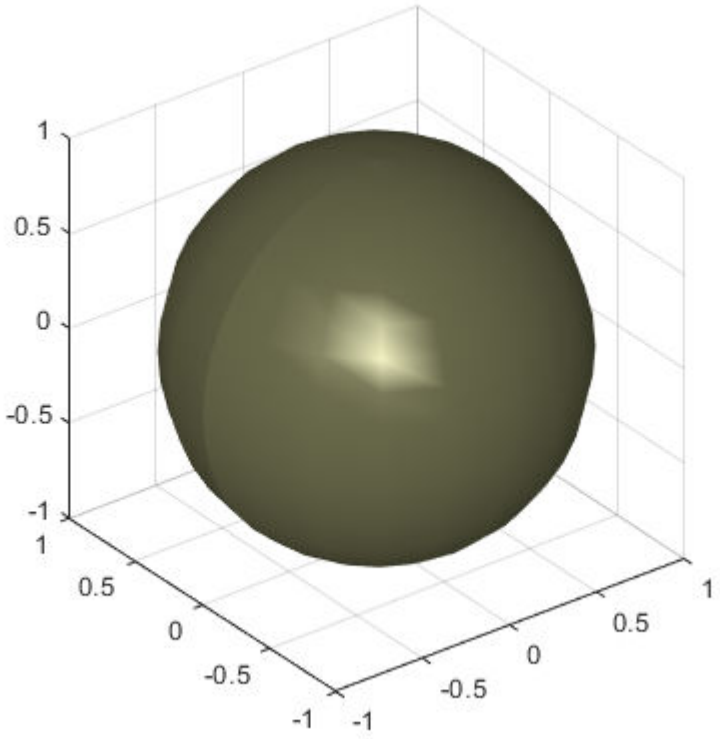
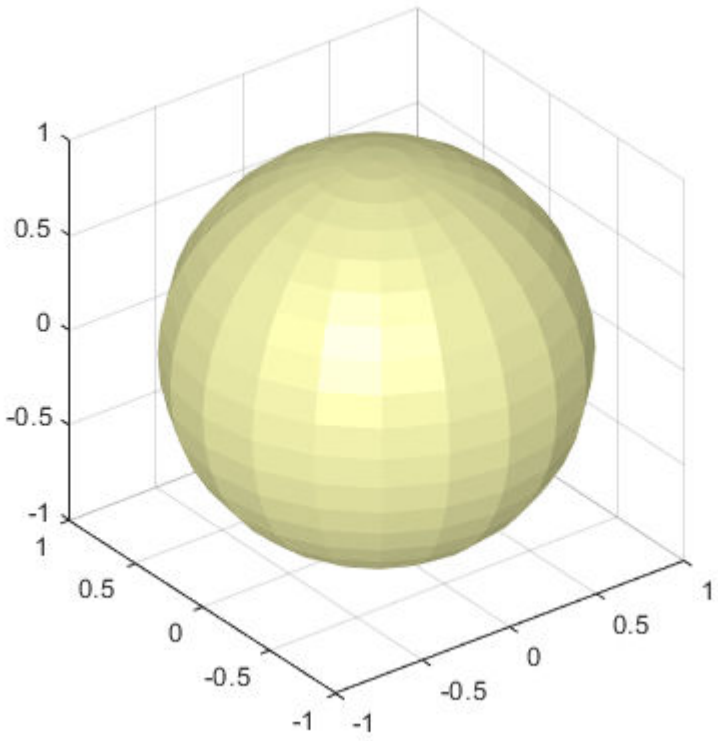
```
figure,
[X,Y,Z] = sphere();
surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.5],'LineStyle', 'none');
lightangle(-45,30);
lighting gouraud;
%lighting flat;
%material shiny;
material metal;
%material dull
axis equal;
```

