INF-1400: Object-oriented programming

Assignment 3

Joakim Hjertholm

April 16th, 2020

1 Introduction

This assignment is based on making a version of the game Mayhem. The game should at minimum have 2 players that can fly around and fire projectiles. There should also be a score system that keeps track of the players actions, one loses points by crashing or getting hit by a projectile and you gain points by hitting other players with a projectile. The players will also have fuel that determent how long they can keep moving around, to refill they need to interact with an object that is determent by the developer.

2 Technical Background

Inheritance:

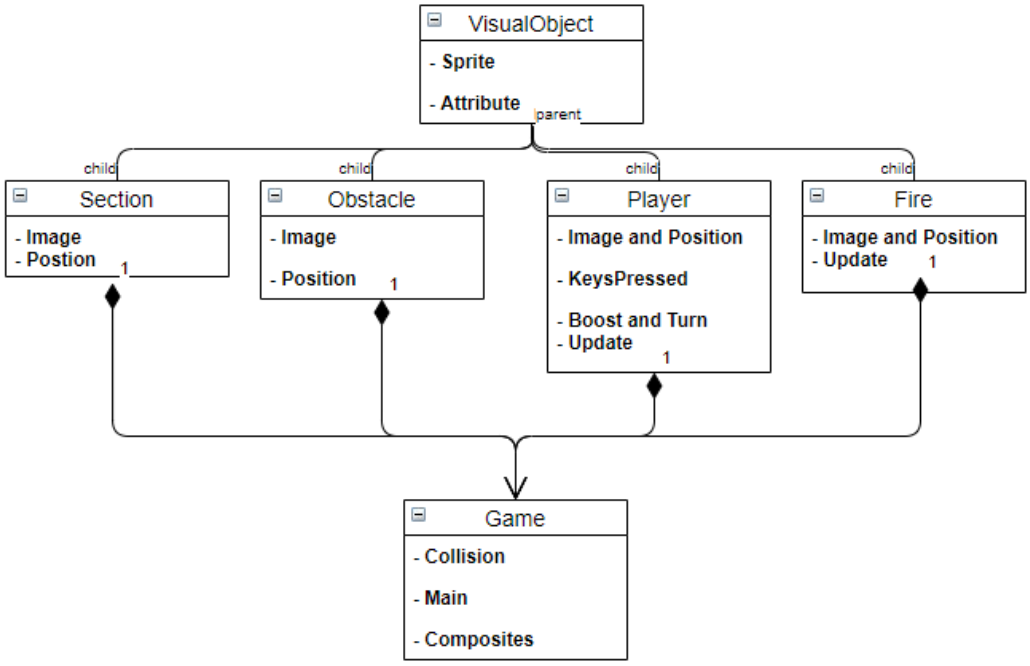
- This is when a class inherits the attributes of another class, making it like a child. The new class will be able to change and use all functions or variables that exist in the parent class.

Vector:

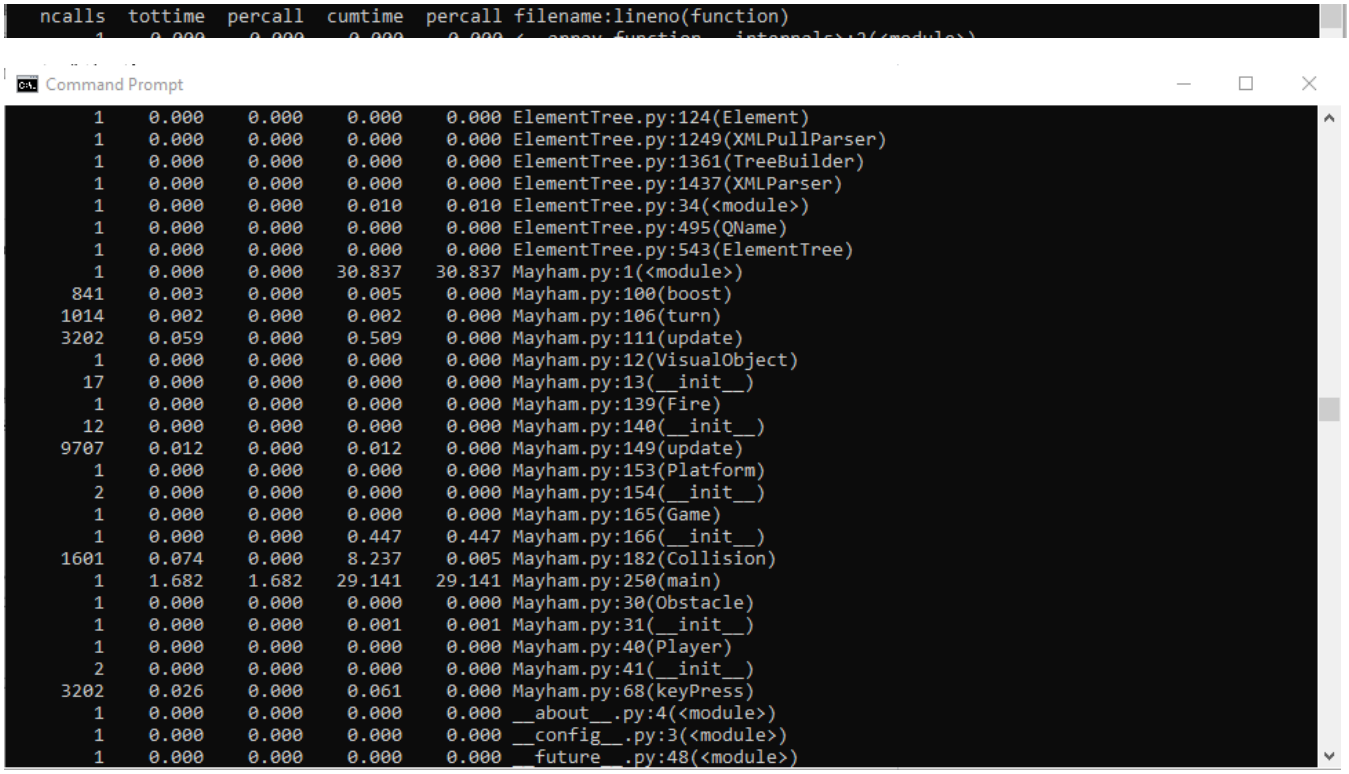
- A quantity having direction as well as magnitude, especially when determining the position of the one point in space relative to another.

