심화전공실습 1

#09. Lights and Materials

Self-scoring table

	P1	P2	P3	P4	E1	Total
Score	1	1	1	1	1	5

이름 최영찬

학번 2016603042

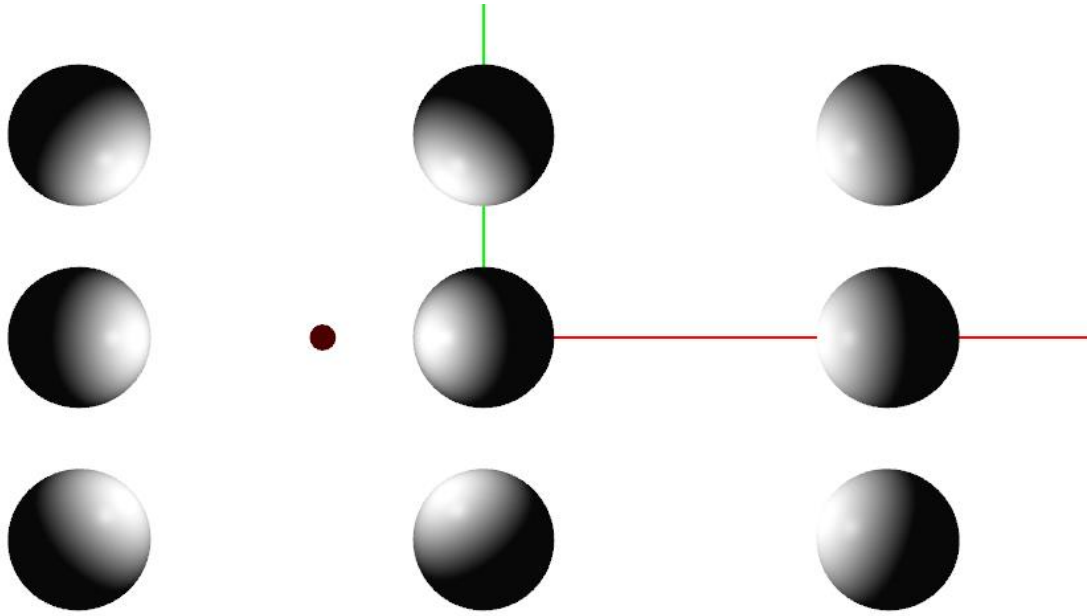
학과 수학과

제출일 2020.11.01.

