AN INTRODUCTION TO SURGERY THEORY

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As an general tool of studying high dimensional topology, surgery method help to answer if a homotopy equivalence of manifolds is homotopic to a diffeomorphism. Starting with a Poincaré complex X (dim≥ 5), the first obstruction to the existence of a smooth (or PL) manifold in this homotopy type is if the Spivak normal fibration of X admits a vector (or PL) bundle reduction, having a degree 1 normal map then, one can easily do surgery to make the map connected below the middle dimension, the second obstruction to complete the surgery lives in the algebraic L-groups. Some homotopy theory of the surgery classifying spaces will be mentioned, and some localized surgery theory will be introduced after the ordinary one.