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classdef Die < handle
% A fair die has a certain number of sides
% (default is 6). Any side may be top face.

    properties (Access=private)
        sides=6;
        top
    end

    methods
        function D = Die(s)
% Constructor: Create an s-sided Die
            if nargin==1
                D.sides= s;
            end
            D.roll()
        end

        function s = getSides(self)
            s= self.sides;
        end

        function t = getTop(self)
            t= self.top;
        end

        function roll(self)
% Roll the Die once
            face= ceil(rand*self.getSides());
            self.setTop(face)
        end

        function disp(self)
            if length(self)==1
                fprintf('die showing face %d\n',...
                    self.getTop())
            else
                disp@handle(self)
            end
        end
    end %methods public

    methods (Access=protected)
        function setTop(self, f)
% Set this Die's top to face f
            self.top= f;
        end
    end %methods protected

end %classdef

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classdef TrickDie < Die
% An unfair die with one face (favoredFace) a
% certain number of times (weight) more likely
% than another face to be on top.

    properties (Access=private)
        favoredFace % face more likely to be
                    % on top
        weight= 1; % favoredFace is WEIGHT
                    % times more likely to
                    % be on top
    end

    methods
        function TD = TrickDie(ff, w, s)
% Constructor: Favored face ff is w
% times more likely than another face
% of this TrickDie to be on top.
            if nargin<3
                s= 6;
            end
            TD= TD@Die(s);
            if nargin>=2
                TD.favoredFace= ff;
                TD.weight= w;
            end
            TD.roll()
        end

        function w = getWeight(self)
            w= self.weight;
        end

        function ff = getFavoredFace(self)
            ff= self.favoredFace;
        end

        function roll(self)
            face= ceil(rand*(self.getSides()+...
                self.getWeight()-1));
            if face>self.getSides()
                face= self.getFavoredFace();
            end
            self.setTop(face)
        end

        function disp(self)
            fprintf('tricky ')
            disp@Die(self)
        end
    end %methods

end %classdef

```