Definice funkce g(x,t)

```
function g = priklad_ap1_g(x,t)
   if (x==0)
     g = 3;
   else
     g = 1;
   end
end
```

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Definice funkce e(x,t)

```
function e = priklad_ap1_e(x,t)
   if (x==0)
     e = 0;
   else
     e = 2/x;
   end
end
```

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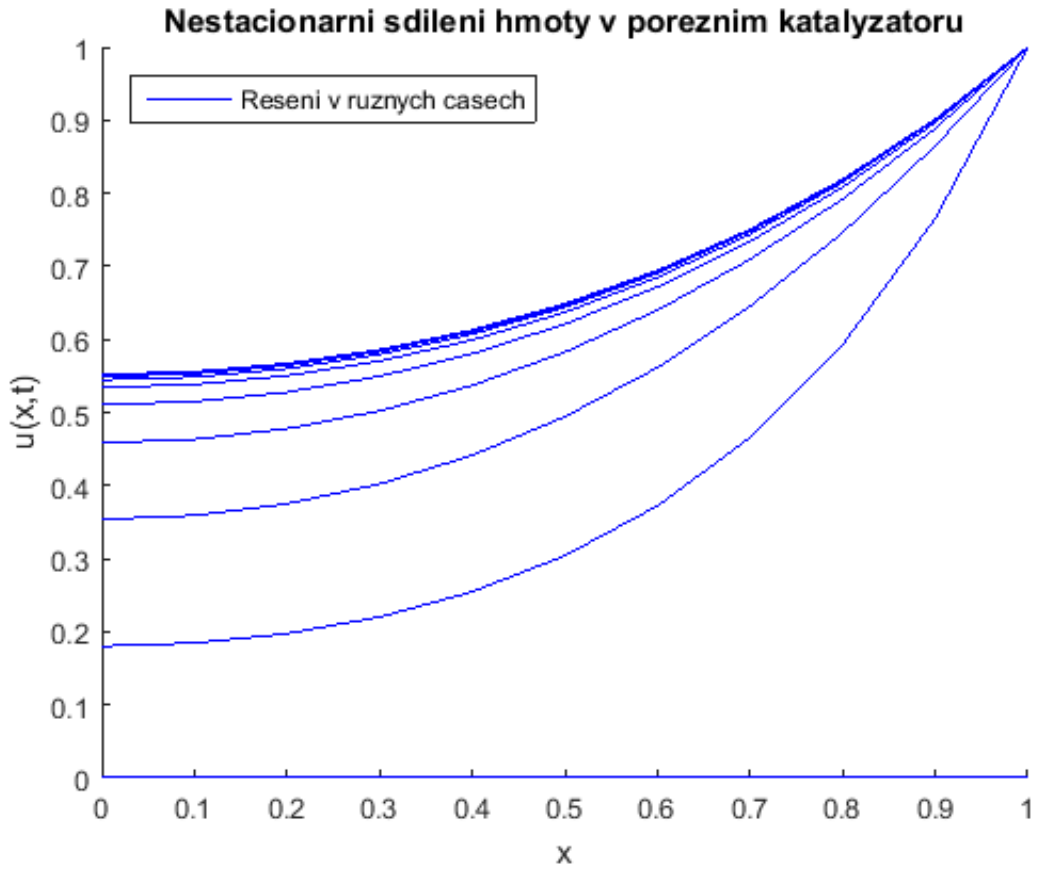
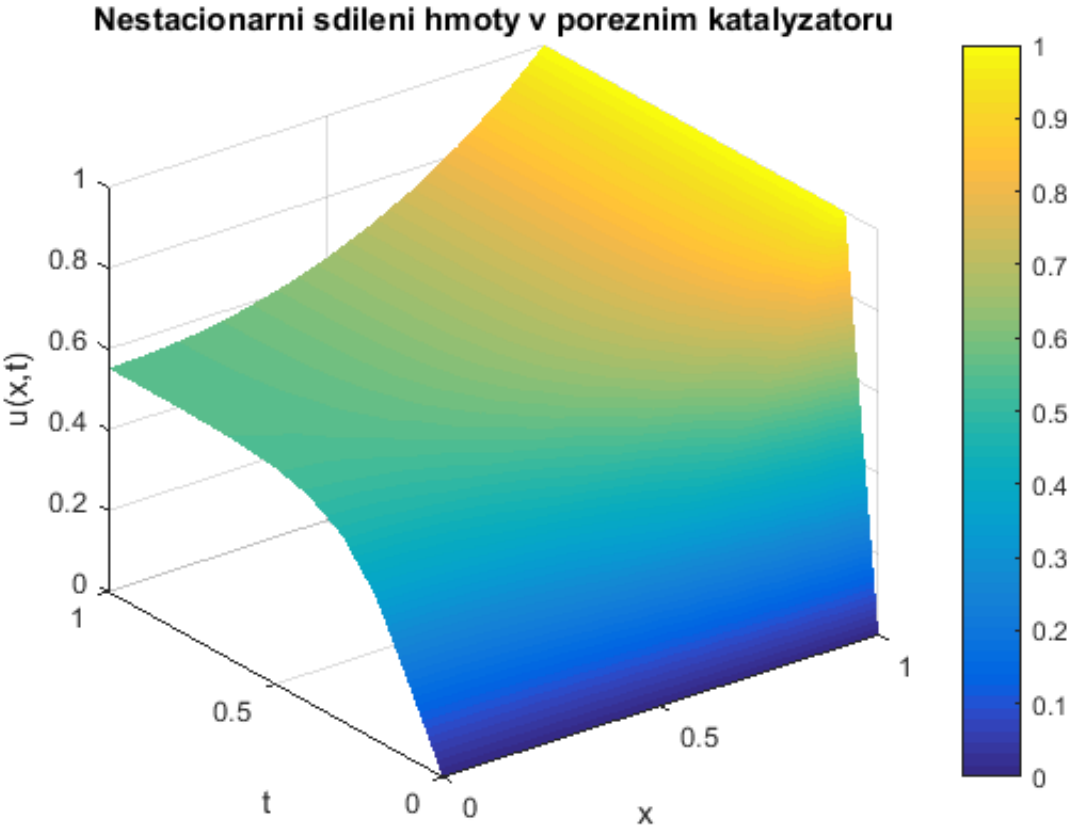
Aplikační příklad 2.1

```
% Nestacionarni sdileni hmoty v poreznim katalyzatoru ve tvaru kulicky
% du/dt = d2u/dx2 + 2/x* du/dx - phi^2 * u
% du/dx(0,t) = 0, u(1,t) = 1
% u(x,0) = 0
% phi = 2

a = 0;
b = 1;
n = 10;
h = (b-a)/n;
m = 10;
k = 0.1;
g = inline('1','x','t');
e = inline('0','x','t');
f = inline('-4*u','x','t','u');
df = inline('-4','x','t','u');
alpha1 = 0;
beta1 = inline('1','t');
gamma1 = inline('0','t');
alpha2 = 1;
beta2 = inline('0','t');
gamma2 = inline('1','t');
phi = inline('0','x');

u = PDEParabImpl(n,m,k,a,b,@priklad_ap1_g,@priklad_ap1_e,f,df,alpha1,alpha2,beta1,beta2,gamma1,
gamma2,phi);

h = (b-a)/n; x = a:h:b; t = (0:k:m*k)';
figure;
hold on;
for j = 1:m+1
  plot(x,u(j,:),'b');
end
title({'Nestacionarni sdileni hmoty v poreznim katalyzatoru'});
xlabel('x');
ylabel('u(x,t)');
legend('Reseni v ruznych casech','Location','Northwest');
hold off;

figure;
surf(x,t,u);
shading interp;
colorbar;
xlabel('x');
ylabel('t');
zlabel('u(x,t)');
title('Nestacionarni sdileni hmoty v poreznim katalyzatoru');
```


Nestacionarni sdileni hmoty v poreznim katalyzatoru
Reseni v ruznych casech
u(x,t)
x
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


Nestacionarni sdileni hmoty v poreznim katalyzatoru
u(x,t)
t
x
0
0.2
0.4
0.6
0.8
1
0.5