## 1. Introduction

I've made a couple of improvements to the project to provide a unified way to compile the project on Windows and Linux. I've included precompiled binaries for Windows and Linux.

## 2. Compilation on Windows

- Install Visual Studio from `https://visualstudio.microsoft.com/downloads/`
- Install VCPKG from `https://vcpkg.io/en/getting-started.html`
- Add VCPKG folder to PATH:
- Option 1: Command Line tools

```
1    REM Assuming that VCPKG cloned and bootstrapped in c:\src\vcpkg
2    REM setx for the global environment, set for the local
3    setx PATH c:\src\vcpkg;%PATH%
4    set  PATH c:\src\vcpkg;%PATH%
```

- Option 2: PowerShell

```
1    # Assuming that VCPKG cloned and bootstrapped in c:\src\vcpkg
2    [Environment]::SetEnvironmentVariable("PATH", "c:\src\vcpkg;${PATH}", "Machine")
3        Set-Item -Path Env:PATH -Value "c:\src\vcpkg;${PATH}"
```

- Option 3: Manually in **System Properties −> Environment Variables**
- Navigate to the folder with the project
- Run *build.bat*
- Open *build EDGSG.sln* in Visual Studio to work with the source code

## 3. Compilation on Linux

- Install VCPKG from `https://vcpkg.io/en/getting-started.html`
- Add VCPKG folder to System PATH
- Option 1: Temporary local environment

```
1        # Assuming that VCPKG cloned and bootstrapped in ~/vcpkg
2        export PATH="~/vcpkg;${PATH}"
```

- Option 2: Local environment and Bash profile

```
1        # Assuming that VCPKG cloned and bootstrapped in c:\src\vcpkg
2        export PATH="~/vcpkg;${PATH}"
3        echo 'export PATH="~/vcpkg;${PATH}"' >> ~/.bashrc
```

- Navigate to the folder with the project
- Run build.sh

**Important Note:** the VCPKG requests installation of additional packages

## 4. Intersections

Two segments (S1 and S2), two rays (R1 and R2), two lines (L1 and L2) and a polygon (P1) so that there are the following intersections (no more): L1-L2, S1-S2, S1-R1, L1-P, R2-P. Paint the point intersection in all cases.

Additionally, I've switched from the single Vec2d to std::vector<Vec2d> in Polygon's intersection methods to allow multiple intersections.
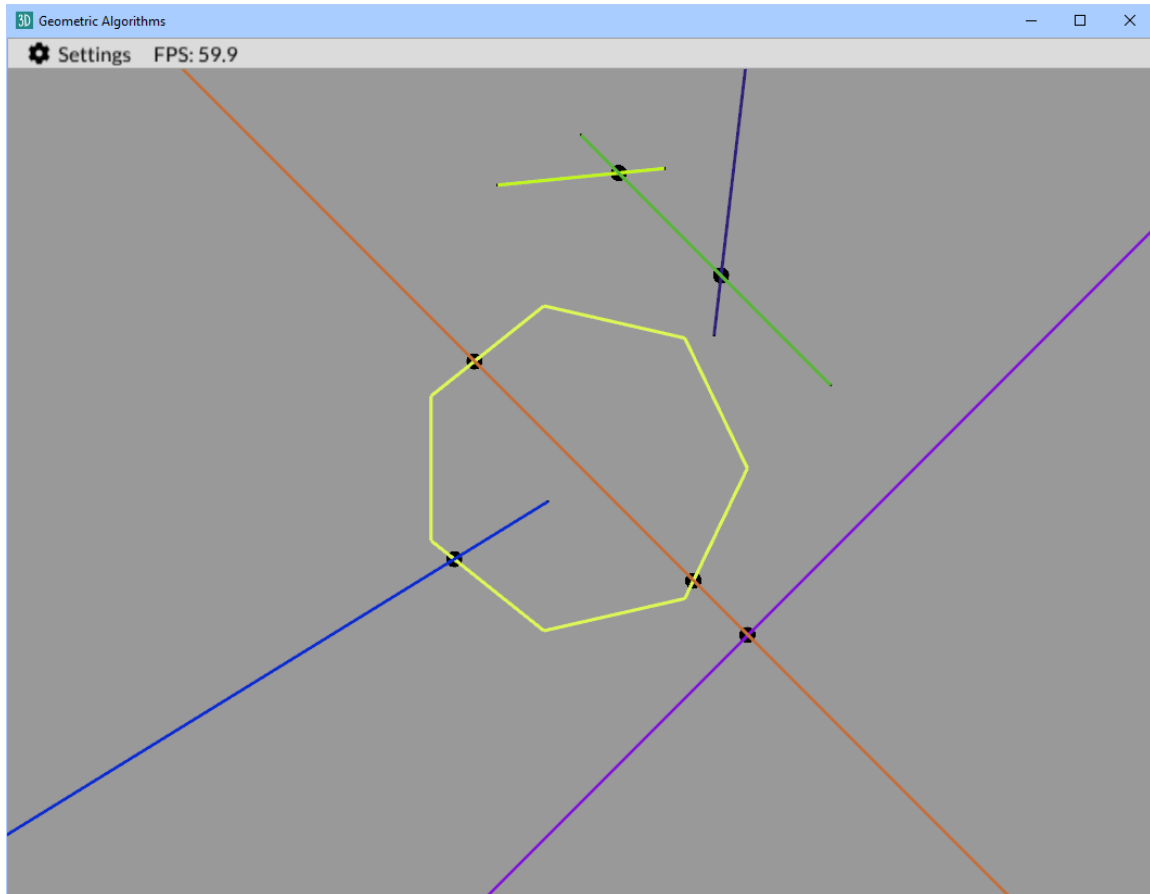


