Abstract. In this paper, we study the stability in the Lyapunov sense of the equilibrium solutions of discrete or difference Hamiltonian systems in the plane. First, we perform a detailed study of linear Hamiltonian systems as a function of the parameters, in particular we analyze the regular and the degenerate cases. Next, we give a detailed study of the normal form associated with the linear Hamiltonian system. At the same time we obtain the conditions under which we can get stability (in linear approximation) of the equilibrium solution, classifying all the possible phase diagrams as a function of the parameters. After that, we study the stability of the equilibrium solutions of the first order difference system in the plane associated to mechanical Hamiltonian system and Hamiltonian system defined by cubic polynomials. Finally, important differences with the continuous case are pointed out.