""" Automatic Differentiation ========== Following tutorial
compile this to pdf with pandoc if you want """

from **future** import print_function import torch

x = torch.ones(2, 2, requires_grad = True, dtype = torch.float) y = x + 2 z = y * y * 3

v = torch.tensor([1,2], dtype = torch.float) # out = torch.mm(v.T, z) out = v@z@v out2 = torch.matmul(v,z) out2 = torch.matmul(out2, v) # out = z.mean() out.backward()

$$out = \sum_{i,j} v_i v_j ((x_{i,j} + 2)(x_{i,j} + 2) * 3)$$

$$d(out)/dx_{1,1} = ... = 3 * v_1 * v_1 * 2 * (x_{1,1} + 2) = 18$$

print(x) print(y) print(z) print(v) print(out) print(out2) print(x.grad)