Çankaya University
Department of Computer Engineering

CENG 290 - Data Communications

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LABWORK 5

Write MATLAB functions with the following descriptions:

MySwap: Given a vector $x = [x_1, x_2, x_3, x_4, \ldots]$ swap the elements to obtain $y = [x_2, x_1, x_4, x_3, \ldots]$. If the number of components is odd, the last one is not changed.

Billiard: Generate a matrix of zeros of given size. Then, starting with the given row and first column, insert 1 in a diagonal pattern until the bottom row. Then go up until the top row etc.

MySwap

```
function y = MySwap( x )

%Written by Emre Sermutlu on 10.04.2015
%This function swaps the consecutive elements of a vector as follows:
%[x1 x2 x3 x4] -> [x2 x1 x4 x3]

n = size(x,2);
y = zeros(1,n);

for i = 1:n-1
    if mod(i,2) == 1
        y(i) = x(i+1);
    else
        y(i) = x(i-1);
    end
end

if mod(n,2) == 0
    y(n) = x(n-1);
else
    y(n) = x(n);
end
end
```

Billiard

```
function A = Billiard(n,m,k)

%Written by Emre Sermutlu on 10.04.2015
%This function generates a zero matrix of size (n,m)
%And then puts 1 to position (k,1). Then, starting with
%this element, going down and right in a diagonal,
%and reflecting back up and right, all those elements
%are transformed to 1, as if it is a billiard ball bouncing.

A = zeros(n,m);
i = k;
del = 1;

for j = 1:m
    A(i,j) = 1;
    if i == n
        del = -1;
    elseif i == 1
        del = 1;
    end
    i = i + del;
end
end
```