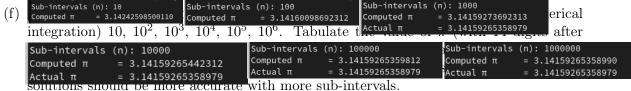
## Project #5: Computing $\pi$ Numerically

Submit your program and results via email.

- 2. Task 2: parallelize your sequential code using MPI.
  - (a) Put together the code pieces in my slides to compute the value of  $\pi$  in parallel using MPI. Requirements:
  - (b) Understand the usage of the four must-have MPI functions in the code.
  - (c) Understand the usage of MPI\_Bcast and MPI\_Reduce.
  - (d) Compile the code using mpicc. Make sure your code compiles.
  - (e) Try to run the code using mpirun. Make sure your code runs.



| Sub-intervals (n): 1000000 | Sub-intervals

(h) Use the same  $n=10^6$  with different number of processes (np = 1, 2, 3, 4). Use MPI\_Wtime to obtain the time cost of your program. The MPI\_Wtime function should not include the I/O statements. Draw a speed-up curve similar to the one in my slides.