3 Design and Implementation

This version of Mayhem has two players and they can turn, thrust and fire small projectiles. They can only thrust in the direction they are facing and can not go backwards without the help of gravity. There is one obstacle in the middle of the screen, this was made to be able to use as cover and as terrain, increasing the difficulty. One loses points by crashing with the objects, ether the projectile or the obstacle in the center. There is no limit to the score letting the players decide when there done. All the classes except for one are sprites and inherit from one parent class. Then they all get used in the last Game class as composites to create the finished product. There was one bug left that did not get fixed, and that's the collision detection between the platforms and the turtles.



4 Experiment and Results



```
   ncalls  tottime  percall  cumtime  percall filename:lineno(function)
```

Command Prompt

```
        1    0.000    0.000    0.000    0.000 ElementTree.py:124(Element)
        1    0.000    0.000    0.000    0.000 ElementTree.py:1249(XMLPullParser)
        1    0.000    0.000    0.000    0.000 ElementTree.py:1361(TreeBuilder)
        1    0.000    0.000    0.000    0.000 ElementTree.py:1437(XMLParser)
        1    0.000    0.000    0.010    0.010 ElementTree.py:34(<module>)
        1    0.000    0.000    0.000    0.000 ElementTree.py:495(QName)
        1    0.000    0.000    0.000    0.000 ElementTree.py:543(ElementTree)
        1    0.000    0.000   30.837   30.837 Mayham.py:1(<module>)
      841    0.003    0.000    0.005    0.000 Mayham.py:100(boost)
     1014    0.002    0.000    0.002    0.000 Mayham.py:106(turn)
     3202    0.059    0.000    0.509    0.000 Mayham.py:111(update)
        1    0.000    0.000    0.000    0.000 Mayham.py:12(VisualObject)
       17    0.000    0.000    0.000    0.000 Mayham.py:13(__init__)
        1    0.000    0.000    0.000    0.000 Mayham.py:139(Fire)
       12    0.000    0.000    0.000    0.000 Mayham.py:140(__init__)
     9707    0.012    0.000    0.012    0.000 Mayham.py:149(update)
        1    0.000    0.000    0.000    0.000 Mayham.py:153(Platform)
        2    0.000    0.000    0.000    0.000 Mayham.py:154(__init__)
        1    0.000    0.000    0.000    0.000 Mayham.py:165(Game)
        1    0.000    0.000    0.447    0.447 Mayham.py:166(__init__)
     1601    0.074    0.000    8.237    0.005 Mayham.py:182(Collision)
        1    1.682    1.682   29.141   29.141 Mayham.py:250(main)
        1    0.000    0.000    0.000    0.000 Mayham.py:30(Obstacle)
        1    0.000    0.000    0.001    0.001 Mayham.py:31(__init__)
        1    0.000    0.000    0.000    0.000 Mayham.py:40(Player)
        2    0.000    0.000    0.000    0.000 Mayham.py:41(__init__)
     3202    0.026    0.000    0.061    0.000 Mayham.py:68(keyPress)
        1    0.000    0.000    0.000    0.000 __about__.py:4(<module>)
        1    0.000    0.000    0.000    0.000 __config__.py:3(<module>)
        1    0.000    0.000    0.000    0.000 __future__.py:48(<module>)
```

The Game was running for about 30 sec and as you can see it took 1.682 sec for main to launch the game. Some interesting mentions are update and Collision, it took 0.059 sec to call update every time and had 9707 calls. With Collision there was 1601 calls and it took 0.074 sec to execute. These are big functions with a lot of calls to other functions.

5 Discussion

The game has a bug that needs to be fixed before the game can run properly and this is the fuel platform. Different approaches where made but all where unsuccessful, tried to not use a "png" file and make a rect, but no luck. A print statement was placed in the if collide statement, but it did not print, so the problem lies in the if statement or somewhere else.

Other than the one bug the game runs almost perfect, and the sprite masked was implemented making the sprites collide with each other's mask and not the total size of the image

6 Conclusion

Made a version of the game called Meyhem and implemented two players with different controls. The players have obstacles and each other to look out for when they fight for points to get the highest score.