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ETEC3401 Algorithms

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Assignment 1

1. It's ironic because in 2040 you would be exactly 68 and would have died on your birthday.

Which means you are 48 (Happy late birthday!).

Age of death = 1/29 (year of birth)

x=1/29(1961-x)

29x=1961-x

30x=1961

x=1961/30

2.) The algorithm is a swamp number algorithm using two variables instead of three. This is useful/ niche as it can be used to save memory space.

3.) The algorithm performs a square root function on whatever the b variable is assigned to. It becomes more precise with each iteration of the function until a = q.

4.) 99 games are played because in the first round 72 teams play 1 versus 1 and then 64 teams play starting on round 2 until only 1 team remains.

5.) The algorithm performs a factorial operation. Where f is the summation of the factorial and n is the factorial number.

6.) The algorithm performs a division with a remainder stored.

Where a is the number getting divided.

d is the number we are dividing by.

q is the total of times d will fit into a.

r is the remainder of a-(q\*d).

7.) The algorithm performs an oscillation between 0-0.5 and another oscillation between 0-1. When we multiple the n by 2.0 in the algorithm we see a pattern where the n doesn’t go past for both it originally being set to 0.25 and 0.26. Also, when we multiply the n by 3.9 in the algorithm instead we get an oscillation until 0 and 1.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **0** | **0.25 (2.0)** | **0.25 (3.9)** | **0.26 (2.0)** | **0.26 (3.9)** |
| 1 | 0.25 | 0.73125 | 0.38480000000000003 | 0.75036 |
| 2 | 0.375 | 0.76644140625 | 0.47345792000000003 | 0.73054749456 |
| 3 | 0.46875 | 0.6981350104385375 | 0.49859103597854726 | 0.7677066257332165 |
| 4 | 0.498046875 | 0.8218958187902304 | 0.4999960296407725 | 0.6954993339002887 |
| 5 | 0.49999237060546875 | 0.5708940191969317 | 0.4999999999684725 | 0.8259420407337192 |
| 6 | 0.4999999998835847 | 0.9553987483642099 | 0.49999999999999994 | 0.5606709657211202 |
| 7 | 0.5 | 0.166186721954413 | 0.49999999999999994 | 0.9606442322820199 |
| 8 | 0.5 | 0.5404179120617926 | 0.49999999999999994 | 0.14744687593470315 |
| 9 | 0.5 | 0.9686289302998042 | 0.49999999999999994 | 0.49025454937601765 |
| 10 | 0.5 | 0.11850901017563877 | 0.49999999999999994 | 0.9746296021493285 |