Figure 1: Result of the intersections.
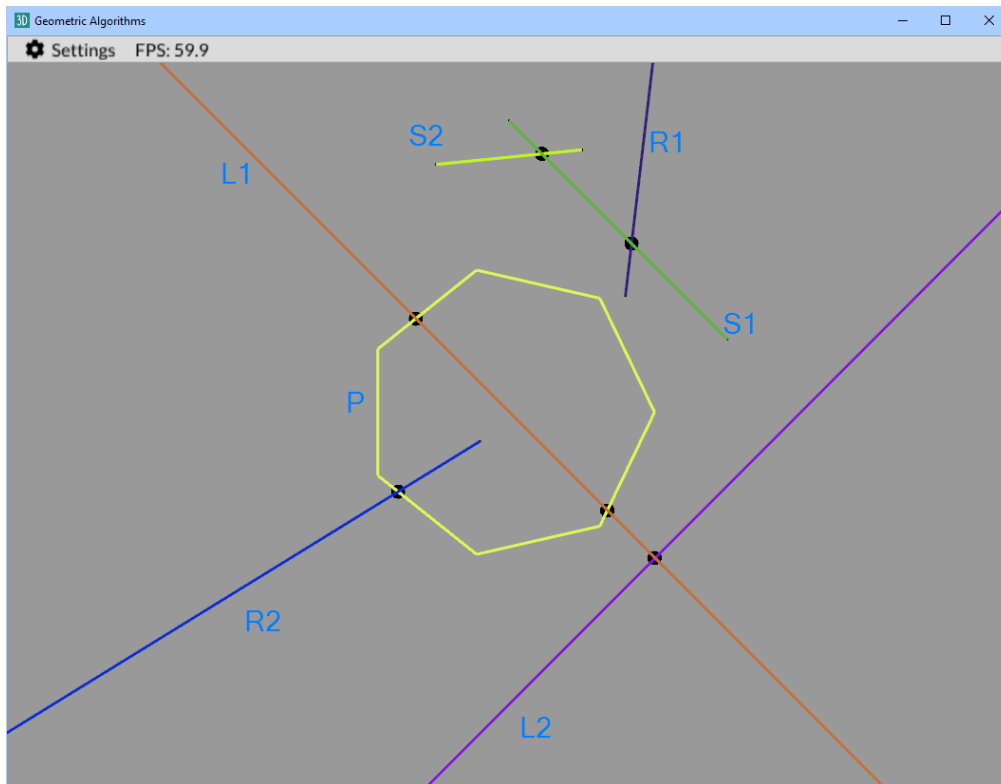
## 5. Intersections with legend



