Homework 5

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# Homework problem 1

## Requirements

Approximate the value of e using an infinite series

## Design

Use a while loop with a given input for the bounds. Calculate the individual terms and the sum within the while loop. Display the sum (the approximation) and the actual value of e.

## Iterative developments steps

1. Import the java utility Scanner
2. Create new class
3. Write script for an input variable and multiple other variable for the calculations.
4. Write a count-controlled while loop with the calculation of individual terms and the sum of the terms inside.
5. Display the resulting sum and the actual value of e.

**Tests**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description of test | input | expected result | actual result | cause |
| method1 normal input | 100 | 2.718281828459455  e = 2.71828182845904 | 2.718281828459455  e = 2.71828182845904 | I am a boss |

# Homework problem 2

## Requirements

Create a program that displays increasing terms from 1 to 10 on individual lines.

## Design

Use nested loops to create the desired output.

## Iterative developments steps

1. Create new class
2. Initiate count-controlled while loop.
3. Create count-controlled if statements for each of the possible digits.
4. Write print line statements to display the digits on their respective lines.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description of test | input | expected result | actual result | cause |
| method1 normal input | N/A | 1  1 2  1 2 3  1 2 3 4  1 2 3 4 5  1 2 3 4 5 6  1 2 3 4 5 6 7  1 2 3 4 5 6 7 8  …etc. | 1  1 2  1 2 3  1 2 3 4  1 2 3 4 5  1 2 3 4 5 6  1 2 3 4 5 6 7  1 2 3 4 5 6 7 8  …etc. | Good code |

# Homework problem 3

## Requirements

Approximate the value of pi using an infinite series.

## Design

Use a while loop with a given input for the bounds. Calculate the individual terms and the sum within the while loop. Display the sum (the approximation) and the actual value of pi.

## Iterative developments steps

1. Import the java utility Scanner
2. Create new class
3. Write script for an input variable and multiple other variable for the calculations.
4. Write a count-controlled while loop with the calculation of individual terms and the sum of the terms inside.
5. Display the resulting sum and the actual value of pi.

**Tests**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description of test | input | expected result | actual result | Cause |
| Method1 normal input | 10000 | Estimated value = 3.1414926535900345  Actual value = 3.141592653589793 | Estimated value = 3.1414926535900345  Actual value = 3.141592653589793 | Correct code |

# References

# Introduction to Programming Using Java by Anthony J. Dos Reis