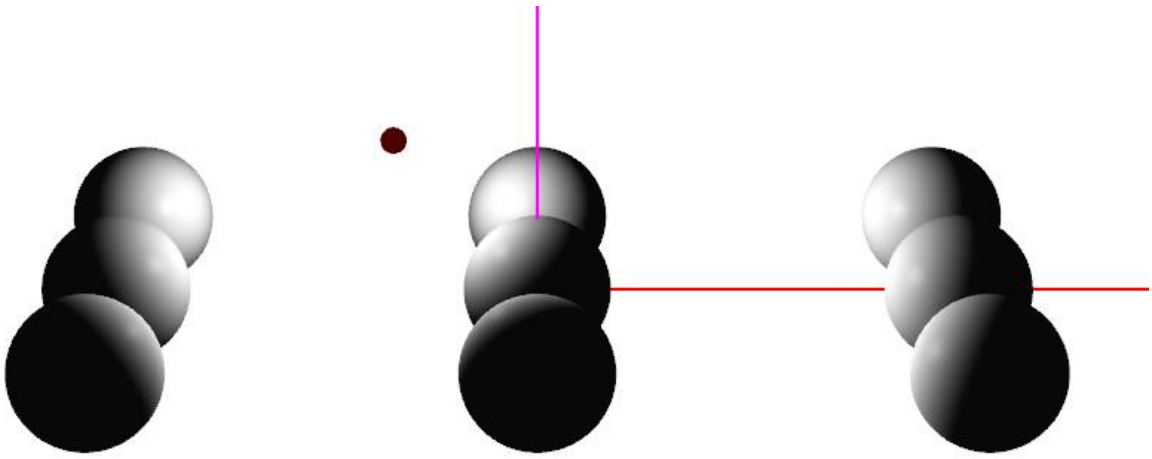
Practice

1. A point light rotating around 3x3 spheres

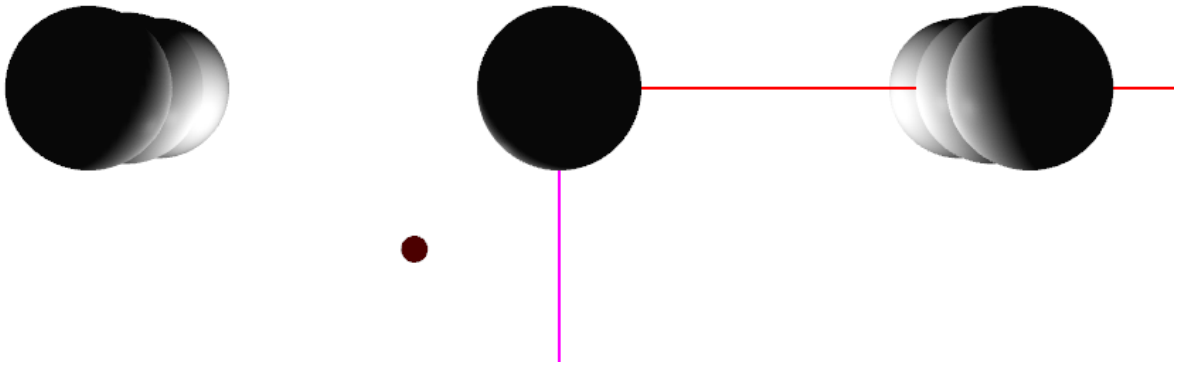
Frontview



Birdview

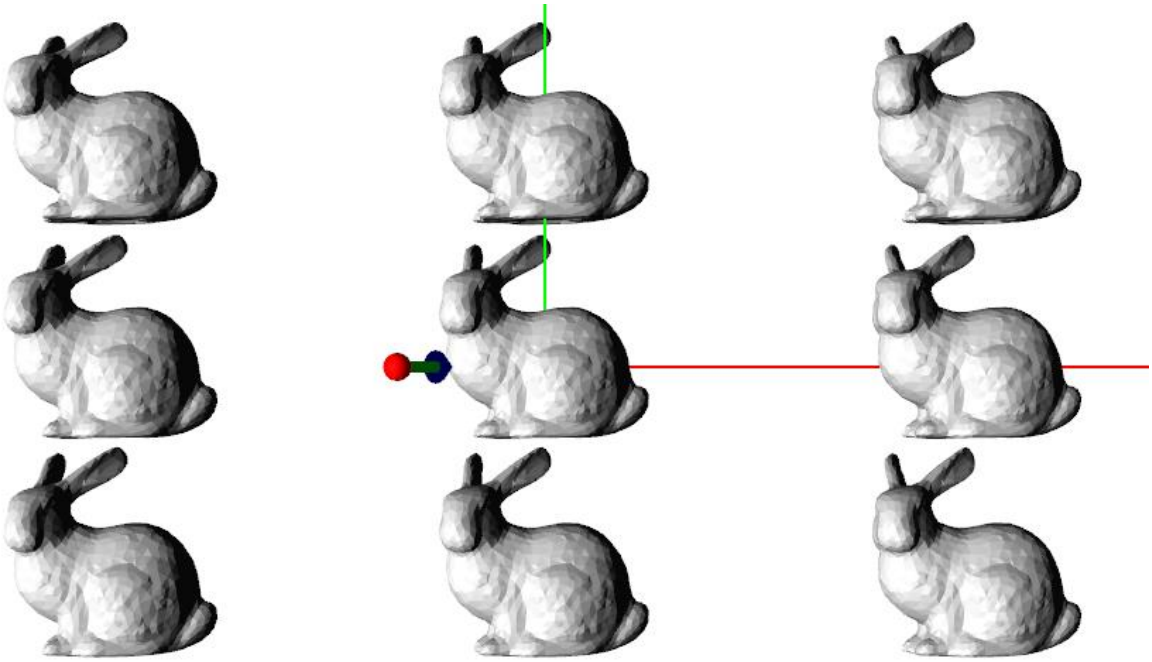


Topview

