```matlab
%%%% Code starts %%%%
function[sencrypt,sdecrypt]=q1_1226347696(s,m)
%first we check the number of characters
k = length(s);
%we give the key
%now after comparing we pad sufficient characters
[R,C]=size(m);
P= ceil(k/R);
disp(k);
disp(P);
q=((P*R)-k);
%now q is the required padding and we pad with '*'
disp(q);
if q~=0
    for i=1:q
        s = append(s,'*');
    end
end
disp(s);
%after getting required char we encrypt
nnumb = reshape(double(s),R,P);
disp(nnumb);
ncode = mod(m*(nnumb-32),95)+32;
scode = reshape(char(ncode),1,(R*P));
disp(scode);
%now we remove the excess element and start decrypting
sencrypt = scode(1:end-q);
disp(sencrypt);
ncode = reshape(double(scode),R,P);
nnumb = mod(round(inv(m))*(ncode-32),95)+32;
sorig = reshape(char(nnumb),1,(R*P));
disp(sorig);
decrypt = sorig(1:end-q);
disp(decrypt);
sdecrypt=decrypt;
%%%% Code ends %%%%
```

```
>> s

s =

    'Have you seen Sparky today? Yes, at the Sun Devil Stadium.'

>> m=[1 1
2 1]

m =

     1     1
     2     1

>> [sencrypt,sdecrypt]=q1_ASUID(s,m)
    58

    29

     0

Have you seen Sparky today? Yes, at the Sun Devil Stadium.
  Columns 1 through 20

    72   118    32   111    32   101   110    83    97   107    32   111    97    63 ↙
89   115    32   116   116   101
    97   101   121   117   115   101    32   112   114   121   116   100   121    32 ↙
101    44    97    32   104    32

  Columns 21 through 29

    83   110    68   118   108    83    97   105   109
   117    32   101   105    32   116   100   117    46

*R\SyyeUssK1n]DwT6eQttTD[=?^?x saati]ReKI|n]*N`WlYH{F(_I{i
*R\SyyeUssK1n]DwT6eQttTD[=?^?x saati]ReKI|n]*N`WlYH{F(_I{i
Have you seen Sparky today? Yes, at the Sun Devil Stadium.
Have you seen Sparky today? Yes, at the Sun Devil Stadium.

sencrypt =

    '*R\SyyeUssK1n]DwT6eQttTD[=?^?x saati]ReKI|n]*N`WlYH{F(_I{i'


sdecrypt =

    'Have you seen Sparky today? Yes, at the Sun Devil Stadium.'

>>
```

```
>> s

s =

    'Have you seen Sparky today? Yes, at the Sun Devil Stadium.'

>> m

m =

     1     2     3
    -1    -1    -3
     9    16    28

>> [sencrypt,sdecrypt]=q1_ASUID(s,m)
    58

    20

     2

Have you seen Sparky today? Yes, at the Sun Devil Stadium.**
     72   101   111   115   110   112   107   116    97    32   115    97   116    32 ↙
   110   101   108   116   105    46
     97    32   117   101    32    97   121   111   121    89    44   116   104    83 ↙
    32   118    32    97   117    42
    118   121    32   101    83   114    32   100    63   101    32    32   101   117 ↙
    68   105    83   100   109    42

P1(SLi[:lP5nIVHltb_:)b-=SF;D5y, tKI=W1Hhj]{$ p&SGX6F;z~vx`I{
P1(SLi[:lP5nIVHltb_:)b-=SF;D5y, tKI=W1Hhj]{$ p&SGX6F;z~vx`
Have you seen Sparky today? Yes, at the Sun Devil Stadium.**
Have you seen Sparky today? Yes, at the Sun Devil Stadium.

sencrypt =

    'P1(SLi[:lP5nIVHltb_:)b-=SF;D5y, tKI=W1Hhj]{$ p&SGX6F;z~vx`'


sdecrypt =

    'Have you seen Sparky today? Yes, at the Sun Devil Stadium.'

>>
```

```
>> s

s =

    'Have you seen Sparky today? Yes, at the Sun Devil Stadium.'

