**Project 1 Data**

**Ex1.**

|  |
| --- |
| 0.52 |
| 0.45 |
| 0.48 |
| 0.46 |
| 0.51 |
| 0.52 |
| 0.53 |
| 0.46 |
| 0.41 |
| 0.53 |

Ex2.

0.41 was lowest

Ex3.

trials = 1000;

|  |
| --- |
| 0.5179 |
| 0.5240 |
| 0.5169 |
| 0.5000 |
| 0.4900 |
| 0.5150 |
| 0.4850 |
| 0.4910 |
| 0.5150 |
| 0.5040 |

Trials = 100000;

|  |
| --- |
| 5003 |
| 5011 |
| 4987 |
| 4971 |
| 5021 |
| 5017 |
| 5020 |
| 5004 |
| 5005 |
| 4999 |

Ex4.

*Part 1 N = 10,000* = 5.94% *Part 2 N = 100,000* = 6.25%

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| --- |
| %%  % Project 1 #4  %Jacob Howard  %Expected Probability of all 4 coins being heads is 6.25%    %%  %#4 Part 1  % Setting n to 10,000  n = 10000;  allHeads = 0; % Setting number of times all heads appears to 0    % loop N times to count every time all heads appear in 4 coin flips  for i =1:n  coinFlip = randi([0,1],1,4); % randomly generates 4 coin flips (0 being tains and 1 being heads)  if(sum(coinFlip) == 4) % if all heads, allHeads variable incremented by 1  allHeads = allHeads + 1;  end  end    % Set up a message that calculates and displays the percentage of all 4  %coin tosses being heads  fprintf('Percentage of all 4 Heads for: Part 1 / n = %d is %.2f\n',n,((allHeads\*100)/n));    %%  %#4 Part 2  % Setting n to 100,000  n = 100000;  allHeads = 0; % set number of times all heads appears to 0    % loop N times to count every time all heads appear in 4 coin flips  for i =1:n  coinFlip = randi([0,1],1,4); % randomly generate 4 coin flips (0-tails, 1-heads)  if(sum(coinFlip) == 4) % if all heads, increment all\_heads by 1  allHeads = allHeads + 1;  end  end    % Set up a message that calculates and displays the percentage of all 4  %coin tosses being heads  fprintf('Percentafe of all 4 Heads for: Part 2 / n = %d is %.2f\n',n,((allHeads\*100)/n));  %% |

Ex 5.

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| %%  %Project 1 Part 5  %Jacob Howard  %%  %probability of heads  %expected probability of 0.45  trials=100;  p=0;  for i=1:1000    flip=rand(1,trials);  heads=(flip>=0.55);  if (sum(heads)/100)>=0.5  p=p+1;  end  end  percentheads = sum(heads)/trials;  p;  fprintf("Relative frequency of unfair coin landing Heads = %f\n",percentheads);  %%  %Relative frequency of showing as a fair coin  pFair=(p/1000);  p=100\*(p/1000);  fprintf("Relative frequency of fair coin showing fair coin RF = %f\n",pFair);  %% |