**Problem Statement:** Addition of two large vectors

**Code:**

**Command to install nvidia gpu on google colab:** !nvidia-smi

import cupy as cp

import numpy as np

import time

# Size of large vectors

N = 10000000

# Create large vectors on CPU

a\_cpu = np.random.rand(N).astype(np.float32)

b\_cpu = np.random.rand(N).astype(np.float32)

# ---------- CPU ----------

start\_cpu = time.time()

c\_cpu = a\_cpu + b\_cpu

end\_cpu = time.time()

print(f"CPU Vector Addition Time: {end\_cpu - start\_cpu:.4f} seconds")

# ---------- GPU ----------

a\_gpu = cp.asarray(a\_cpu)

b\_gpu = cp.asarray(b\_cpu)

start\_gpu = time.time()

c\_gpu = a\_gpu + b\_gpu

cp.cuda.Device(0).synchronize()  # Ensure GPU is done

end\_gpu = time.time()

print(f"GPU Vector Addition Time: {end\_gpu - start\_gpu:.4f} seconds")

**Command to run the shells in google colab:**

Shift enter

**Output:**  
CPU Vector Addition Time: 0.0169 seconds

GPU Vector Addition Time: 0.0039 seconds