The Neumann conditionis a type of boundary condition commonly used in the study of partial differential equations (PDEs)。It specifies the values of the normal derivative of a solution on the boundary of the domain，rather than the solution itself (as in the Dirichlet condition)。

For a PDE defined on a domain $\Omega$ with boundary $\partial\Omega$, the Neumann condition is given by：

$$\frac{\partial u}{\partial n} = g \quad \text{on} \quad \partial\Omega \quad \frac{\partial u}{\partial n} = \nabla u \cdot n$$

Example heat equation in 1D

$$\frac{\partial u}{\partial t} = \alpha \frac{\partial^2 u}{\partial x^2} \quad x \in [0, L] \quad \text{with Neumann boundary condition at x=0，}$$

$$\frac{\partial u}{\partial x}(0,t) = q(t)$$