HomeWork II

Naifan Gao

Sep. 20, 2017

Test system: Mac os;
Test tools: XCode, Cmake;
Test examples' code are all in ~/02_Naifan_Gao/src;
Answer:

1) A. The program is in assignment_02_01.cpp
   B. Termination condition I use is (f(x) = cos(x) < 0 && error >1e-5)
   C. As setting the solution to be a float type, the program will run for an infinite time and always in the loop. Because as using this function with this data type, it can never reach the real solution.
2) A. I use while loop in the float calculation, for loop in the double calculate;
   B. As float can only precise to 7 decimal number, I set the maximum number of digits as 7. For the same reason, I set double with 15.
   C. For the precision of float, there is some error between the calculated float number and real PI.
3) D. From the output, I think the value of ex based on the power series expansion converges faster. However, at the same time, power series expansion has higher complexity, which means $(1 + \frac{x}{n})^n$ has lower complexity. Because if x & n is given, this equation only needs one calculation loop, but power series expansion needs n loops.