# PRP ASSIGNMENT W4

**Given:**

* Classes: ω₁ = Disease, ω₂ = No Disease
* Posterior probabilities: P(ω₁ | x) = 0.2, P(ω₂ | x) = 0.8
* Losses:
  + λ(Treat | Disease) = 0
  + λ(Treat | No Disease) = 20
  + λ(No Treat | Disease) = 100
  + λ(No Treat | No Disease) = 0

**Step 1: Conditional risk for action “Treat” (α₁)**

The conditional risk formula is:

Substitute the values:

**Step 2: Conditional risk for action “No Treat” (α₂)**

**Step 3: Optimal decision**

Compare the risks:

* R(Treat | x) = 16
* R(No Treat | x) = 20

The lower risk is 16, so the optimal decision is to **Treat** the patient.