Assignment #2 – PI by Tylor Series

1. (40p) Write a multithreaded code in C that computes the pi number using Taylor series as shown in Eq1. Each compute-node will compute the part of the Pi number. Shortly you should decide on the decomposition of the following task.

   Pi= 4 × (+1/1 - 1/3 + 1/5 - 1/7 + 1/9 -...) **Eq1.**

2. (5p) Your solution should ask the total number of operations (**total of a sum and subtract operations**) at the beginning of the execution (in the master process). Do not use a static number.

3. (5p) The number of compute nodes (threads) will be dynamic. It will be asked from the user during the execution.

4. (20p) You must send a **number or a range** to the compute nodes. The compute nodes should provide their partial result for the master. Since this project uses multi-threads, compute nodes are all local. You can develop your application on a single machine having multiple cores. The number of threads will be increased by 1. It will be in the range from 1 to 64.

1. (30p) You need to provide a report for this project. In your report you should report a figure representing **computation time vs number of threads** for 1.000.000 add/sub operations. Note that one addition and one subtraction counted as two operation (e.g. +1/1 - 1/3). So there will be 500.000 add/sub operation for the figure. Provide your source code and report including:
   a. A cover page
   b. Problem & Your solution strategy
   c. Data visualizations (Figures) for the results.
   d. Approximation error and duration of the computation
   e. Conclusion