

CS1112 Discussion Exercise 11

1 Structure and structure array

Implement the following function for creating a *structure* for square data:

```
function Sqr= MakeSquare(x, y, L)
% Sqr is a square with
%   Sqr.x (x-coordinate of lower left corner) assigned x
%   Sqr.y (y-coordinate of lower left corner) assigned y
%   Sqr.length assigned L
```

Write a code fragment to create a *structure array* of length 5 where each component in the array is a structure containing square data. Make effective use of your function `MakeSquare`. Let all the x- and y-coordinates be random in (0,9) and let the k^{th} square have length k .

2 Cell array of cards

Implement the following function:

```
function sd = Cut3(d)
% d is a one-dimensional cell array whose length is a multiple of 4.
% sd is the cell array after cutting the deck (d) by taking half the cards from
%   the middle of the deck and putting that half on top.
```

If you haven't completed `MyShuffle` from last week, be sure to do it now:

```
function sd= MyShuffle(d)
% d is a one-dimensional cell array
% sd is the cell array after shuffling d
% The shuffle comprises two steps:
% - randomly cut the deck into 2 parts. I.e., the position of the cut is random.
% - interleave the cards from the two parts until the part with fewer
%   cards have been completely incorporated. It is up to you whether
%   to start from the top or the bottom.
```

3 Designing Classes

Complete this problem *after the next lecture*. You will submit your answers to this problem *on paper* (typed or hand written) *at the beginning* of next week's discussion section.

This problem is about generating *ideas*, not writing code. For each design problem below, focus on what *data* (properties) are required and what *actions* may be performed on that data. (*Later* we will work on turning ideas into code—for this problem do not write any code.)

3.1 Design a *Fraction* class

- What makes up a *Fraction*? (There are at least two properties.)
- What actions can you perform on a *Fraction* or multiple *Fractions*? (Give at least four actions.)

3.2 Design a *Facebook Profile* class

- What does a *Facebook Profile* contain? (Give at least four example properties and specify their type.)
- What actions can you perform on or perform using one or more *Facebook Profiles*? (Give at least eight example actions.)