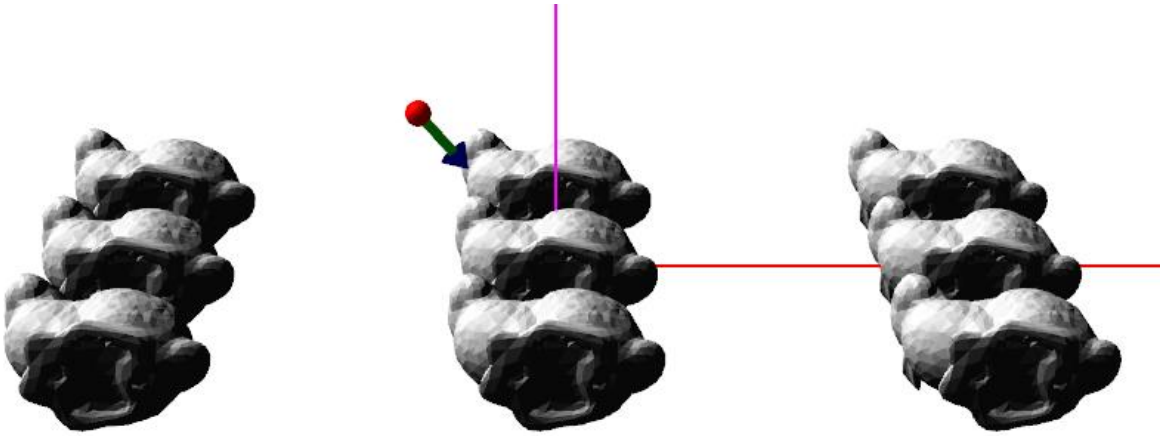


2. A distant light rotating around 3x3 flat bunnies

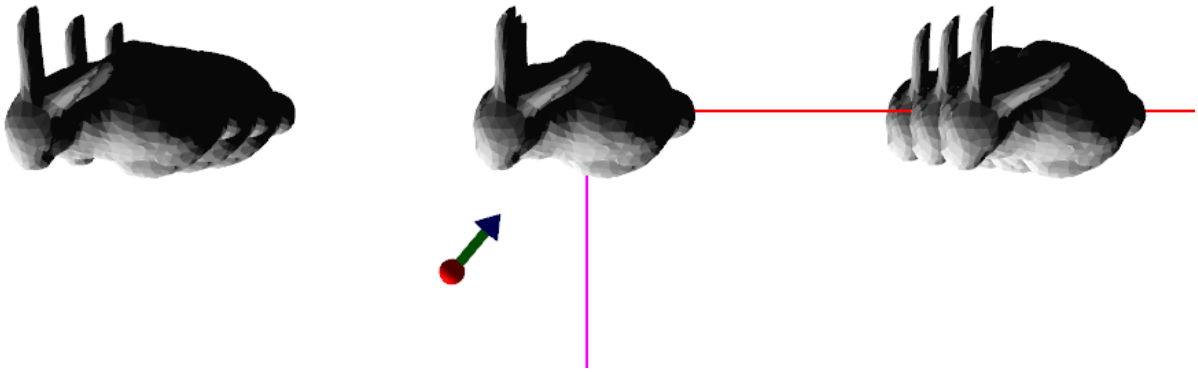
Frontview



Birdview

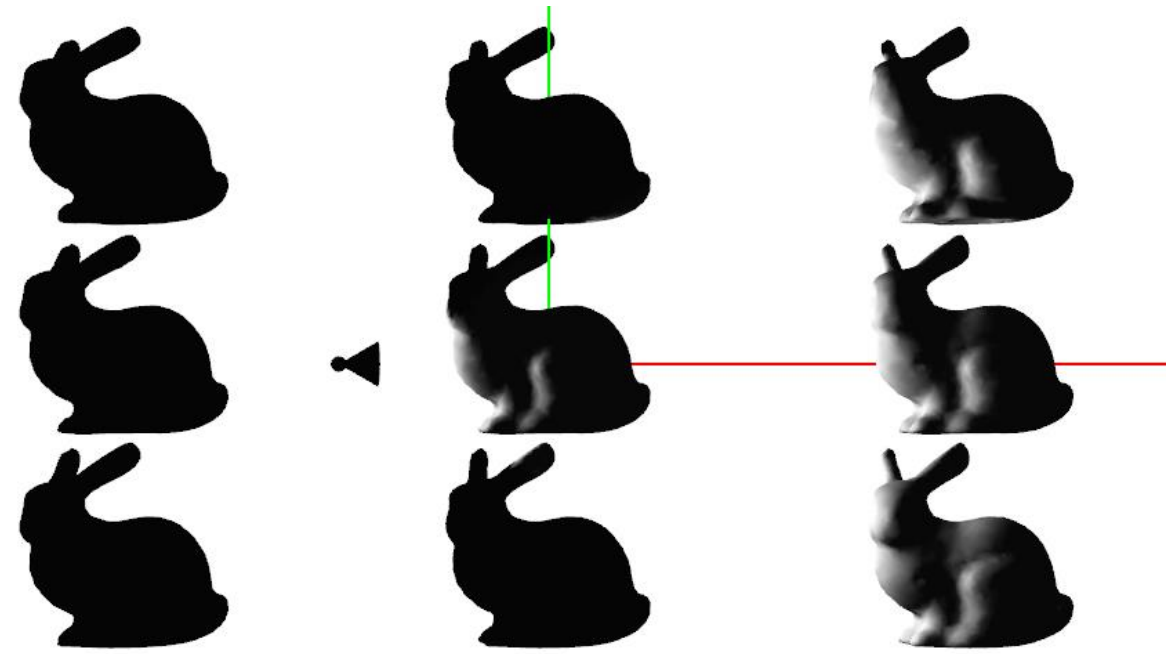


Topview

