```
Quit[];

(* MATRICI TRIDIAGONALI *)

(* ESERCIZIO 6.6.6a *)

n = 3;
a = {{1, -1, 0, 0}, {-2, 4, -2, -1}, {0, -1, 2, 1.5}};
MatrixForm[a]
```

$$\begin{pmatrix} 1 & -1 & 0 & 0 \\ -2 & 4 & -2 & -1 \\ 0 & -1 & 2 & 1.5 \end{pmatrix}$$

```
l[1][1] = a[[1]][[1]];
u[1][2] = a[[1]][[2]] / l[1][1];
z[1] = a[[1]][[n + 1]] / l[1][1];

For[i = 2, i ≤ n - 1, i++, l[i][i - 1] = a[[i]][[i - 1]];
 l[i][i] = a[[i]][[i]] - l[i][i - 1] * u[i - 1][i];
 u[i][i + 1] = a[[i]][[i + 1]] / l[i][i];
 z[i] = (a[[i]][[n + 1]] - l[i][i - 1] * z[i - 1]) / l[i][i]
]
l[n][n - 1] = a[[n]][[n - 1]];
l[n][n] = a[[n]][[n]] - l[n][n - 1] * u[n - 1][n];
z[n] = (a[[n]][[n + 1]] - l[n][n - 1] * z[n - 1]) / l[n][n];

Clear[x];
x[n] = z[n];

For[i = n - 1, i ≥ 1, i--, x[i] = z[i] - u[i][i + 1] * x[i + 1]]

For[i = 1, i ≤ n, i++, Print[x[i]]]
```

```
0.5

0.5

1.
```

```
a1 = {{1, -1, 0}, {-2, 4, -2}, {0, -1, 2}};
b = {0, -1, 1.5};
x = {x1, x2, x3};
Solve[Dot[a1, x] == b, x]
```

```
{{x1 → 0.5, x2 → 0.5, x3 → 1.}}
```

```
(* ESERCIZIO 6.6.6d *)
```

```
n = 3;
a = {{1, -1, 0, 0}, {-2, 4, -2, -1}, {0, -1, 2, 1.5}};
MatrixForm[a]
```

$$\begin{pmatrix} 1 & -1 & 0 & 0 \\ -2 & 4 & -2 & -1 \\ 0 & -1 & 2 & 1.5 \end{pmatrix}$$

```
l[1][1] = a[[1]][[1]];
u[1][2] = a[[1]][[2]] / l[1][1];
z[1] = a[[1]][[n + 1]] / l[1][1];

For[i = 2, i ≤ n - 1, i++, l[i][i - 1] = a[[i]][[i - 1]];
 l[i][i] = a[[i]][[i]] - l[i][i - 1] * u[i - 1][i];
 u[i][i + 1] = a[[i]][[i + 1]] / l[i][i];
 z[i] = (a[[i]][[n + 1]] - l[i][i - 1] * z[i - 1]) / l[i][i]
]
l[n][n - 1] = a[[n]][[n - 1]];
l[n][n] = a[[n]][[n]] - l[n][n - 1] * u[n - 1][n];
z[n] = (a[[n]][[n + 1]] - l[n][n - 1] * z[n - 1]) / l[n][n];

Clear[x];
x[n] = z[n];

For[i = n - 1, i ≥ 1, i--, x[i] = z[i] - u[i][i + 1] * x[i + 1]]

For[i = 1, i ≤ n, i++, Print[x[i]]]
```

```
0.5

0.5

1.
```

```
a1 = {{1, -1, 0}, {-2, 4, -2}, {0, -1, 2}};
b = {0, -1, 1.5};
x = {x1, x2, x3};
Solve[Dot[a1, x] == b, x]
```

```
{{x1 → 0.5, x2 → 0.5, x3 → 1.}}
```