Consider the circuit above, where the o/p from a signal source is measured to be 100mV. If the signal source is connected to $V_{IN}$ of the amplifier with gain of 100, expected value at amplifier output $V_{OUT}$ will be $(100 \times 100 \text{mV}) = 10V$. Since the gain of the Amplifier should be independent of the load, we will also expect $V_{OUT}$ to remain at 10V, with or without the load connected.

Now consider the following situation where we have included the actual thevenin equivalent models of all the blocks concerned, where $Z_S$, $Z_I$ and $Z_O$ and $Z_L$ are the equivalent input and output impedance of each respective block.

From this diagram it is obvious that the actual $V_{IN}$ value will depend on the ratio of $Z_I$ & $Z_S$, while $V_{OUT}$ will depend on the ratio of $Z_L$ & $Z_O$ in addition to value of $V_{IN}$.

To reduce this 'loading' effect at $V_{IN}$ and $V_{OUT}$, we usually try to mismatch the values of $Z_I$ & $Z_S$ (i.e. make $Z_I \gg Z_S$), as well as values of $Z_O$ & $Z_L$ (make $Z_O \ll Z_L$).

In practice, we will try to design an amplifier such that its $Z_I$ is as high as possible (ideally $\infty$), and its output impedance $Z_O$ is as low as possible (ideally 0) to minimise the loading effect.