This thesis concerns continued fractions of quadratic irrationals. Their basic properties are shown, including mentioning necessary theory to do this. Then, this theory is used to find the form of continued fractions of square roots of positive nonsquare integers and their symmetric part $(a_1, \ldots, a_k)$. Next, for a given symmetric sequence of positive integers $(a_1, \ldots, a_k)$, we find all natural numbers N, whose square root has a continued fraction with symmetric part $(a_1, \ldots, a_k)$. These positive N will be described as values of a certain quadratic polynomial, whose properties are studied as well in the thesis.