

Trent University COIS 2020

Test Case for Assignment 1

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Version 1.0

Teammates

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1. Purpose

The purpose of the document is to provide the test plan after completing tasks 1-6 of assignment 1. The objective of the document is to ensure those test cases can intensively test the program working properly.

Tasks

| Test Case number | Task reference | Test to be performed | Expected Result | Actual result | Pass/Fail |
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| 1 | Task 1 | Implement public read and write properties for each data member (type -1 for exponent ending) Input $10x^5+5x^3+2x^2+1$ | Can read and write on the console $10x^5+5x^3+2x^2+1$ | <pre> Insert choice in numbers ==> 1 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 10 Exponent: 5 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 5 Exponent: 3 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 2 Exponent: 2 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 1 Exponent: 1 Exponent: 0 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 0 Exponent: -1 Polynomial inserted into stack S: 10x^5+ 5x^3+ 2x^2+ 1 Size of stack S: 1 10x^5+ 5x^3+ 2x^2+ 1 Insert choice in numbers ==> </pre> | Pass/ Fail |
| 2.1 | Task 1 | Test if exponent is Out Of Range (if exponent is greater than 20) for example, $9x^{21}+2$ | Argument Out Of Range Exception | <pre> Insert choice in numbers ==> 1 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 9 Exponent: 21 System.Exception: System.ArgumentOutOfRangeException: Specified argument was out of the range of valid values. (Parameter 'You need to use values between 0 and 20') at Term.Insert(Int32 value) in C:\Users\David Chan\source\repos\COIS2020M_Assignment1_DavidChan\COIS2020M_Assignment1_DavidChan\Program.cs:line 23 at Term.Insert(Coefficient coeff, Int32 exponent) in C:\Users\David Chan\source\repos\COIS2020M_Assignment1_DavidChan\COIS2020M_Assignment1_DavidChan\Program.cs:line 30 at Program.InsertPolynomial(Polynomial p) in C:\Users\David Chan\source\repos\COIS2020M_Assignment1_DavidChan\COIS2020M_Assignment1_DavidChan\Program.cs:line 119 at Program.Main() in C:\Users\David Chan\source\repos\COIS2020M_Assignment1_DavidChan\COIS2020M_Assignment1_DavidChan\Program.cs:line 13 </pre> | Pass/ Fail |
| 2.2 | Task 1 | Test if exponent is Out Of Range (if exponent is less than 0) for example, $9x^{-2}+2$ | FormatException | <pre> 1) Create and insert into S 2) To add two polynomials from S (retrieved by index) and to insert the resultant polynomial into S, 3) To multiply two polynomials from S (retrieved by index) and to insert the resultant polynomial into S, 4) To delete the polynomial from S at a given index, 5) To evaluate the polynomial from S at a given index, 6) To clone the polynomial from S (retrieved by index) and to insert its clone into S. 8) Exit Insert choice in numbers ==> 1 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 1 Exponent (0-20): -2 One of the identified items was in an invalid format. Only accept integer value >= -1 and <= 20! Try again 9) Exponent (0-20): </pre> | Pass/ Fail |
| 3 | Task 1 | Test if random character is input for example, Hello World for coefficient | FormatException | <pre> Insert choice in numbers ==> 1 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: Hello World Input string was not in a correct format. Only accept double value! Try again Coefficient: </pre> | Pass/ Fail |
| 4 | Task 1 | Test if random character is input for example, Hello World for exponent | FormatException | <pre> Insert choice in numbers ==> 1 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 5 Exponent: Hello World Input string was not in a correct format. Only accept integer value >= -1! Try again! Exponent: </pre> | Pass/ Fail |