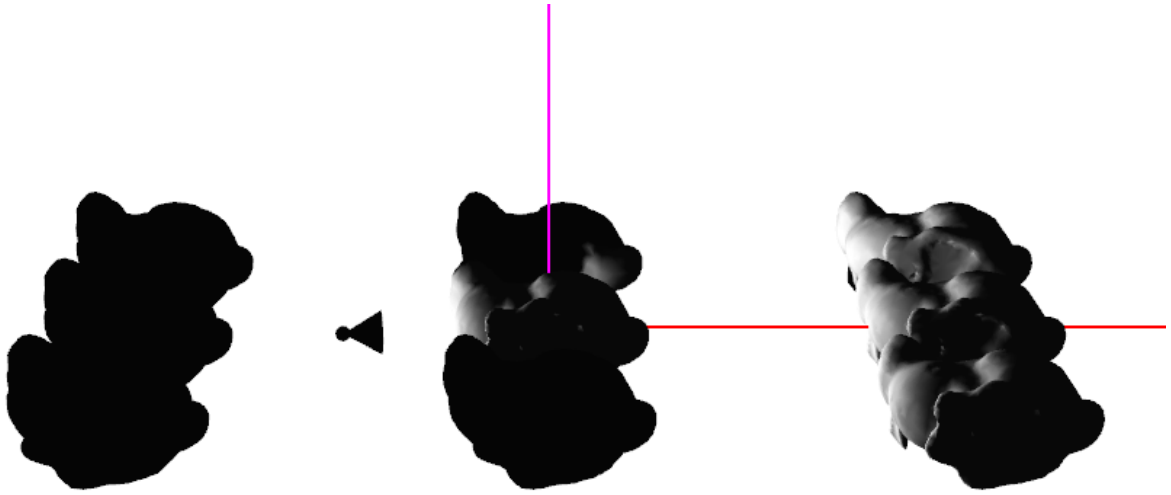


3. A spot light rotating around 3x3 smooth bunnies

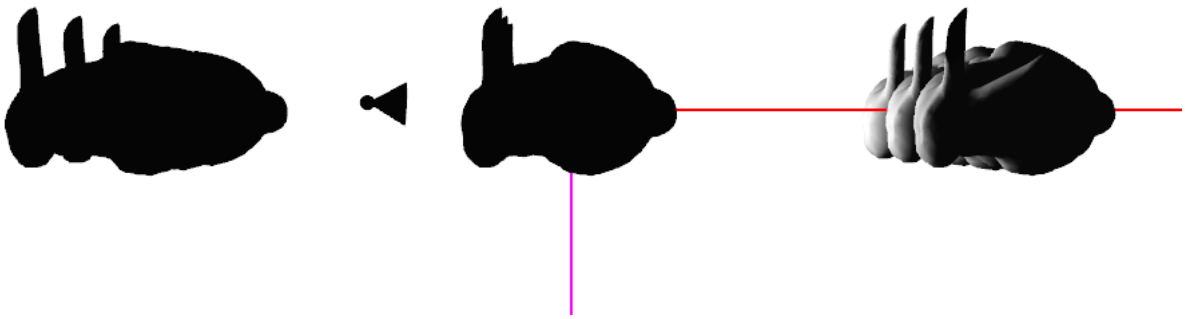
Frontview



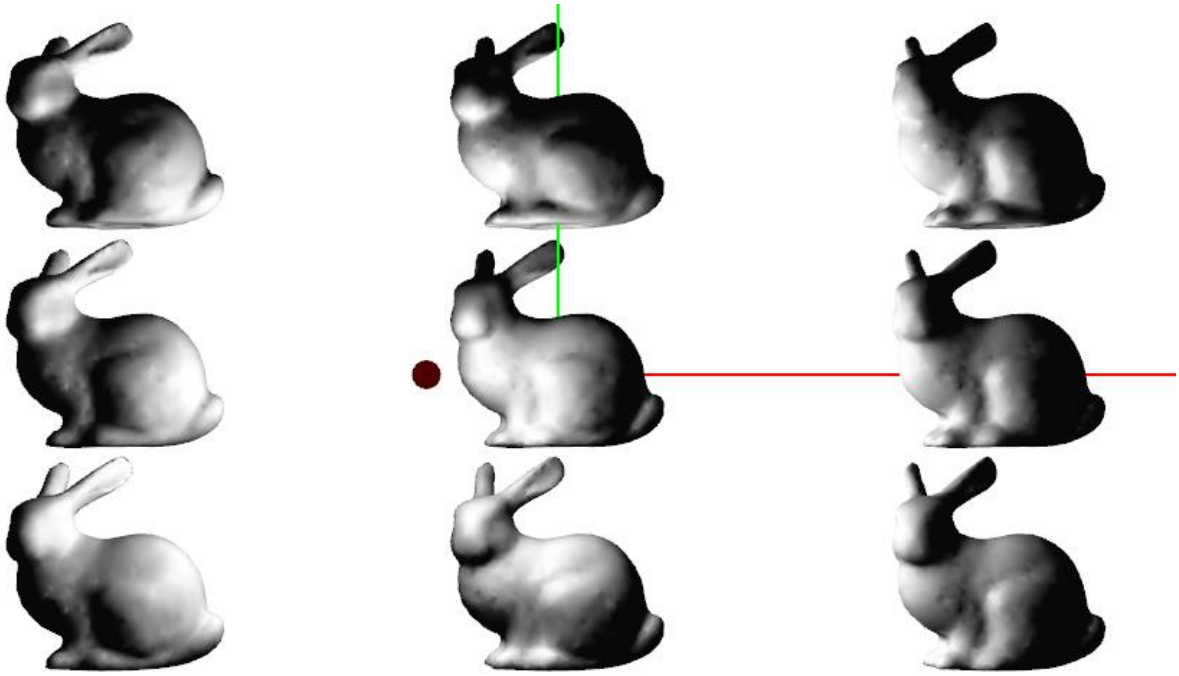
Birdview



Topview



4. 3 predefined material parameters



Exercise

1. Adjust the shininess coefficient of a point light on 3x3 spheres using the arrow keys

```
float timeStep = 1.0f / 120;
float period = 4.0f;
float shine = 25.0f;
```

