

HW #1

Problem 1 (10 points) Write a program for the following ring-type communication:

- process 0 reads x from keyboard and sends it to process 1.
- process 1 increments x by its rank (=1) and sends it to process 2.
- in general process i receives x from process $i - 1$, increments x by i , then sends it to process $i + 1$.
- process 0 receives x from process $np - 1$
- each process prints on the screen its rank and the value of x that it holds

Provide:

1. A listing of your code.
2. Sample output for input $x = 1$ when run on 16 processors.

Problem 2 (15 points) Implement in parallel the composite Simpson's rule:

$$h = (b - a)/n, n \text{ even number}$$

$$x_i = a + i * h, i = 0, 1, \dots, n$$

$$\int_a^b f(x) dx \approx \frac{h}{3} \left[f(a) + 2 \sum_{i=1}^{(n/2)-1} f(x_{2i}) + 4 \sum_{i=1}^{n/2} f(x_{2i-1}) + f(b) \right] \quad (1)$$

Provide:

1. A listing of your code.
2. Test run: evaluate π using $n = 10000$ on 10 processors.