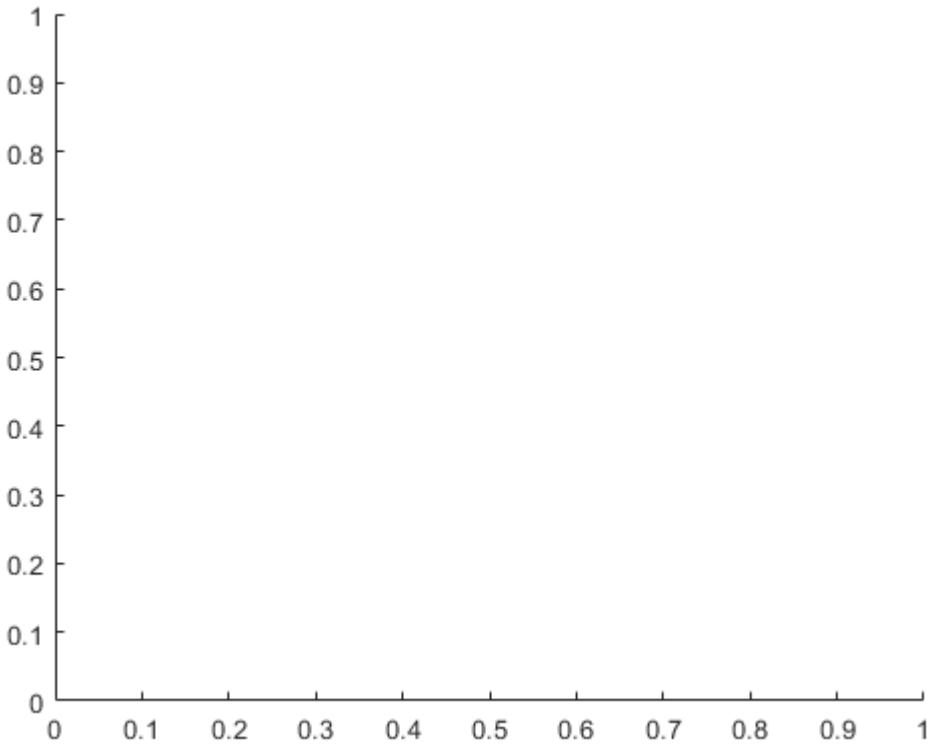



```
figure,
[X,Y,Z] = sphere();
s = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.5],'LineStyle', 'none');
lightangle(-45,30);
s.SpecularStrength = 0.297;
s.SpecularColorReflectance = 0.5;

s.AmbientStrength = 0.8;
axis equal;
```



`material([ka kd ks n sc])` sets the ambient/diffuse/specular strength, specular exponent, and specular color reflectance of the objects.

```
[X,Y,Z] = sphere();
figure,

lightangle(-45,30);
```

