Assignment: Population Growth PID:\_\_\_\_\_99S380224\_\_\_\_

Population growth for living organism can be simplified into a formula that is similar to that with which we determine the compound interest in a savings account. It is based on a growth rate (r), an initial population (*Ni*), a special mathematical constant (*e*), which is called either Euler’s Number (NOT Euler’s constant, which is different) or Napier’s Constant (we’ll use 2.71828) , the time period (t) in which to determine the change in population size, and the final projected population (*Nf*). We can calculate the new population using the formula . As an example, if an initial population of bacteria is 39,000, If the bacteria follow an exponential growth pattern with rate *r* = 0.02, (a) what will be the population after 5 hours, and (b) what is the actual amount of growth as a percentage?

(% growth = ((final – initial)/initial)\*100%

Ni = 39000

r = 0.02

t = 5

*e* = use 2.71828

Checkpoint 1: Plan:

Instantiate known variables

Implement a while loop on t iterating up the population

Calculate the growth as a percentage

Checkpoint 2: Pseudocode:

Ni = 39000

r = 0.02

t = 5

deltat = 0.001

*e* = 2.71828

while t > 0

N = N\*e^(rt)

t -= deltat

end

growth\_percentage = N-Ni / Ni \* 100%