

Review questions for the final exam

1. A Pascal's triangle with levels 0 to 4 is shown below. Level 0 has a single value, and each value on subsequent levels is the sum of the two entries diagonally above in the previous level of the triangle. For example, the value 6 in level 4 is the sum of the values 3 and 3 in level 3.

```
      1      level 0
     1 1     level 1
    1 2 1    level 2
   1 3 3 1   level 3
  1 4 6 4 1  level 4
      ⋮
```

Complete function `pascalVector` below to return the *row vector* corresponding to a specified level of Pascal's triangle. For example, if level `lev` is 4, then the returned vector must be `[1,4,6,4,1]`. Assume that `lev` is a non-negative integer. The only MATLAB built-in functions allowed are `zeros`, `ones`, and `length`.

Do not use the formula for binomial coefficients to solve this problem. Use a loop (or loops): the vector for each level is based on the vector from the previous level.

```
function p = pascalVector(lev)
% p is the vector corresponding to level lev of Pascal's triangle
```

2. `C` is a cell array with three components: a real number, a vector of numbers, and a matrix of numbers. Write a fragment to copy all the values in cell array `C` to a column vector `v`. For the values in the matrix, copy the values to the vector row-wise. *Do not use vectorized code* (recall that concatenation is vectorized code and therefore cannot be used in this question).

3. Given integers `nBig` and `nSm` where `nBig > nSm`, write a fragment that lists the integers in decreasing order and annotates the integers that are prime numbers. Assume `nBig, nSm > 1`. *Do not use built-in function isPrime and do not define your own function*. Example output for `nBig=6` and `nSm=3` is

```
6
5 is prime
4
3 is prime
```

4. Complete the following function.

```
function MyHistogram(v)
% Draw a histogram for the data in v using asterisks in the COMMAND WINDOW (not figure window).
% v is a vector of non-negative values.
% The histogram is scaled so that the largest data value is represented by
% ten asterisks. Round as necessary in order to draw whole asterisks.
% Example: v = [12 4.1 0.5 9.2 20]
% Output in Command Window:
% *****
% **
%
% *****
% *****
```

5. Review the project questions, lecture examples, section exercises, and prelim review questions!