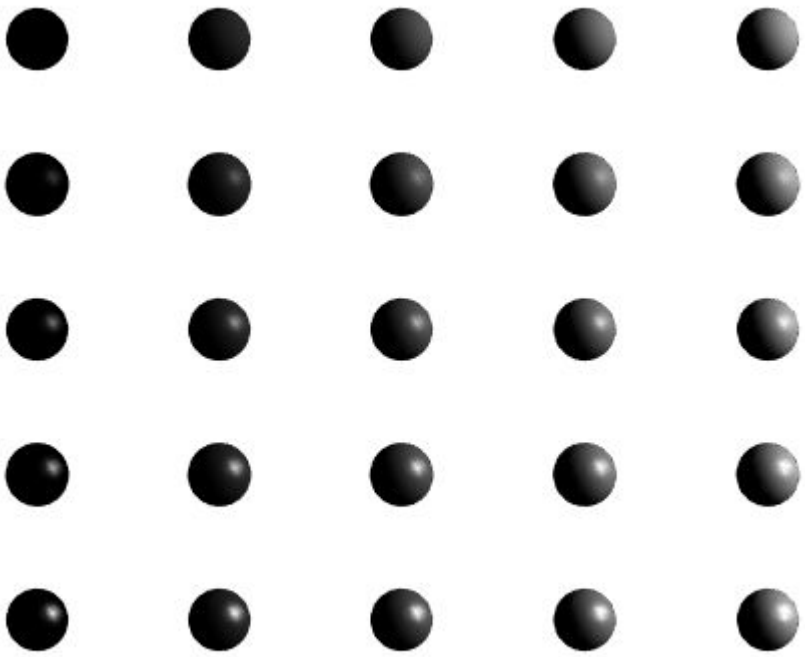



```
lighting gouraud;

% nic
subplot(1,5,1),
s = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.7],'LineStyle', 'none');
material(s, [0 0 0]);
axis equal;
axis off;
lightangle(-45,30);
lighting gouraud;

% ambient
subplot(1,5,2),
s2 = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.7],'LineStyle', 'none');
material(s2, [0.5 0 0]);
axis equal;
axis off;
lightangle(-45,30);
lighting gouraud;

% diffuse
subplot(1,5,3),
s2 = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.7],'LineStyle', 'none');
material(s2, [0 0.5 0]);
axis equal;
axis off;
lightangle(-45,30);
lighting gouraud;
```

```
% specular
subplot(1,5,4),
s3 = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.7],'LineStyle', 'none');
material(s3, [0 0 0.5]);
axis equal;
axis off;
lightangle(-45,30);
lighting gouraud;

% vše
subplot(1,5,5),
s4 = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.7],'LineStyle', 'none');
material(s4, [0.5 0.5 0.5]);
axis equal;
axis off;
lightangle(-45,30);
lighting gouraud;
```

```
figure,
index = 1;
for i = 0 : 0.25 : 1
    for j = 0 : 0.25 : 1
        subplot(5,5,index),
        index = index + 1;
```

```
        s = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.7],'LineStyle', 'none');
        material(s, [0 j i]);
        axis equal;
        axis off;
        lightangle(45,30);
        lighting gouraud;
    end
end
```



Diffuse -- různý úhel pozorovatele

```
figure,
for i = 1 : 6
    subplot(1,6,i),
    index = index + 1;
    s = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.7],'LineStyle', 'none');
    material(s, [0 1 0]);
    axis equal;
    axis off;
    lightangle(0,30);
    view([-90 + (180/5) *(i - 1 ), 10]);
    lighting gouraud;
end
```

Specular -- různý úhel pozorovatele

```
figure,
for i = 1 : 6
    subplot(1,6,i),
    index = index + 1;
    s = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.7],'LineStyle', 'none');
    material(s, [0 0 1]);
    axis equal;
    axis off;
    lightangle(0,30);
    view([-90 + (180/5) *(i - 1 ), 10]);
    lighting gouraud;
end
```

