

## Contents

### ■ SECTION TITLE

```
% This script file computes for the transport equation  $u_t + cu_x = 0$  the  
% followings: solution, characteristics
```

```
close all;  
clear all;
```

```
speed=1;%input('Input the propagation speed ')
```

## SECTION TITLE

Define the initial function

```
f_initial=@(x)exp(-2*(x-1).^2);
```

```
% Calculate and plot the solution in 3D
```

```
x=0:.1:8;
```

```
t=0:.1:5;
```

```
[X,Y]=meshgrid(x,t);
```

```
solution_u=@(x,t,c)f_initial(x-c*t);
```

```
Z=solution_u(X,Y,speed);
```

```
%mesh(X,Y,Z); %mesh plot
```

```
surf(X,Y,Z); %surface plot
```

```
xlabel('x','FontSize',14);
```

```
ylabel('t','FontSize',14);
```

```
zlabel('u','FontSize',14);
```

```
title('Solution u(x,t) of the transport equation with constant c')
```

**Solution  $u(x,t)$  of the transport equation with constant  $c$**

