

COEN 11 - Practice VIII

Solutions on Wednesday

1. Give an example of a situation in which using different threads for different tasks would be helpful.
2. Splitting the work -- calculate the value of π using N threads:
$$\pi = 4 (1 - 1/3 + 1/5 - 1/7 + \dots + (-1)^n 1/(2n+1))$$

Algorithm:

```
double factor=1.0;
double sum=0.0;
for (i = 0; i < n; i++, factor = -factor)
    sum += factor / (2*i + 1);
pi=4*sum;
```

3. Splitting the data -- write a thread function to initialize int array x so that each element receives its index in the array: $x[i] = i$, and each thread initializes its portion of the array. Note that i relates to the entire array. The size of the array is N , and your program will execute with $nthreads$ (which is a global value). Each thread receives an id between 0 and $nthreads-1$. Assume N is a multiple of $nthreads$.
4. Splitting the data -- write a thread function to initialize int 2D array x ($N \times N$) so that each thread initializes its portion with $i+j$ in each slot. Note that i and j relate to the entire array. Each thread operates on a strip independently, and your program will execute with $nthreads$ (which is a global value). Each thread receives an id between 0 and $nthreads-1$. Assume N is a multiple of $nthreads$.