>> m

m =

     1    -1     3    -2
     2    -1     0    -1
     7    -5    10    -6
     1     0    -2     4

>> [sencrypt,sdecrypt]=q1_ASUID(s,m)
    58

    15

     2

Have you seen Sparky today? Yes, at the Sun Devil Stadium.**
    72    32    32   110    97    32    97    89    32   116    83    68   108    97 ↙
109
    97   121   115    32   114   116   121   101    97   104   117   101    32   100 ↙
46
   118   111   101    83   107   111    63   115   116   101   110   118    83   105 ↙
42
   101   117   101   112   121   100    32    44    32    32    32   105   116   117 ↙
42

 I5Qi09wqFSKgl&+>Vgq1FY3eIC#7ATB|>H6=!_I*1Ouo9L]]d_9NhReiCB"
 I5Qi09wqFSKgl&+>Vgq1FY3eIC#7ATB|>H6=!_I*1Ouo9L]]d_9NhReiC
Have you seen Sparky today? Yes, at the Sun Devil Stadium.**
Have you seen Sparky today? Yes, at the Sun Devil Stadium.

sencrypt =

    ' I5Qi09wqFSKgl&+>Vgq1FY3eIC#7ATB|>H6=!_I*1Ouo9L]]d_9NhReiC'


sdecrypt =

    'Have you seen Sparky today? Yes, at the Sun Devil Stadium.'

>>
```

```matlab
function [L,U] =q2_1226347696(A)
%%%% Code starts %%%%
flag =0;
%assign rows and columns
[row,column]=size(A);
%assign one empty matrix
Q= zeros (row,row);
for c = 1:column-1
    %add if statement such that row exchange is invalid
    if flag == 0
        for r = c:row-1
            if A(c,c)==0
                fprintf('row exchange needed');
                flag = flag+1;
            break;
            %now we know that lower and upper triangular matrix will have
            %zeroes in their respective area so substitute and do
            %elimination
            else
            k = A(r+1,c)/A(c,c);
            A(r+1,:) = A(r+1,:) - k*A(c,:);
            Q(r+1,c)=k;
            end
        end
    end
end
%incase the matrix requires row exchange give output as zero
if flag ==1
    fprintf(' Program will not run unless rows are exchanged');
else
    %now store the values that we get by elimination in respective place

U = A;
L = Q;
for i=1:row
 L(i,i)=1;

end
end
%%%% Code ends %%%%
```

```
>> A

A =

     1    -1     3     5     6     7
     2     5     7     0     3     4
    -3     4     0    -1    -1     0
    -6     0   -10    -6   -10    11

>> [L,U] =q2_1226347696(A)

L =

    1.0000         0         0         0
    2.0000    1.0000         0         0
   -3.0000    0.1429    1.0000         0
   -6.0000   -0.8571    1.0000    1.0000


U =

  Columns 1 through 5

    1.0000   -1.0000    3.0000    5.0000    6.0000
         0    7.0000    1.0000  -10.0000   -9.0000
         0         0    8.8571   15.4286   18.2857
         0         0         0         0         0

  Column 6

    7.0000
  -10.0000
   22.4286
   22.0000

>> L*U

ans =

  Columns 1 through 5

    1.0000   -1.0000    3.0000    5.0000    6.0000
    2.0000    5.0000    7.0000         0    3.0000
   -3.0000    4.0000         0   -1.0000   -1.0000
   -6.0000         0  -10.0000   -6.0000  -10.0000

  Column 6

    7.0000
```

```
    4.0000
         0
   11.0000

>>
```

```
>> A=[2 0 2 -1; 4 -2 -3 6; 3 -5 6 3; 0 2 7 -8; 17 -11 -1 20; 1 7 5 -13]

A =

     2     0     2    -1
     4    -2    -3     6
     3    -5     6     3
     0     2     7    -8
    17   -11    -1    20
     1     7     5   -13

>> [L,U] =q2_1226347696(A)

L =

  Columns 1 through 5

    1.0000         0         0         0         0
    2.0000    1.0000         0         0         0
    1.5000    2.5000    1.0000         0         0
         0   -1.0000         0    1.0000         0
    8.5000    5.5000    1.0000         0    1.0000
    0.5000   -3.5000   -1.0000         0         0

  Column 6

         0
         0
         0
         0
         0
    1.0000


U =

    2.0000         0    2.0000   -1.0000
         0   -2.0000   -7.0000    8.0000
         0         0   20.5000  -15.5000
         0         0         0         0
         0         0         0         0
         0         0         0         0

>> L*U

ans =

     2     0     2    -1
     4    -2    -3     6
```

```
     3     -5      6      3
     0      2      7     -8
    17    -11     -1     20
     1      7      5    -13


>>
```