Shininess 계수를 Arrow key 로 조절 할 수 있도록 shine 을 정의해준다.

```
void
setupWhiteShinyMaterial()
{
    GLfloat mat_ambient[4] = { 0.1f,0.1f,0.1f,1.0f };
    GLfloat mat_diffuse[4] = { 1.0f,1.0f,1.0f,1.0f };
    GLfloat mat_specular[4] = { 1.0f,1.0f,1.0f,1.0f };
    GLfloat mat_shininess = shine;

    glMaterialfv(GL_FRONT_AND_BACK, GL_AMBIENT, mat_ambient);
    glMaterialfv(GL_FRONT_AND_BACK, GL_DIFFUSE, mat_diffuse);
    glMaterialfv(GL_FRONT_AND_BACK, GL_SPECULAR, mat_specular);
    glMaterialf(GL_FRONT_AND_BACK, GL_SHININESS, mat_shininess);
}
```

```
void
setupBrassMaterial()
{
    GLfloat mat_ambient[4] = { 0.33f,0.22f,0.33f,1.0f };
    GLfloat mat_diffuse[4] = { 0.78f,0.57f,0.11f,1.0f };
    GLfloat mat_specular[4] = { 0.99f,0.91f,0.81f,1.0f };
    GLfloat mat_shininess = shine;

    glMaterialfv(GL_FRONT_AND_BACK, GL_AMBIENT, mat_ambient);
    glMaterialfv(GL_FRONT_AND_BACK, GL_DIFFUSE, mat_diffuse);
    glMaterialfv(GL_FRONT_AND_BACK, GL_SPECULAR, mat_specular);
    glMaterialf(GL_FRONT_AND_BACK, GL_SHININESS, mat_shininess);
}
```

```
void
setupRedPlasticMaterial()
{
    GLfloat mat_ambient[4] = { 0.3f,0.0f,0.0f,1.0f };
    GLfloat mat_diffuse[4] = { 0.6f,0.0f,0.0f,1.0f };
    GLfloat mat_specular[4] = { 0.8f,0.6f,0.6f,1.0f };
    GLfloat mat_shininess = shine;

    glMaterialfv(GL_FRONT_AND_BACK, GL_AMBIENT, mat_ambient);
    glMaterialfv(GL_FRONT_AND_BACK, GL_DIFFUSE, mat_diffuse);
    glMaterialfv(GL_FRONT_AND_BACK, GL_SPECULAR, mat_specular);
    glMaterialf(GL_FRONT_AND_BACK, GL_SHININESS, mat_shininess);
}
```

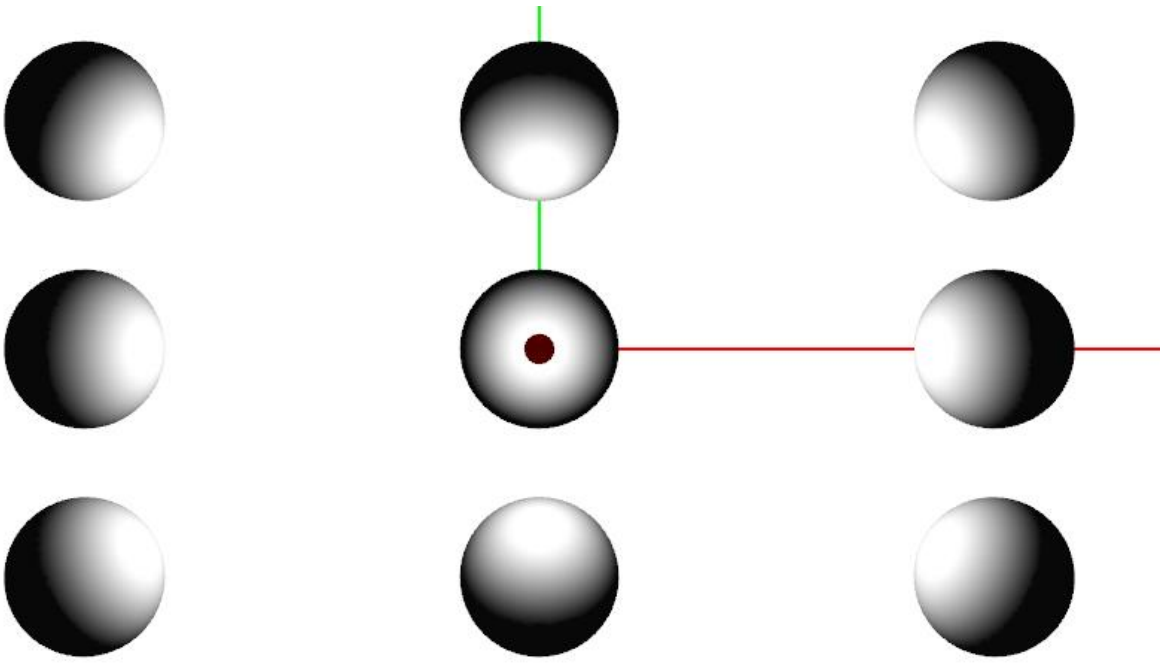
각 계수를 shine 으로 바꾼다.

```
case GLFW_KEY_RIGHT: shine += 0.1f;
    cout << shine << endl; break;
case GLFW_KEY_LEFT:shine = (float)std::max(shine - 0.1, 0.1);
    cout << shine << endl; break;
```

