SYNOPSIS

Maintaining Software Quality in products is a major challenge for software developers. Software defects are the prime factors affecting the quality of a software product. Even though, system testing reveals a number of defects in the product, predicting the number of latent defects are the prime concern of software developers. A measure of such defects in software is ‘software defect density’, which is a measure of the number of defects per unit of software. The meaning of the term unit may differ and ranges from a function to a complete software. In this thesis, approaches have been proposed that model the relationship between some quality metrics and software defect density.

In the thesis, work has been carried out to identify the impact of module size on the software defect density. Various models have been proposed that reflect the change in defect density with changes in software product metrics. These models are also validated against the appropriate data sets.

The goal of the thesis is to identify the prediction performance of different software product metrics on software defect density for in-house as well as open source software. The objectives of the thesis can be stated as follows:

To find the different relationships between software defect density and module size of the software.

To propose a product metrics suite that offers relatively lower defect density in comparison to static software code metrics.

These objectives form the five different chapters of this thesis. The models proposed in these chapters are validated against real life data set and are found to be effective in enhancing the overall quality of the software.