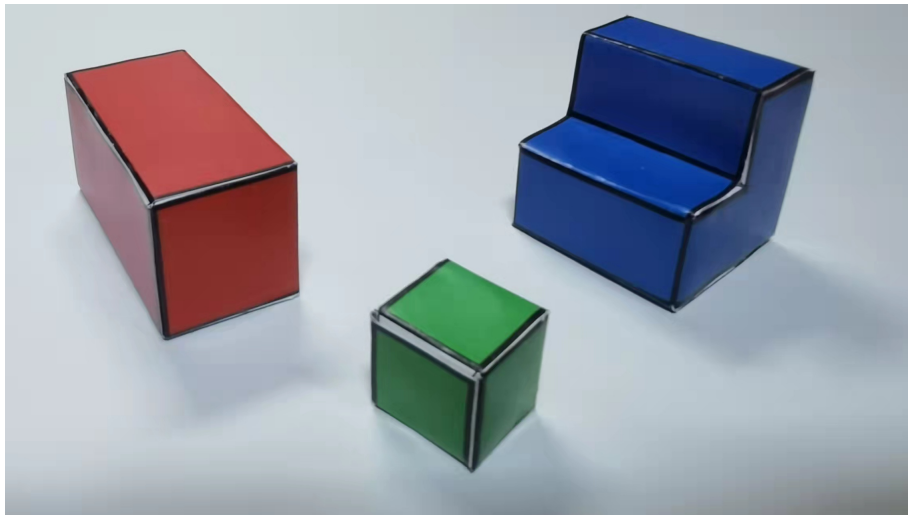


问题包-1

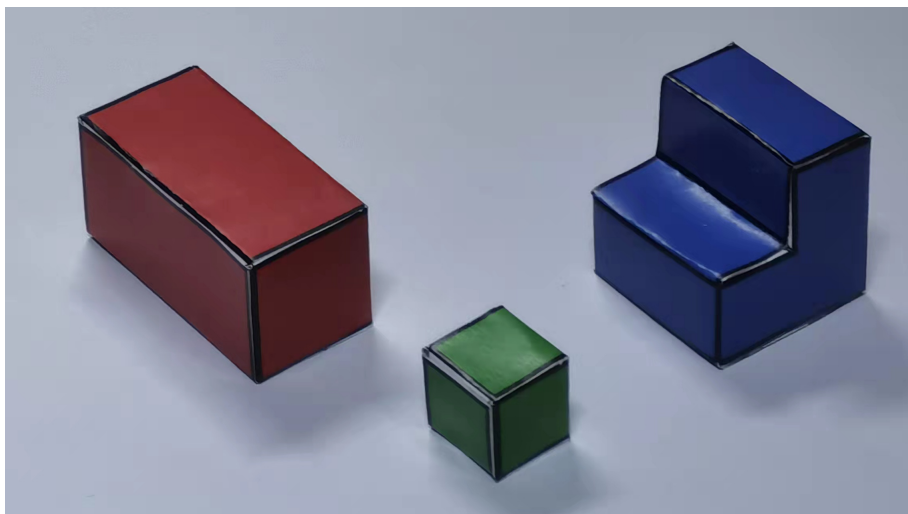
问题2

通过自制simple world, 拍摄得如下图片

- 透视投影



- 正交投影

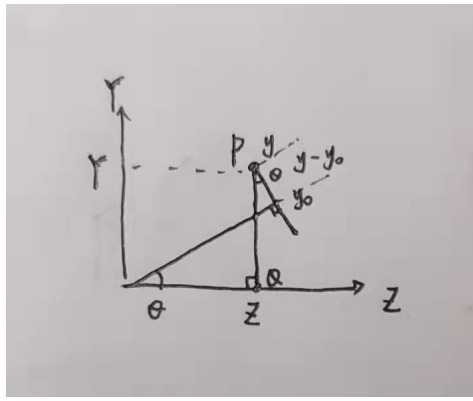


问题3

由于x轴与x轴平行, 故x轴只有缩放变换 (缩放因子为 α)

$$x - x_0 = \alpha X \Rightarrow x = \alpha X + x_0$$

对于y轴, 如图, 考虑线段PQ



$$\alpha Y = \alpha Z \tan \theta + \frac{y - y_0}{\cos \theta} \Rightarrow y = \alpha(\cos \theta Y - \sin \theta Z) + y_0$$

问题4

$$\frac{\partial Z}{\partial y} = -1/\sin \theta \quad (\text{对问题3中证明的第二个方程求偏导可得})$$

$$\frac{\partial Z}{\partial \mathbf{t}} = \nabla Z \times \mathbf{t} = -n_y \frac{\partial Z}{\partial x} + n_x \frac{\partial Z}{\partial y} = 0, \quad \mathbf{t} = (-n_y, n_x)$$

$$\frac{\partial^2 Z}{\partial x^2} = 0$$

$$\frac{\partial^2 Z}{\partial y^2} = 0$$

$$\frac{\partial^2 Z}{\partial x \partial y} = 0$$

问题5

- 代码补全

```
% 166
Aij(:, :, c) = [-1 0 1; -2 0 2; -1 0 1]*-dy+[-1 -2 -1; 0 0 0; 1 2 1]*dx;
% 180
Aij(:, :, c) = 0.1*[0 -1 0; 0 2 0; 0 -1 0];
```

- 运行结果