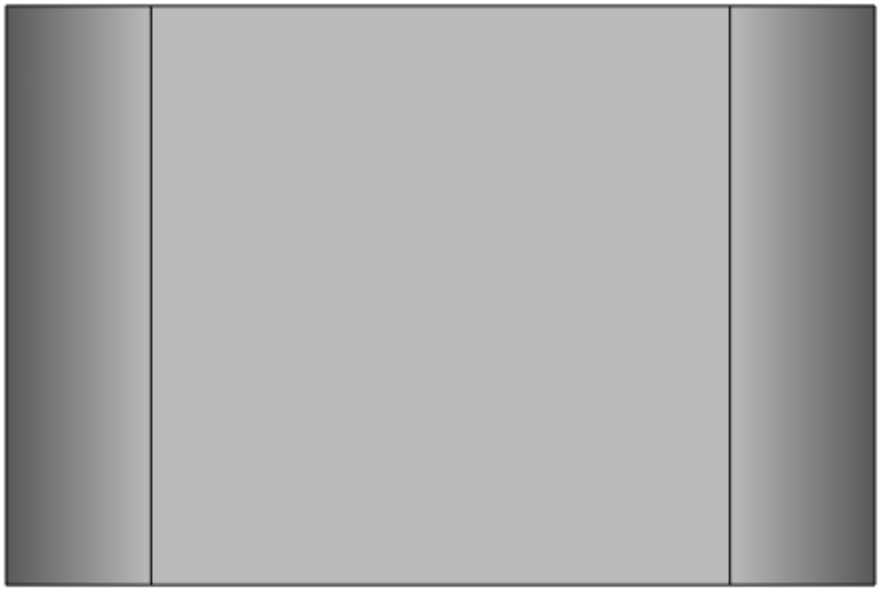
Specular -- různé n

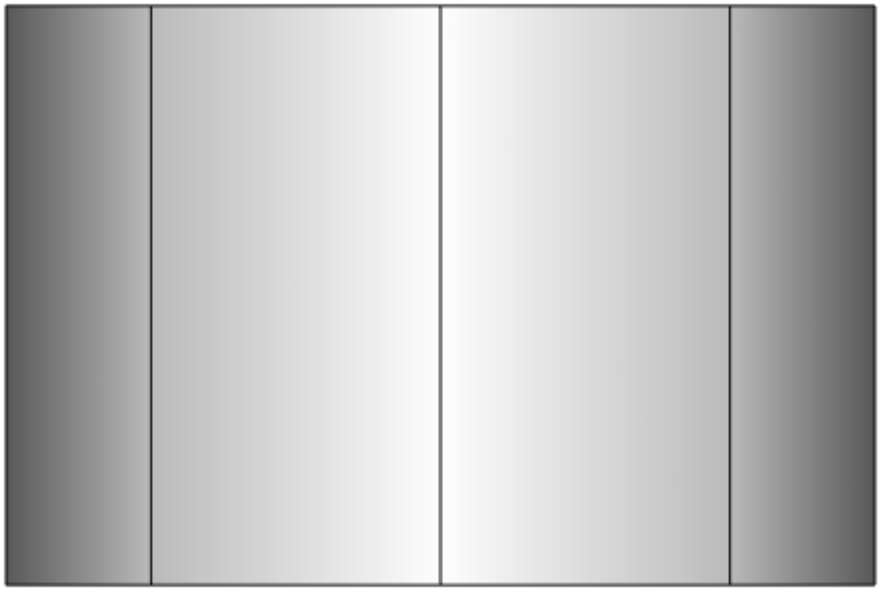
```
figure,
for i = 1 : 6
    subplot(1,6,i),
    index = index + 1;
    s = surf(X,Y,Z, 'FaceColor',[0.7 0.7 0.7],'LineStyle', 'none');
    material(s, [0 0 1, i*5]);
    axis equal;
    axis off;
    lightangle(0,45);
    view([45,45]);
    lighting gouraud;
end
```

```
figure,
robot = stlread('pawn.stl');
trisurf(robot, 'FaceColor', [0.8 0.8 0.8], 'EdgeColor', 'none');
lightangle(45,10);
lighting flat;
%lighting phong;
%lighting gouraud;
material default;
axis equal;
axis off;
```

Gouraud problem

```
X = [-15 -10 10 15; -15 -10 10 15];
Y = [-10 -10 -10 -10; 10 10 10 10];
Z = [-1 0 0 -1; -2 -1 -1 -2];

figure,
surf(X,Y,Z, 'FaceColor', [0.2 0.2 0.2]);
%surf(X,Y,Z, 'FaceColor', [0.2 0.2 0.2], 'EdgeColor', 'none');
lightangle(90,90);
 view([0,90]);
 material shiny;
 lighting gouraud;
 axis equal;
 axis off;
```



Gouraud problem

```
X = [-15 -10 0 10 15; -15 -10 0 10 15];
Y = [-10 -10 -10 -10 -10; 10 10 10 10 10];
Z = [-1 0 0 0 -1; -2 -1 -1 -1 -2];

figure,
surf(X,Y,Z, 'FaceColor', [0.2 0.2 0.2]);
%surf(X,Y,Z, 'FaceColor', [0.2 0.2 0.2], 'EdgeColor', 'none');

lightangle(90,90);
 view([0,90]);
 material shiny;
 lighting gouraud;
 axis equal;
 axis off;
```