Step-1

Let us consider the problem in which we need to maximize the cost instead of minimization.

It gives, $Ax = b$ and $x \leq 0$

The stopping condition in this case will be the reverse of the stopping condition in minimization.

Thus, the stopping condition would be $\boxed{r \leq 0}$.

Step-2

Now, if this condition fails, and the i^{th} component is the largest, then that column of N will enters the basis.

Suppose x_i is the entering variable and u is column I of N.

At new corner: $$x_i = \text{smallest ratio } \frac{\left(B^{-1}b\right)_j}{\left(B^{-1}u\right)_j} = \frac{\left(B^{-1}b\right)_k}{\left(B^{-1}u\right)_k}$$

Therefore, the k^{th} column of the old B leaves the basis and the new column u enters.