

## ABSTRACT

Many software reliability models have been proposed in the past decade for assessing the reliability of a software system, and most of these models are related to software systems of complex and large functions.

The aim of this research is to design a new model which is based on the assumption that a "program is a collection of one or more modules". This model estimates the reliability of small and large programs and it can be determined if the failures occur in the modules or in the connection parts between these modules. The large programs are decomposed into several modules depending on the analytical techniques which include: series, parallel, and series-parallel classification. The reliability of each module is estimated by using the proposed model, and the reliability average of these modules is calculated according to the technique that has been used in decomposing the programs. Then, the reliability of the whole program before decomposition is estimated by using the same proposed model.

Finally the two reliabilities that have been obtained by the two methods (decomposition and without decomposition) are compared to see if the failures occur in the connection parts between modules or in the modules themselves.