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\* Justin Mendes

\* February 6, 2017

\* Grade 12 Unit 4 Activity 1 Program/Question 1

\* Will show the nth term of the fibonacci sequence

\*/

**import** javax.swing.JOptionPane;

**public** **class** Fibonacci

{

**public** **static** **void** main(String[] args)

{

//Variable Declarations and Initializations

String message;

**int** fibSequence;

fibSequence = Integer.*parseInt*(JOptionPane.*showInputDialog*(**null**, "The first nine fibonacci numbers are listed as follows:\n1, 1, 2, 3, 5, 8, 13, 21, 34, ...\n\nWhat fibonacci term would you like to see?", "Input Term", JOptionPane.***QUESTION\_MESSAGE***));

//Else if because of the else statement always changing "st" and "nd" to "th" AT THE END

//Addition if condition is because of TEEN numbers ending in "th" in sequence

**if**(fibSequence % 10 == 1 && fibSequence <= 10 || fibSequence >= 20)

{

message = "The " + fibSequence + "st fibonacci number is " + *fibonacciTerm*(fibSequence);

}//end if

**else** **if**(fibSequence % 10 == 2 && fibSequence <= 10 || fibSequence >= 20)

{

message = "The " + fibSequence + "nd fibonacci number is " + *fibonacciTerm*(fibSequence);

}//end if

**else** **if**(fibSequence % 10 == 3 && fibSequence <= 10 || fibSequence >= 20)

{

message = "The " + fibSequence + "rd fibonacci number is " + *fibonacciTerm*(fibSequence);

}//end if

**else**

{

message = "The " + fibSequence + "th fibonacci number is " + *fibonacciTerm*(fibSequence);

}//end else

JOptionPane.*showMessageDialog*(**null**, message);

}//end main

**public** **static** **int** fibonacciTerm(**int** term)

{

**if**(term <= 2)

{

**return** 1;

}//end if

**else**

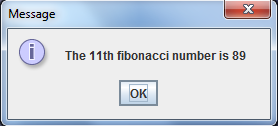
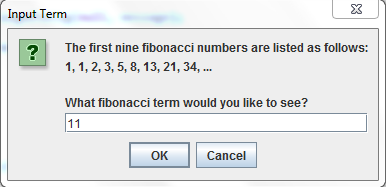
{

**return** *fibonacciTerm*(term - 1) + *fibonacciTerm*(term - 2);

}//end else

}//end method fibonacciTerm

}//end class



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\* Justin Mendes

\* February 8, 2016

\* Grade 12 Unit 4 Activity 1 Program/Question 2

\* Program will use recursion to calculate the number of ways to choose r different objects from a set of n objects

\*/

**import** javax.swing.JOptionPane;

**public** **class** NChooseR

{

**public** **static** **void** main(String[] args)

{

//Variable Declarations and Initializations

**int** setOf, objects, options;

setOf = Integer.*parseInt*(JOptionPane.*showInputDialog*(**null**, "This program will calculate the number of ways\nto choose from r different objects from a n set of objects.\n\nHow many objects would you like to choose?:", "Input Set", JOptionPane.***QUESTION\_MESSAGE***));

objects = Integer.*parseInt*(JOptionPane.*showInputDialog*(**null**, "How many objects are there to choose from?:", "Input Objects", JOptionPane.***QUESTION\_MESSAGE***));

options = *calcFactorial*(objects) / (*calcFactorial*(setOf) \* *calcFactorial*(objects - setOf));

JOptionPane.*showMessageDialog*(**null**, "There are " + options + " ways to choose " + objects + " objects from a set of " + setOf + " options.");

}//end main

**public** **static** **int** calcFactorial(**int** num)

{

**if**(num <= 0)

{

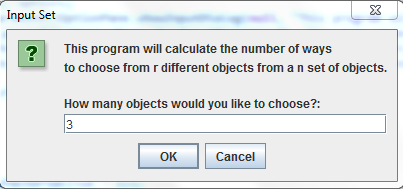
**return** 1;

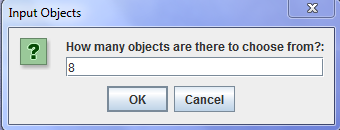
}//end if

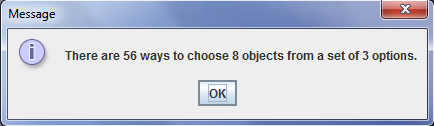
**return** (num \* *calcFactorial*(num - 1));

}//end method calcOptions

}//end class







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\* Justin Mendes

\* February 10, 2017

\* Grade 12 Unit 4 Activity 1 Program/Question 3

\* This program will reduce a fraction using a gcd found by recursion

\*/

**import** javax.swing.JOptionPane;

**public** **class** ReduceFraction

{

**public** **static** **void** main(String[] args)

{

//Variable Declarations and Initializations

**int** numerator, denominator, gcd;

numerator = Integer.*parseInt*(JOptionPane.*showInputDialog*(**null**, "Please enter the numerator for your fraction:", "Input Numerator", JOptionPane.***QUESTION\_MESSAGE***));

denominator = Integer.*parseInt*(JOptionPane.*showInputDialog*(**null**, "Please enter the denominator for your fraction:", "Input Denominator", JOptionPane.***QUESTION\_MESSAGE***));

gcd = *checkGCD*(numerator, denominator);

JOptionPane.*showMessageDialog*(**null**, "The fraction " + numerator + "/" + denominator + " has a GCD of " + gcd + " and can be reduced to: " + numerator / gcd + "/" + denominator / gcd);

}//end main

**public** **static** **int** checkGCD(**int** numerator, **int** denominator)

{

**if**(denominator == 0)

{

**return** numerator;

}//end if

**return** *checkGCD*(denominator, (numerator % denominator));

}//end method findGCD

}//end class

