**Question 1**

1. hθ(x) = θᵀx
2. J(θ) = 1/m \* sum(-y \* log(hθ(x)) – (1 – y) \* log(1 – hθ(x)))
3. Gradient = 1/m \* sum(hθ(x) – y) \* x
4. Theta = theta – alpha \* gradient = theta – alpha \* 1/m \* sum(hθ(x) – y) \* x
5. -

**Question 2**

Univariate linear regression:

hθ(x) = θ₀ + θ₁x

J(θ) = 1/2m \* sum((hθ(x) – y) ^ 2)

Gradient θ₁ = θ₁ - alpha \* 1/m \* sum(hθ(x) – y) \* x

Minimize J(θ)

Derivative(J(θ)) = 1/m \* sum(hθ(x) – y) \* x

1/m \* sum(θ₀ + θ₁x – y) \* x = 0

sum(θ₀ + θ₁x – y) = 0 ∨ x = 0

θ₀ \* m + θ₁ \* sum(x) – sum(y) = 0

θ₁ \* sum(x) = sum(y) – θ₀ \* m

θ₁ = (sum(y) – θ₀ \* m) / sum(x)