We show the use of the theory of Lie algebras, especially their oscillator realizations, in the context of quantum mechanics. One can construct oscillator realizations from matrix realizations. In the case of symplectic and special orthogonal algebra, we demonstrate an alternative method of obtaining oscillator realizations from symmetric or exterior power of a vector space of annihilation and creation bosonic or fermionic operators. We find Lie algebra of polynomials of degree at most two in phase space of a mechanical system, which form the semi-direct product of the Heisenberg algebra and symplectic algebra. It is shown that a classical system with Hamiltonian function in this algebra can be quantized by two equivalent representations - Schrödinger or Bargmann-Fock representation. The second mentioned representation generates the same operators of symplectic algebra as we got from their previous formal construction from symmetric power of a vector space of bosonic operators. Quantization is demonstrated on the bosonic harmonic oscillator. We use the similarities between bosonic and fermionic oscillator realizations to define the fermionic harmonic oscillator. Some properties of spinor representations of special orthogonal algebra are illustrated on its state space.