Solutions to Homework 4

Help Center

Problem quadrants:

```
function Q = quadrants(n)

    a = ones(n);
    Q = [a 2*a ; 3*a 4*a];
end
```

Problem checkerboard:

```
function b = checkerboard(n,m)

    b = ones(n,m);
    b(1:2:n,2:2:m) = 0;
    b(2:2:n,1:2:m) = 0;
end
```

Problem randomness:

```
function r = randomness(limit,n,m)

    r = fix(limit * rand(n,m)) + 1;
end
```

Problem mtable:

```
function [t s] = mtable(n,m)

    t = (1:n)' * (1:m);
    s = sum(t(:));
end
```

If we matrix multiply a column vector of length N by a row vector of length M, each element of the resulting N-by-M matrix will be the product of one element from each vector. Therefore, we can create a multiplication table by setting the column vector to 1:N and the row vector to 1:M and using matrix multiplication.

Problem identity:

```
function I = identity(n)

    I = zeros(n);
    I(1 : n+1 : n^2) = 1;
end
```

Here we index into a matrix with a single index and MATLAB handles it as if it was a vector using column-major order. Putting ones at the first position and jumping n+1 every time, will put them exactly in the diagonal.

Created Thu 14 May 2015 2:30 PM PDT

Last Modified Tue 19 May 2015 6:00 AM PDT