A spectral collocation method is used to solve Volterra or Fredholm equations with weakly singular kernels and corresponding integral-differential equations by virtue of some identities. For a class of functions that satisfy a regularity condition (R): $\|y^{(k)}\|_{L^\infty[0,T]} \leq c_k R^{-k}$ (condition (M): $\|y^{(k)}\|_{L^\infty[0,T]} \leq cM^k$) on a bounded domain, we obtain a geometric (supergeometric) convergence rate in the $L_\infty$ norm as well as a weighted $L^2$ norm for both types of equations. Numerical results confirm our theoretical analysis. (Received September 22, 2010)