# CMSC 350 - Project 2

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Description A program that reads space separated values (double for coefficient and int for exponent) from a text file and creates Polynomial object from them. The Polynomial objects are represented by a singly linked list of term objects. The term objects hold the coefficient and exponent values. As the file is being read, the objects are displayed and then determined if sorted weak or strong.

UML chart
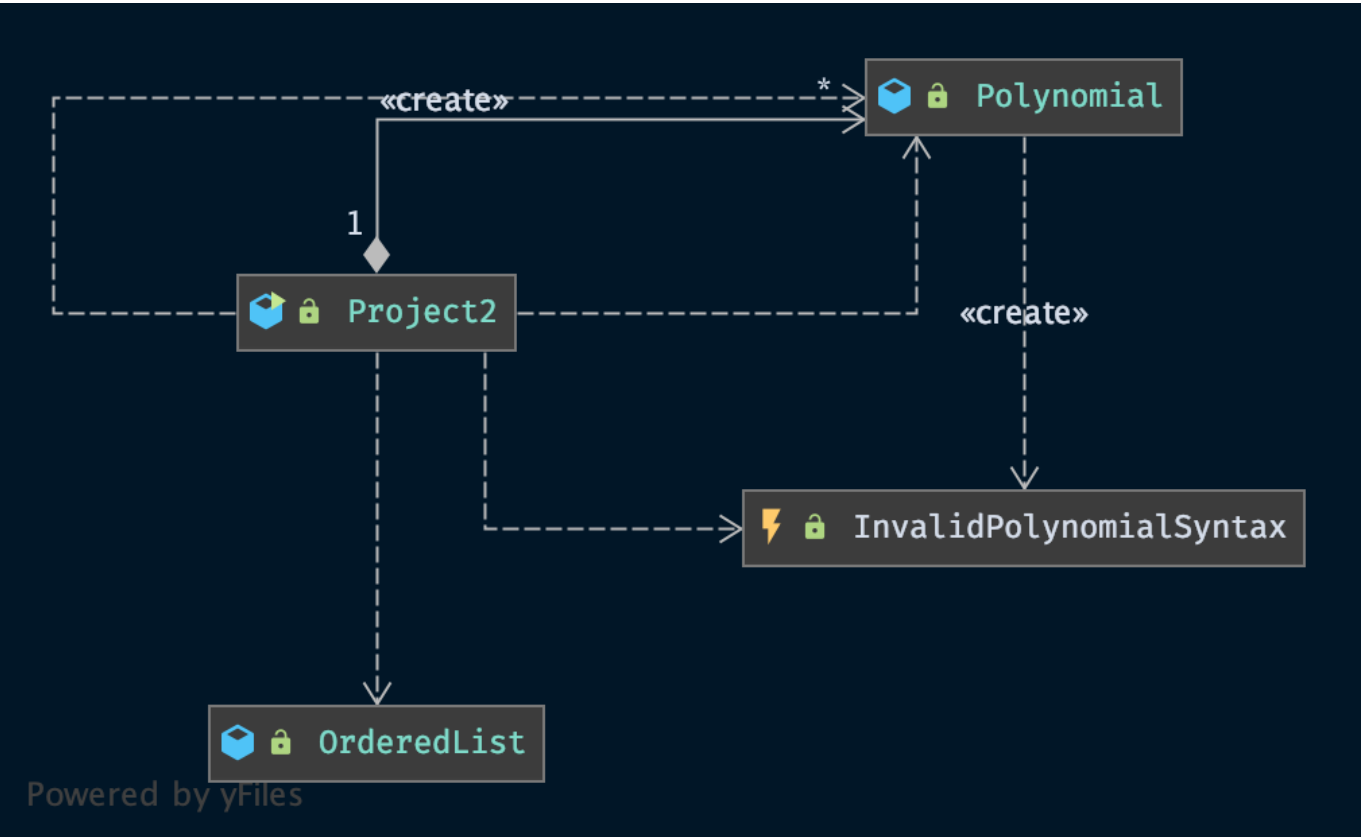
Test cases

Test Case	Input	Expected Output	Actual Output	Pass?	Notes

Test Case	Input	Expected Output	Actual Output	Pass?	Notes
1	1.0 1 2.0 2 1.0 1, 3.0 3 2.0 2 1.0 1, 4.0 4 3.0 3 2.0 2 1.0 1, 5.0 5 4.0 4 3.0 3 2.0 2 1.0 1	Strong Ordered: true Weak Ordered: true	Please see screenshot below	Yes	Testing a file in both strong and weak sorted order.

```
1.0x
2.0x^2 + 1.0x
3.0x^3 + 2.0x^2 + 1.0x
4.0x^4 + 3.0x^3 + 2.0x^2 + 1.0x
5.0x^5 + 4.0x^4 + 3.0x^3 + 2.0x^2 + 1.0x
Strong Ordered: true
Weak Ordered: true
```

