- Through QR-factorization system $\boldsymbol{Ax} = \boldsymbol{b}$ is reduced to $\boldsymbol{Rx} = \boldsymbol{y}$, with $\boldsymbol{R} \in \mathbb{C}^{m \times m}$ upper triangular. The solution is found by backward substitution

```
for i = m downto 1
  x_i = y_i / r_ii
  for j = 1 to i - 1
    y_j = y_j - r_ij x_i
```

- Backward substitution is backward stable

Theorem. *For $\boldsymbol{R} \in \mathbb{C}^{m \times m}$ upper triangular, $\boldsymbol{y} \in \mathbb{C}^m$, there exists $\delta \boldsymbol{R}$ with $\|\delta \boldsymbol{R}\| / \|\boldsymbol{R}\| = \mathcal{O}(\epsilon_{\text{mach}})$such that the approximate result $\tilde{\boldsymbol{x}}$ given by the backward substitution algorithm $(\boldsymbol{R}, \boldsymbol{y}) \rightarrow^{\tilde{f}} \tilde{\boldsymbol{x}}$ satisfies $(\boldsymbol{R} + \delta \boldsymbol{R})\tilde{\boldsymbol{x}} = \boldsymbol{y}$.*

- Since Householder QR-factorization and backward substitution are both backward stable, solving $\boldsymbol{Ax} = \boldsymbol{b}$ through these two methods is also backward stable