

```

function parentIndex = GreenModSelection(expectation)
%   GENERATES INDEX OF PARENTS SELECTED AND PAIRED FOR BREEDING WITH THE
%   ARRAY'S ROWS THAT WAS EVALUATED BY THE FITNESS FUNCTION THAT RESULTED
%   IN THE EXPECTATION INPUT
%
%   [MxN DOUBLE] = GreenModSelection([Mx1 DOUBLE])
%
%   INPUTS:
%       expectation : SCALED RESULT FROM GreenModFitScalingRank.m FUNCTION
%
%   OUTPUTS:
%       parentIndex : INDEX OF SELECTED CHROMOSOMES FOR BREEDING. THE
%                   ORIGINAL ROWS ARE INDEXED WITH THIS OUTPUT TO
%                   GENERATE A NEW ARRAY OF CHROMOSOMES TO BE PAIRED
%                   WITH THE ORIGINAL ROWS OF CHROMOSOMES.
%                   IE. IF THE RESULT OF arr(parents) GIVES A VECTOR C
%                   IN ROW 1 IT SHOULD BE BRED WITH VECTOR A IN ROW 1
%                   OF THE ORIGINAL ARRAY PASSED INTO THE FITNESS
%                   FUNCTION F(X) OR f(X)
%
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%   PROJECT: ME 6101 GREEN MODULAR DESIGN GROUP PROJECT
%   DATE: NOVEMBER 2017
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%
%   NOTE: THIS FUNCTION IS BASED ON MATLAB'S selectionstocunif.m FUNCTION

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

assert(length(expectation)>1,['AN ERROR OCCURED: FITNESS/POPULATION',...
    'SIZE IS TOO SMALL']);
nParents = length(expectation);
wheel = cumsum(expectation)/nParents;
parentIndex = zeros(1,nParents);

% STEPSIZE
stepSize = 1/nParents;

% POSITION SELECTION
position = rand * stepSize;

lowest = 1;

% ASSIGNS A PARENT TO EACH POSITION OF THE ROULETTE WHEEL
for i = 1:nParents
    for j = lowest:length(wheel)
        if(position < wheel(j))
            parentIndex(i) = j;
            lowest = j;
            break;
        end
    end
    position = position + stepSize; % ITERATE TO NEXT STEP
end

```

```
parentIndex=parentIndex';  
end
```

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