In this thesis, we have constructed some new codes and programs in computer algebra system named as Macaulay 2. The construction of these codes is much helpful in solving the critical algebraic problems.

We introduced how to implement algorithms in Macaulay 2 for studying and using monomial ideals and how we can do algebraic computations through coding in Macaulay 2.

We have given the interpretation to the structure of Macaulay 2 commands and data types. We followed the theory of simplicial complexes and their related properties, and we constructed their codes in Macaulay 2 which leads us to develop the new program with the latest version of Macaulay 2 for the computation of f-ideals generated in degree up to n. We have given interpretation of f-ideal with the help of facet and non-face complexes. Also constructed some other codes for the computation of f-ideals.