Test Case	Input	Expected Output	Actual Output	Pass?	Notes
2	4.0 3 2.5 1 8.0 0, 5.0 4 5.0 0, 4.5 4 5.7 2 8.6 0	Strong Ordered: false Weak Ordered: true	Please see screenshot below	Yes	Testing a file that is in weak order but not strong order. Also includes zero exponents.

```
4.0x^3 + 2.5x + 8.0
5.0x^4 + 5.0
4.5x^4 + 5.7x^2 + 8.6
Strong Ordered: false
Weak Ordered: true
```

| Test Case	Input	Expected Output	Actual Output	Pass?	Notes
3	5.0 5 4.0 4 3.0 3 2.0 2 1.0 1, 4.0 4 3.0 3 2.0 2 1.0 1, 3.0 3 2.0 2 1.0 1, 2.0 2 1.0 1, 1.0 1	Strong Ordered: false Weak Ordered: false	Please see screenshot below	Yes	Testing a file that is not strong nor weak ordered.

```
5.0x^5 + 4.0x^4 + 3.0x^3 + 2.0x^2 + 1.0x
4.0x^4 + 3.0x^3 + 2.0x^2 + 1.0x
3.0x^3 + 2.0x^2 + 1.0x
2.0x^2 + 1.0x
1.0x
Strong Ordered: false
Weak Ordered: false
```

