Lab 2 Linear System

CS 535 Numerical Computation

Date:10/10/18 Name: Waled Salem Coyote ID:004893625

I Problem Statement and Goals

Write a program to compute absolute and relative error’s in Stirlings approximation.

II Methods, Algorithms, Tools used

Factorial

Stirling’s Approximation

Absolute and Relative Error

III Program (provide detailed codes for each question if any)

1.

abs\_err = zeros(1,10);

rel\_err = zeros(1,10);

for n = 1:10

p = gamma(n+1);

stirling = sqrt(2\*pi\*n)\*(n/exp(1))^n;

error = stirling – p;

rel\_err(1,n) = error;

error = error/p;

abs\_err(1,n) = error;

end

rel\_err

abs\_err

IV Results (provide detailed analysis and results for each question)

rel\_err =

1.0e+04 \*

-0.0000 -0.0000 -0.0000 -0.0000 -0.0002 -0.0010 -0.0060 -0.0418 -0.3343 -3.0104

abs\_err =

-0.0779 -0.0405 -0.0273 -0.0206 -0.0165 -0.0138 -0.0118 -0.0104 -0.0092 -0.0083

V Comments

The relative error increases as n increases but the absolute error decreases as n increases due to the way that scaling works.