# Detailed Algorithm

## Training Procedure

**1** Sample minibatch of m noise samples $\{z^{(1)}...z^{(m)}\}$

**2** Sample minibatch of m real samples $\{x^{(1)}...x^{(m)}\}$

**3** Update Discriminator by ascending gradient:

$$\nabla_{\theta_d} [1/m \ \Sigma \ (\log D(x^{(i)}) + \log(1-D(G(z^{(i)}))))]$$

### Switch to Generator

**4** Sample new minibatch of noise samples

**5** Update Generator by descending gradient:

$$\nabla_{\theta_g} [1/m \ \Sigma \ \log(1-D(G(z^{(i)})))]$$

## Update Strategy

**D** Ascending gradient (maximize)

**G** Descending gradient (minimize)

## Notation

| | |
|---|---|
| $m$ | Minibatch size |
| $z$ | Noise vector |
| $x$ | Real sample |
| $\theta_d$ | D parameters |
| $\theta_g$ | G parameters |

**6** Repeat until convergence

Iterate Until Equilibrium