Gradient Descent (fixed step size)

input : starting point $\vec{x}_0$, step size α, tolerance E_s
output: $\vec{x}^*$, estimate of a local minimizer

$k \leftarrow 0$
while $\|\nabla f(\vec{x}_k)\| > E_s$ **do**
  $\vec{x}_{k+1} \leftarrow \vec{x}_k - \alpha \nabla f(\vec{x}_k)$ `// step downhill`
  $k \leftarrow k + 1$
end
return $\vec{x}^* = \vec{x}_k$