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| 5 | Task 1 | Test if exponent is decimal For example: $0.003x^5 + 0.3x^3 + 2x^{1.5} + 1$ | FormatException | <pre> Insert choice in numbers ==> 1 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 0.003 Exponent: 5 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 0.3 Exponent: 3 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 2 Exponent: 1.5 Input string was not in a correct format. Only accept integer value >= -1! Try again! Exponent: 1.5 Input string was not in a correct format. Only accept integer value >= -1! Try again! Exponent: </pre> | Pass/ Fail |
| 6 | Task 1 | Test if coefficient is decimal For example: $0.003x^5 + 0.3x^3 + 2x^2 + 1$ | Produces $0.003x^5 + 0.3x^3 + 2x^2 + 1$ from example | <pre> Insert choice in numbers ==> 1 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 0.003 Exponent: 5 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 0.3 Exponent: 3 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 2 Exponent: 2 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 1 Exponent: 1 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 0 Exponent: -1 Polynomial inserted into stack S: 0.003x^5+ 0.3x^3+ 2x^2+ 1x^1 Size of stack S: 1 0.003x^5+ 0.3x^3+ 2x^2+ 1x^1 Insert choice in numbers ==> </pre> | Pass/ Fail |
| 7 | Task 1 | Returns -1, 0, or 1 if the exponent of the current term | Returns -1, 0, or 1 | <pre> Case 1: should return -1 when current term with exponent 5 compare to term with exponent 6 Case 1 PASSED Case 2: should return 0 when current term with exponent 5 compare to term with exponent 5 Case 2 PASSED Case 3: should return 1 when current term with exponent 5 compare to term with exponent 4 Case 3 PASSED </pre> | Pass/ Fail |
| 8 | Task 1 | if obj is either null or not a term | ArgumentException | <pre> Case 4: should raises an ArgumentException if obj is null CASE 4 PASSED: ArgumentException thrown for null Case 5: should raises an ArgumentException if obj is not a term CASE 5 PASSED: ArgumentException thrown for non-term object CompareTo function PASSED </pre> | Pass/ Fail |

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| 9 | Task 2 | <p>Inserts term t into the current polynomial in its proper order.</p> <p>For example: (p)= $3x^2+2$</p> <p>Add a term $2x^2$</p> | <p>If a term with the same exponent already exists then the two terms are added together</p> <p>After the team added to (p), the result will be $5x^2+2$</p> | <pre> Menu: 1) Create and insert into S 2) To add the polynomials from S (retrieved by index) and to insert the resultant polynomial into S. 3) To multiply two polynomials from S (retrieved by index) and to insert the resultant polynomial into S. 4) To delete the polynomial from S at a given index. 5) To evaluate the polynomial from S at a given index. 6) To clone the polynomial from S (retrieved by index) and to insert its clone into S. 0: Exit Insert choice in numbers ==> 1. What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 3 Exponent: 2 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 2 Exponent: 0 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 0 Exponent: -1 Polynomial inserted into stack S: $3x^2+2$ Size of stack S: 1 $3x^2+2$ Insert choice in numbers ==> 1. What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 2 Exponent: 2 What term do you want to insert into the polynomial (type -1 for exponent for ending)? Coefficient: 0 Exponent: -1 Polynomial inserted into stack S: $2x^2$ Size of stack S: 2 $3x^2+2$ $2x^2$ Insert choice in numbers ==> 2 Which polynomials do you want to add from? Input index in range 0 - 1 Index of the first polynomial: 1 Index of the second polynomial: 0 $3x^2+2$ $2x^2$ $5x^2+2$ Insert choice in numbers ==> </pre> | Pass/ Fail |
| 10 | Task 2 | <p>Adds polynomials p and q</p> <p>For example: (p)= $3x^2+2$</p> <p>(q) = $6x^2+2x+1$</p> | <p>Adds polynomials p and q to yield a new polynomial</p> <p>output (p) + (q)= $9x^2+2x+3$</p> | <pre> TESTING STARTED... TESTING POLYNOMIAL... TESTING * operator and test with evaluate... Case 1: Add two polynomials p, q and yield RESULT, check whether RESULT.Evaluate(x) == (p.Evaluate(x) + q.Evaluate(x)) Results: "9910" Case 1 PASSED * operator PASSED </pre> | Pass/ Fail |
| 11 | Task 2 | <p>Adds polynomials from index that doesn't exist</p> | <p>Argument Out Of Range Exception</p> | <pre> Size of stack S: 2 S has the following polynomials: $2x^2+1x^1$ $6x^2+6x^5$ Insert choice in numbers ==> 2 Which polynomials do you want to add from? Input index in range 1 - 2 Index of the first polynomial: 1 Index of the second polynomial: 3 Specified argument was out of the range of valid values. (Parameter 'Size of L is 2, unable to retrieve a t index 1') -- Must send values between 1 and 2, send again! Index of the second polynomial: 0 </pre> | Pass/ Fail |
| 12 | Task 3 | <p>Multiplies polynomials p and q</p> | <p>Multiplies polynomials p and q to yield a new polynomial</p> | <pre> TESTING STARTED... TESTING POLYNOMIAL... TESTING * operator... Case 1: multiply two polynomials p, q and yield RESULT, check whether RESULT.Evaluate(x) == (p.Evaluate(x) * q.Evaluate(x)) Results: "9910" Case 1 PASSED * operator PASSED </pre> | Pass/ Fail |
| 13 | Task 3 | <p>Multiplies polynomials from an index that doesn't exist</p> | <p>Argument Out Of Range Exception</p> | <pre> Size of stack S: 4 S has the following polynomials: $2x^2+1x^1$ $6x^2+6x^5$ $6x^2+6x^5+2x^2+1x^1$ $5x^6+3x^4$ Insert choice in numbers ==> 3 Which polynomials do you want to multiply from? Input index in range 1 - 4 Index of the first polynomial: 3 Index of the second polynomial: 5 Specified argument was out of the range of valid values. (Parameter 'Size of L is 4, unable to retrieve a t index 1') -- Must send values between 1 and 4, send again! Index of the second polynomial: 0 </pre> | Pass/ Fail |

