

Programming Assignment for *Crash Course in Supercomputing* by Rebecca Hartman-Baker

Assignment: Write a parallel program that will compute π using the Method of Darts.

Rules:

1. This program should be written in C or C++ using the MPI libraries and run on a supercomputer.
2. Write at least three source code files: one containing the `main()` function, one containing the manager function, and one containing the worker function. Here are skeletons for `main.c` (C language) or `main.cc` (C++ language):

main.c	main.cc
<pre>#include <stdlib.h> #include <stdio.h> #include <mpi.h> #include "pi_headers.h" int main(int argc, char **argv) { int me; long ndarts = 100000000; double pie; MPI_Init(&argc, &argv); MPI_Comm_rank(MPI_COMM_WORLD, &me); if (me == 0) /* manager */ { pie = pi_manager(); printf("for %ld darts, pi = %g\n", ndarts, pie); } else /* worker process */ { pi_worker(); } MPI_Finalize(); return 0; }</pre>	<pre>#include <iostream> #include <mpi.h> #include "pi_headers.h" int main(int argc, char **argv) { int me; long ndarts = 100000000; double pie; MPI::Init(argc, argv); me = MPI::COMM_WORLD.Get_rank(); if (me == 0) /* manager */ { pie = pi_manager(); std::cout << "for " << ndarts << " darts, pi = " << pie << std::endl; } else /* worker process */ { pi_worker(); } MPI::Finalize(); return 0; }</pre>

3. Write a Makefile that will compile your program on your supercomputer.
4. Write a batch script to run your program (if your computer requires it).
5. Run your program on a supercomputer, using at least four processors, and make sure that it works!
6. If you have any questions, please ask your mentor (if applicable) or a knowledgeable friend first, but if that doesn't work, ask me (hartmanbakrj@ornl.gov).