get\_gtheta = function(theta)

{

x1 = theta[1]

x2 = theta[2]

g\_theta = c(-200\*(x2-x1)-2\*(1-x1),200\*(x2-x1))

}

theta=c(-10, 10)

print(get\_gtheta(theta))

# relate to Newton-Raphson presentation

get\_H=function(theta)

{

H = matrix(data = c(202,-200,-200,200), nrow = 2, ncol = 2, byrow = TRUE)

}

print(get\_H(theta))

for(i in 1:10)

{

print(theta)

quad = get\_H(theta)

print(quad)

grad = get\_gtheta(theta)

print(grad)

if(max(abs(grad)) < 0.000001)

break

delta = solve(quad, -grad)

print(delta)

theta = theta+delta

}

print(theta)

**Output**

**[1] -10 10**

**[,1] [,2]**

**[1,] 202 -200**

**[2,] -200 200**

**[1] -4022 4000**

**[1] 11 -9**

**[1] 1 1**

**[,1] [,2]**

**[1,] 202 -200**

**[2,] -200 200**

**[1] 2.842171e-14 0.000000e+00**

**>**

**> print(theta)**

**[1] 1 1**