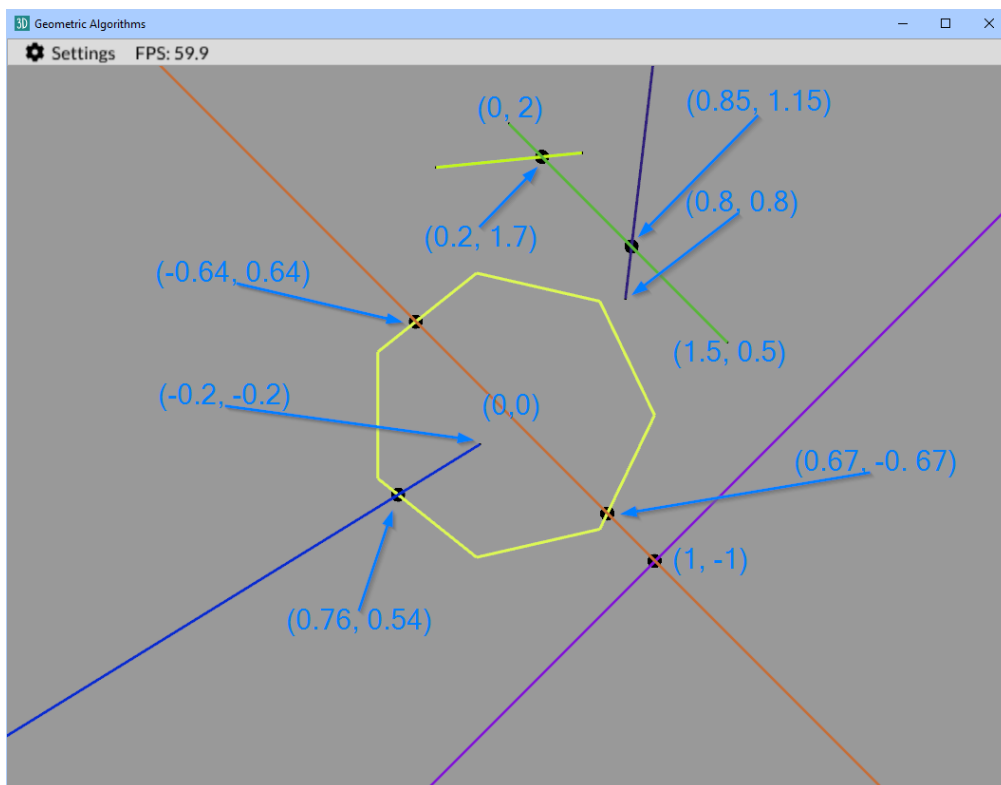Figure 2: Result of the intersections with legend.



Figure 3: Result of the intersections with postitions.

## 6. Distances

```
 1    Distances from the polygon points:
 2    ==================================================
 3    Distance from S1 to Polygon v#0 is 0.707107
 4    Distance from S1 to Polygon v#1 is 0.302983
 5    Distance from S1 to Polygon v#2 is 0.705646
 6    Distance from S1 to Polygon v#3 is 1.57216
 7    Distance from S1 to Polygon v#4 is 2.10977
 8    Distance from S1 to Polygon v#5 is 2.1821
 9    Distance from S1 to Polygon v#6 is 1.55286
10    Distance from S1 to Polygon v#7 is 0.707107
11    Distance from S2 to Polygon v#0 is 1.86815
12    Distance from S2 to Polygon v#1 is 1.02563
13    Distance from S2 to Polygon v#2 is 0.781924
14    Distance from S2 to Polygon v#3 is 1.32809
15    Distance from S2 to Polygon v#4 is 2.17123
16    Distance from S2 to Polygon v#5 is 2.69025
17    Distance from S2 to Polygon v#6 is 2.59536
18    Distance from S2 to Polygon v#7 is 1.86815
19    ==================================================
20    Distance from R1 to Polygon v#0 is 0.824621
21    Distance from R1 to Polygon v#1 is 0.177443
22    Distance from R1 to Polygon v#2 is 1.02986
23    Distance from R1 to Polygon v#3 is 1.73992
24    Distance from R1 to Polygon v#4 is 2.10137
25    Distance from R1 to Polygon v#5 is 2.04839
26    Distance from R1 to Polygon v#6 is 1.59165
27    Distance from R1 to Polygon v#7 is 0.824621
28    Distance from R2 to Polygon v#0 is 1.21655
29    Distance from R2 to Polygon v#1 is 1.28146
30    Distance from R2 to Polygon v#2 is 1.17514
31    Distance from R2 to Polygon v#3 is 1.01737
32    Distance from R2 to Polygon v#4 is 0.436268
33    Distance from R2 to Polygon v#5 is 0.557561
34    Distance from R2 to Polygon v#6 is 1.0083
35    Distance from R2 to Polygon v#7 is 1.21655
36    ==================================================
37    Distance from L1 to Polygon v#0 is 1
38    Distance from L1 to Polygon v#1 is 0.942178
39    Distance from L1 to Polygon v#2 is 0.376563
40    Distance from L1 to Polygon v#3 is 0.647576
41    Distance from L1 to Polygon v#4 is 1.09225
42    Distance from L1 to Polygon v#5 is 1
43    Distance from L1 to Polygon v#6 is 1
44    Distance from L1 to Polygon v#7 is 1
45    Distance from L2 to Polygon v#0 is 0.707107
46    Distance from L2 to Polygon v#1 is 1.55286
47    Distance from L2 to Polygon v#2 is 2.1821
48    Distance from L2 to Polygon v#3 is 2.10977
49    Distance from L2 to Polygon v#4 is 1.57216
50    Distance from L2 to Polygon v#5 is 0.705646
51    Distance from L2 to Polygon v#6 is 0.302983
52    Distance from L2 to Polygon v#7 is 0.707106
53    ==================================================
```