

Parallel programming

MPI Interface

07 - Gap between consecutive prime numbers

The gap between consecutive prime numbers 2 and 3 is only 1, while the gap between consecutive primes 7 and 11 is 4. Write a parallel program to determine, for all integers less than 1,000,000, the largest gap between a pair of consecutive prime numbers.

MPI_Probe

- Blocking test for a message
- `int MPI_Probe(int source, int tag, MPI_Comm comm, MPI_Status *status)`
 - `source` – source value or `MPI_ANY_SOURCE`
 - `tag` – tag value or `MPI_ANY_TAG`
 - `comm` – communicator
 - `status` – Status object
- `MPI_Status` structure:
 - `MPI_Source` – id of processor sending message
 - `MPI_Tag` – message tag
 - `MPI_Error` – error status
- `int MPI_Get_count(MPI_Status *status, MPI_Datatype datatype, int *count)`
- Example:
 - `MPI_Get_count(&status, MPI_INT, &size);`
 - `size = status.size;`

08 - Zeleni brojevi

Broj je **zelen** ako je prost i ako mu je zbir cifara prost broj. Napisati paralelani program koji nalazi sve zelene brojeve od 1 do A (učitava root proces). Sve pronađene zelene brojeve upisati u fajl greensOut.dat sortirane od najmanjeg ka najvećem (o upisivanju u fajl takođe brine root proces). Optimizovati program da se u što kraćem roku izvrši.

- primeri zelenih brojeva: 2, 3, 5, 7, 11($1+1=2$ - prost), 41($1+4=5$ - prost)...