A new approach to the dyeing of cotton fabrics using an electrostatic self-assembly method was evaluated. Cotton fabrics were pretreated with 2,3-epoxypropyltrimethylammonium chloride and cationic charges were produced on the fabric surfaces. For the dyeing of cotton fabric, reactive and acid dyes were used. Oppositely charged anionic reactive/acid dyes and cationic poly(diallyldimethylammonium chloride) were alternately deposited on the surface of cationised cotton fabrics. Ten multilayer films of dye/poly(diallyldimethylammonium chloride) were deposited on the cotton fabric surfaces using a padder. The build-up of the multilayer films and the level of colour strength (K/S) achieved are discussed. Samples of cotton fabrics were also dyed with the same dyes, but using the exhaust method, and both types of dyed samples were compared. The washing, rubbing and light fastness properties were evaluated for the dyed fabrics.