close results. In the End we will be using the Third dataset (new data not included in the Training or validation set) to make sure that the whole goal of the Project is achieved. If not, we’ll have to tweak again , or find bugs in the code.

## System Functionality

Read in Data, Create ANN model, validate if it’s good enough, export it for further usage with completely different elements.

## Error Handling

In the code there will be clear error Messages to trace back to a possible mistake. Like, File not Found or out of bounds.

Since we’re planning to use Python, we will either Raise a flag and possibly use the assert functionality, to find error easier and to tell the User what’s wrong with the dataset or the program.

## Performance Considerations

Aiming for quick runtimes. Without having to wait for 10 Hours before we get an result, while also aiming to use the model on “any” device. Not only Next-Generation devices.

## Conclusion

[…]

## Testing Documentation

Testing will purely happen within the program by using the Test + Validation functionality. We’re aiming to get good results in the Final ANN. And tweaking Hidden Layers etc. will be done within the Testing Steps.

Possibly automatic, by running / creating multiple models. To see how different Results will interfere with the expected vs. calculated Results. Therefore we’re planning on splitting the collected Data into multiple sets to make sure that we’re not testing with Trained Data.

## Test Data

Will be part of the Collected Dataset. To make sure that the Testing Data is accurate. Therefore we can guarantee that the final Model ay hopefully be as close to the actual results as possible.

## Test Validation

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## Test Results

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## Conclusion