**Spike:** 9

**Title:** Agent Marksmanship

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**Goals / deliverables:**

Create an agent target simulation which can:

* Attacking agent (Stationary is good) which has:
  + Fast / Slow moving accurate projectiles
  + Fast / Slow moving inaccurate projectiles
* Target Agent must:
  + Be moving (traveling between two points is a good start)
  + When hit have visual effect to show

**Technologies, Tools, and Resources used:**

* Knowledge of python
  + <https://docs.python.org/3/tutorial/>
* Python Interpreter
  + Visual Studio
    - <https://www.visualstudio.com/downloads/>
* Knowledge of how an agent should work out how to find the best hiding spot
  + <https://ilearn.swin.edu.au/bbcswebdav/pid-6302928-dt-content-rid-34403398_2/courses/2017-HS1-COS30002-220387/Autonomously%20Moving%20Agents.ppt.pdf>

**Tasks undertaken:**

* Add an attacking agent
  + X axis has a locked position
  + Y is a random value between the height of the window.
    - This is to variance between how the agent can different predict the targets location from different locations
* The target agent:
  + Can be still
  + Travel between two point
* Added a bullet
  + Took code from pursuit
  + Check accuracy for stationary target
  + Added bullet types
  + Randomly generates numbers between 0-10 and if the value was lower than the value of the bullet type it was an accurate shot
  + Randomly generates numbers between 0-10 and if the value was higher than the value of the bullet type it was an inaccurate shot
    - If the value was higher then added an extra 100 to each the x and y axis
* When the target is moving:
  + Edited the pursuit code. Instead of a LookAhead variable I used the targets pos + vel and then minus the bullets vel
  + Checked accuracy
  + Added bullet types
  + Randomly generates numbers between 0-10 and if the value was lower than the value of the bullet type it was an accurate shot
  + Randomly generates numbers between 0-10 and if the value was higher than the value of the bullet type it was an inaccurate shot
    - If the value was higher then added an extra 50 to each the x and y axis
* When the target is hit:
  + Targets colour changes to red
  + Target slows down
  + Unable to fire for 100 ticks

**What we found out:**

* The agent has good accuracy when the target is traveling in a straight line
* The different bullets types are working as expected
* A visual affect when the target is hit. You see it changes colour and slows down

**Open issues/ Risks:**

* When the target changes direction the agent has, trouble predicting the change
* Some bullets that clip the agent don’t disappear straight away. Change the radius to a slightly bigger one on the target so when you look at the screen it is removed before it passes through your target

**Notes:**

World Keys:

Q – Hanzo Main (Slow, Inaccurate)

W – Tracer Main (Fast, Inaccurate)

E – Ana Main (Fast, Accurate)

R – Symmetra Main (Slow, Accurate)

T – Make the target move

Y – Freeze Agent

S – Shot

D – Move Shooting Agent

G – Auto Fire (For the lazy person or for using Symmetra as seen in Overwatch)

H – Remove Bullets

### Appendix

#### Figure 1.1 Agent hitting the target