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| 14 | Task 4 | Deletes the polynomial at a given index | Deletes the selected polynomial | <pre> Insert choice in numbers ==> 2 Which polynomials do you want to add from? Input index in range 1 - 1 Index of the first polynomial: 1 Index of the second polynomial: 1 3x^3+ 2x^2+ 1x^1 6x^3+ 4x^2+ 2x^1 Insert choice in numbers ==> 4 Which index do you want to delete at? Input index in range 1 - 2 1 Polynomial to be deleted from stack S: 3x^3+ 2x^2+ 1x^1 Size of stack S: 1 S has the following polynomials now: 6x^3+ 4x^2+ 2x^1 Insert choice in numbers ==> █ </pre> | Pass/ Fail |
| 15 | Task 4 | Delete a polynomial when the stack is empty | Error message: "Stack is empty" | <pre> Size of stack S: 1 S has the following polynomials now: 6x^3+ 4x^2+ 2x^1 Insert choice in numbers ==> 4 Which index do you want to delete at? Input index in range 1 - 1 1 Polynomial to be deleted from stack S: 6x^3+ 4x^2+ 2x^1 Size of stack S: 0 S has the following polynomials now: Insert choice in numbers ==> 4 S is empty, please insert some polynomials through command 1 Insert choice in numbers ==> █ </pre> | Pass/ Fail |
| 16 | Task 4 | Delete a polynomial from invalid index | Argument Out Of Range Exception | <pre> Size of stack S: 1 S has the following polynomials: 2x^2+ 1x^1 Insert choice in numbers ==> 4 Which index do you want to delete at? Input index in range 1 - 1 2 Specified argument was out of the range of valid values. (Parameter 'Size of L is 1, unable to retrieve a Index 1') -- Must send values between 1 and 1, send again! █ </pre> | Pass/ Fail |
| 17 | Task 5 | Evaluates the current polynomial at x | Evaluates the current polynomial at x and returns the result | <pre> TESTING STARTED... TESTING POLYNOMIAL... TESTING Polynomial Evaluate function... Case 1: test evaluate with polynomial 3x^2 + 2x^2 with x = 5, answer should be equal to 2*5 + 3*(5^2) Case 1 PASSED Polynomial Evaluate function PASSED </pre> | Pass/ Fail |
| 18 | Task 5 | Evaluates a polynomial with invalid 'x' value | FormatException | <pre> Insert choice in numbers ==> 5 What index do you want to evaluate at? Input index in range 1 - 5 1 abc The input string 'abc' was not in a correct format. Must send an integer, send again! 2 For polynomial 2x^2+ 1x^1 When x = 2, polynomial = 10 </pre> <p>Extra:</p> <pre> TESTING STARTED... TESTING Term evaluate function... Case 18: using 2x^2 and 1x, using x = 2 What value do you want to evaluate at: 2 Passed, it is 10 </pre> | Pass/ Fail |

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| 19 | Task 6 | Creates and returns a clone of the current polynomial except that the exponents Input $4x^3 - 3x + 9$ | current polynomial are assigned to the coefficients of the clone in reverse order Output: $9x^3 - 3x + 4$ | <pre>TESTING STARTED... TESTING POLYNOMIAL... TESTING Polynomial Clone function... Case 1: clone of polynomial 4x^3-3x+9 should be the same as 9x^3 - 3x + 4 Case 1 PASSED Polynomial CLONE function PASSED</pre> | Pass/ Fail |
| 20 | Task 3,4,5 | Prints the current polynomial result of test case 20 | $9x^3 - 3x + 4$ | <pre>TESTING STARTED... TESTING POLYNOMIAL... TESTING Polynomial Clone function... Case 1: clone of polynomial 4x^3-3x+9 should be the same as 9x^3 - 3x + 4 Case 1 PASSED Polynomial CLONE function PASSED</pre> | Pass/ Fail |