Test Case	Input	Expected Output	Actual Output	Pass?	Notes
4	3.0 3 2.0 2 1.0	error	JOptionPane warning against invalid syntax	Yes	Testing a file with a missing exponent. Exception is caught in main class.
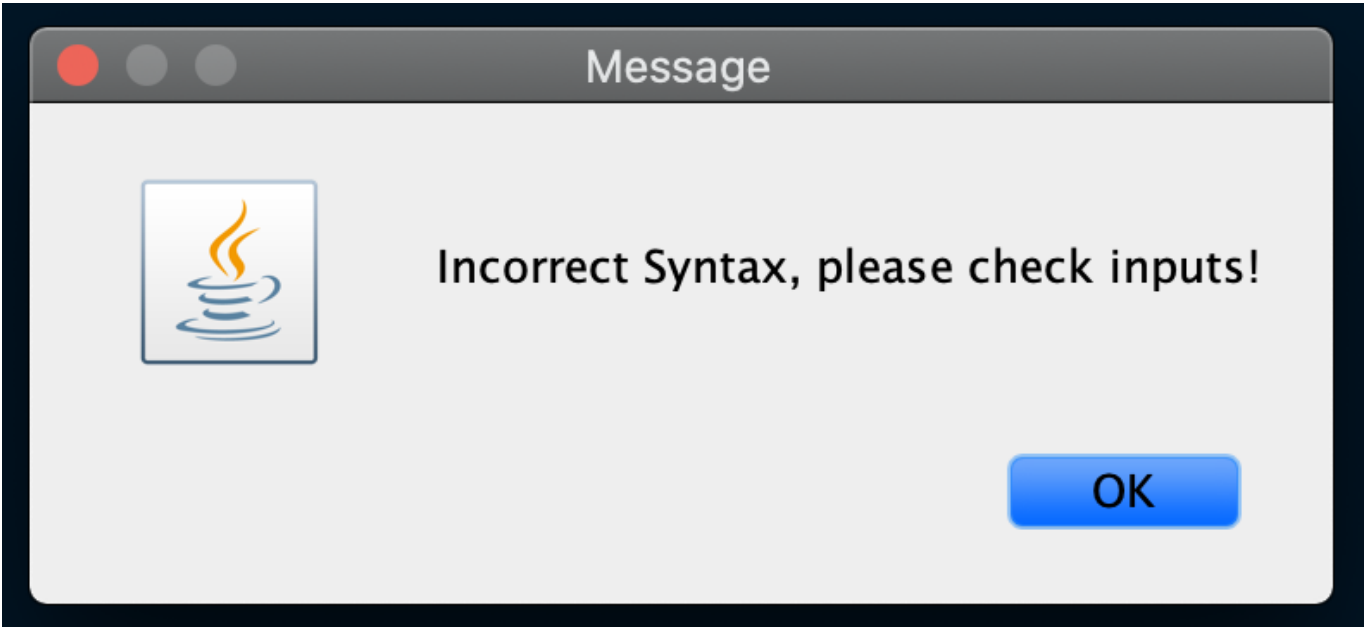
Test Case	Input	Expected Output	Actual Output	Pass?	Notes
5	2.5 -5 2.0 -4 1.5 -3 1.0 -2 0.5 -1	error	JOptionPane warning against invalid syntax	Yes	Testing a file with a missing exponent. Exception is caught in main class.
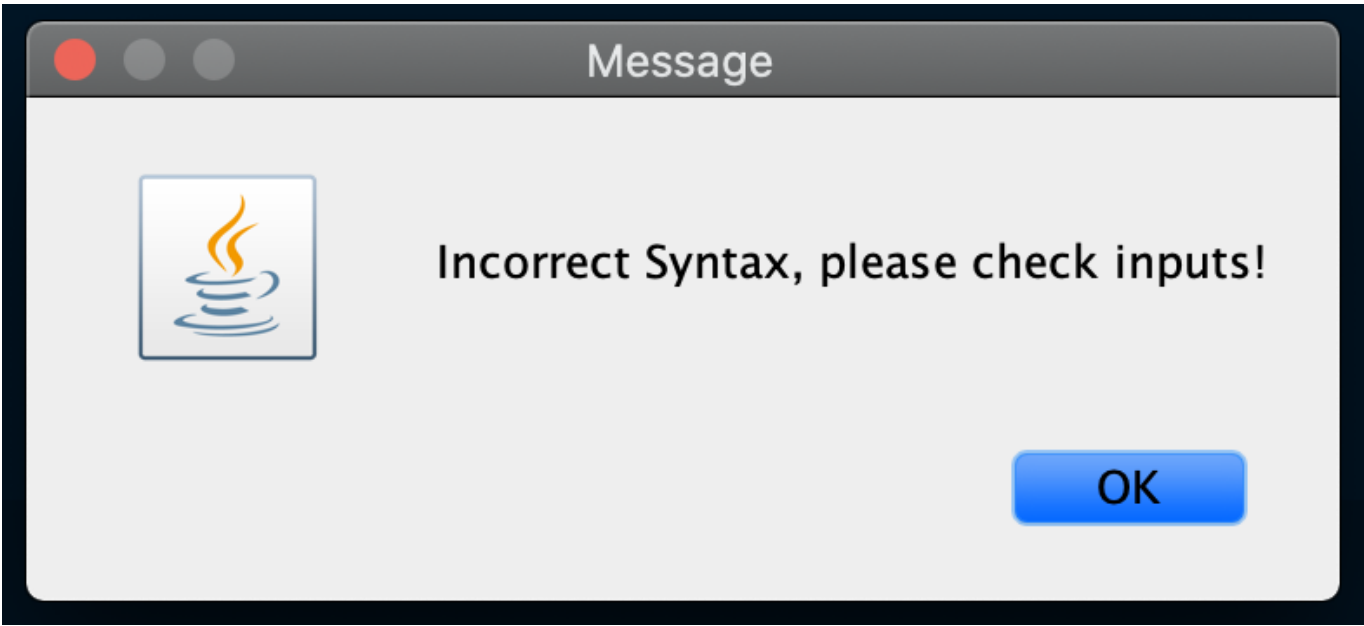
Lessons learned

I learned much about the inter-workings of linked list while working on this program. Before, I would simply use the pre-defined linked list class without much thought to how it was implemented. However now, I have a newfound appreciation for it. In the future, I will likely just implement my own linked list if it is needed. I also learned a lot about the comparable interface. I found the overloaded implementation of the checkSorted method very interesting. Specifically how the one parameter method should call the second.