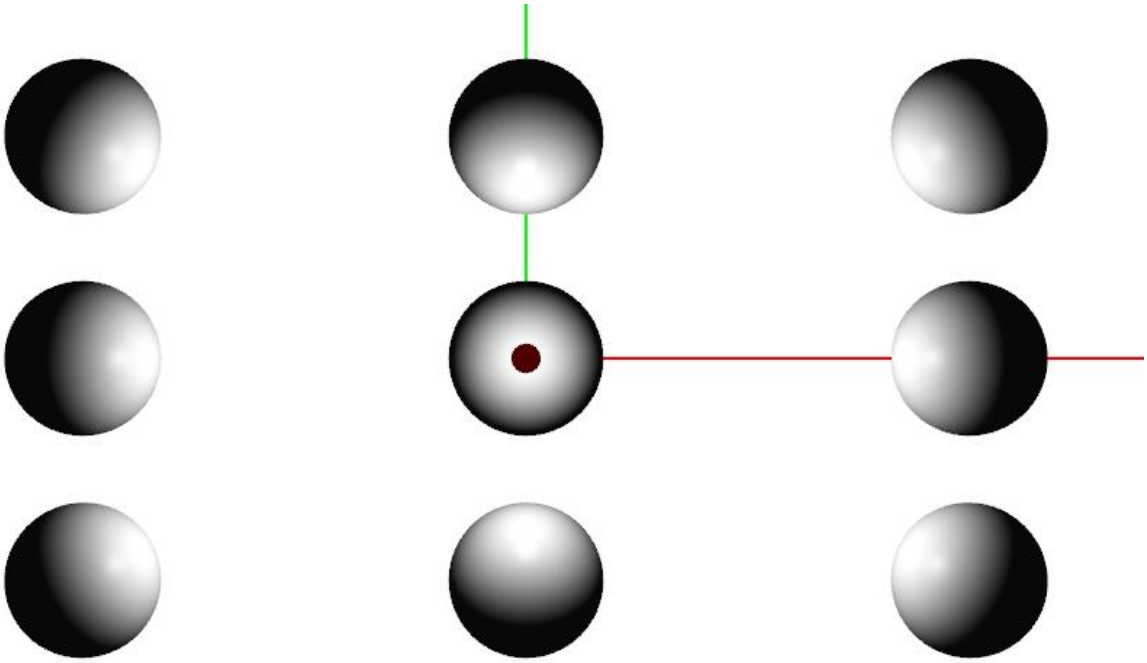
LEFT Key 를 누르면 shine 이 줄고, RIGHT Key 를 누르면 shine 이 커지도록 하여 Shininess 계수를 조절 할 수 있게한다.

```
88.9992
89.0992
89.1992
89.2992
89.3992
89.4992
89.5992
89.6992
89.7992
89.8992
89.9992
90.0992
```

또한 현재 Shininess 계수를 확인할 수 있도록 누를 때마다 shine 수치를 출력하도록 했다.



Shininess=1



Shininess=90

Shininess 가 90 일 때 보다 1 일때 밝은 부분이 더 넓다.

즉 Shininess 가 더 낮을 수록 밝기스팟의 크기가 더 커진다는 것을 의미한다.