Task 08 – Split the work

Take again the daxpy code for vector sum.

1) Instead of using a single for to add all the elements of the vectors, split the work in chunks:

   Before:

   FOR i = 1 TO n:

   d[i] = a*x[i] + y[i]

   END FOR

   Now (this is pseudocode it may contains errors, be careful during implementation):

   n = 100 // Total vector elements

   chunk_size = 8

   // 1. Calculate the number of chunks

   // Ensure you use a ceiling function if n is not perfectly divisible

   number_of_chunks = CEILING(n / chunk_size)

   // 2. Outer loop iterates through chunk indices (0 to number_of_chunks - 1)

   FOR chunk_index = 0 TO number_of_chunks - 1:

   // 3. Calculate start and end for the current chunk

   current_start = chunk_index * chunk_size + 1

   current_end = (chunk_index + 1) * chunk_size

   // Adjust current_end for the last chunk if it's smaller

   IF current_end > n:

   current_end = n

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    END IF

    // Alternative calculation for current_end (often simpler to reason about?):
    // current_end = MIN( (chunk_index * chunk_size + 1) + chunk_size - 1, n )
    // current_end = MIN( current_start + chunk_size - 1, n)

    // 4. Inner loop processes items within the current chunk
    FOR i = current_start TO current_end:
      // Your actual processing logic for 'i' goes here
      d[i] = a*x[i] + y[i]
    END FOR
  END FOR
```

➔ Check that d is the same as the original code.

2) For every chunk calculate the sum of the elements in the chunk and place into array partial_chunck_sum, then sum all the elements in partial_chunck_sum.

   ➔ Check that this last sum is the same as the sum of all the elements of d in the original code.