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% Lab Section #202
% Project 2: Chaos Game, Spring 2019

%%
function [nextPoint] = unrestrictedChaos(prevPoint, vertices, cutFraction)
% implements the unrestricted chaos game, where any vertex can be chosen at
% random. One of the vertices of the polygon is chosen at random, and the
% next point is calculated to be the cutting fraction away from the
% previous point.

%Input: prevPoint - 2 by 1 vector of real numbers that shows the (x,y)
%          coordinates of the previously chosen point.
%          vertices - number of vertices by 2 array, where each row is the coordinates
%          of a specific vertex.
%          For example, a square will be 4 by 2
%          cutFraction - a real number that is the calculated cutting fraction
%          for a specific polygon.
%          For example, a square would be 0.5.
%Return: nextPoint - 2 by 1 vector of the next point

% Getting the random number
randomNumber = randi([1,length(vertices)]);

% Making a vertex out of the random number
randomVertex = vertices(randomNumber, :);

% Finding the next point
nextPoint = (prevPoint + randomVertex).*cutFraction;

end
```