Name: Hasanat Jahan
CS381-16 Assignment 1

Answer to 1.1
Here the variable core_num would refer to the numbers of the core, such as 0, 1, 2...
remaining = n % p
# when n is not evenly divisible by p
if core_num < remaining then:
      my_first = core_num * n/p
      my_last = my_first + n/p

# when n is evenly divisible by p
else:
      my_first = core_num * n/p
      my_last = my_first + n/p - 1
      # there is a - 1 to account for the even split
      # for example, n = 20, p = 5
      # we have an equal split of 4 data points each core
      # core 0: 0-3 data points
      # core 1: 4-7 data points ...

Answer to 1.2
Pseudocode for sum:

```
divisor = 2
core_difference = 1
sum = current_core_val
while divisor <= num_of_cores:
    if core_num % divisor == 0:
        val = receive value from sending core
        sum += val
    else
        sending_core = core_num + core_difference
        send value to sending_core
divisor *= 2
core_difference *= 2
```

<u>Answer to 1.4</u>

```
divisor = 2
core_difference = 1
sum = current_core_val
while divisor <= num_of_cores:
    if core_num % divisor == 0:
        val = receive value from sending core
        sum += val
    else
        sending_core = core_num + core_difference
        send value to sending_core
divisor *= 2
core_difference = core_difference << 1
```