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%%Project-1:: Question - 4
%%To Simulate a fair coin toss and count the number of tosses until
%%reaching a user specified positive number of heads

%%The below function runs a while loop until the number of heads observed
%%is equal to the user defined number.
%%Inside the while loop, we have
%%1) Rand function(Uniformly distributed random numbers) to generate a
    %%random number between (0,1)
%%2) NumFlips and head_count to keep track of the number of coin flips and
    %%heads.
%%3) If a Tail(1) occurs, reset the head_count. Otherwise run while loop
    %%until the head_count Not Equal to user_num_heads
%%4) A Summary showing total number of flips for user defined consecutive heads
%%-----
function [ ] = coin_toss(user_num_heads)
    %initialize
    head_count = 0;
    NumFlips = 0;
    array_of_total_flips = zeros(1, 'uint8');

    while user_num_heads ~= head_count
        % generate a number U[0,1] and threshold to fair Bernoulli trial
        IsHead = (rand > 0.5);
        NumFlips = NumFlips +1;%Incrementing the Number of Flips
        %contains the result of every flip until user defined positive number of heads
        array_of_total_flips(NumFlips) = IsHead;
        %Reset counter if coin flip results in tails
        if IsHead == 1
            head_count = 0;
        else
            head_count = head_count+1;
        end
    end
    disp('Result of all coin toss until reaching the user defined number of heads');
    disp(array_of_total_flips);
    Summary=['Total flips to reach user defined heads(',num2str(head_count),') in a
row'];
    disp(Summary);
    disp(NumFlips);
```