MATLAB EXERCISE 1.37 **Preprocessing of geometrical data for the MoM matrix.**
Write a function `localCoordinates()` in MATLAB that – for the input `n,m,a,b` – subdivides a rectangular surface of sides a and b into $n \times m$ patches and returns arrays of local coordinates of centers of patches, p and q, as well as of surface areas of patches, ΔS. The patches should be numerated from $(1,1)$ in one corner of the rectangle to (n,m) in the diagonally opposite corner. This function can then be used to prepare the geometrical data (so-called preprocessing) for computing the elements of the associated MoM matrix $[A]$. *(localCoordinates.m on IR)*

SOLUTION:

```
%
%   Book: MATLAB-Based Electromagnetics (Pearson Prentice Hall)
%   Author: Branislav M. Notaros
%   Instructor Resources
%   (c) 2011
%
%   This MATLAB code or any part of it may be used only for
%   educational purposes associated with the book
%
%
%


%   Preprocessing of geometrical data for the MoM matrix


function [p,q,S] = localCoordinates(n,m,a,b)
dp = a/n;
dq = b/m;
for i=1:n
    for j=1:m
        p(m*(i-1)+ j) = (i-1/2)*dp;
        q(m*(i-1)+ j) = (j-1/2)*dq;
        S(m*(i-1)+ j) = dp*dq;
    end;
end;
```