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Lab Report

# Introduction

For many modern games there will be movement on the screen in some form. To describe motion over time we need to be able to access velocity, acceleration, and the change in time. In this lab we did a linear approach to a ball being thrown up in the air. This motion can be applied to many different situations for characters, projectiles, and obstacles.

# Methods

Forward Euler is a method we can use to simulate this movement.

We can compare this to an analytical approach using more math with precise results like the following:

# Results

Results

# Conclusion

Conclusion

# Post-Lab

1. Were there any noticeable differences in the run-times when using a different time-steps? If so, why would this ever be an issue?
2. When comparing the results of the Forward Euler calculations to the analytic calculations, which time-step did best? Which did the worst?
3. Is there any reason why you would ever select a time-step that you give you anything less than the best fit to the analytic solution?
4. Wind resistance is a force that causes an object in motion to slow down over time much like friction. Wind resistance, however, produces an acceleration that is proportional to the velocity rather than a constant acceleration. The faster an object is going, the stronger the force of wind resistance is. Explain the benefits of using Forward Euler to model motion under the influence of wind resistance as opposed to solving for an analytic solution.
5. Where else, other than a ball moving through the air, might you employ a wind resistance-like behavior?