**NAME : MANGESH A. GHADWAJE**

**ROLL NO:24**

**BATCH : B2**

**COURSE: DATA SCIENCE PRACTICAL**

**Assginment No. 1**

**Code :**

**def bayes\_theorem(p\_b\_given\_a, p\_a, p\_b):**

**"""**

**Calculate the posterior probability P(A|B) using Bayes' theorem.**

**:param p\_b\_given\_a: P(B|A) - The probability of B given A**

**:param p\_a: P(A) - The prior probability of A**

**:param p\_b: P(B) - The probability of B**

**:return: P(A|B) - The posterior probability of A given B**

**"""**

**# Calculate the posterior probability P(A|B)**

**p\_a\_given\_b = (p\_b\_given\_a \* p\_a) / p\_b**

**return p\_a\_given\_b**

**# Example input values**

**p\_b\_given\_a = 0.8 # Probability of B given A**

**p\_a = 0.4 # Prior probability of A**

**p\_b = 0.5 # Probability of B**

**# Compute the posterior probability**

**posterior\_probability = bayes\_theorem(p\_b\_given\_a, p\_a, p\_b)**

**print(f"P(A|B) = {posterior\_probability:.4f}")**

**OUTPUT:**

