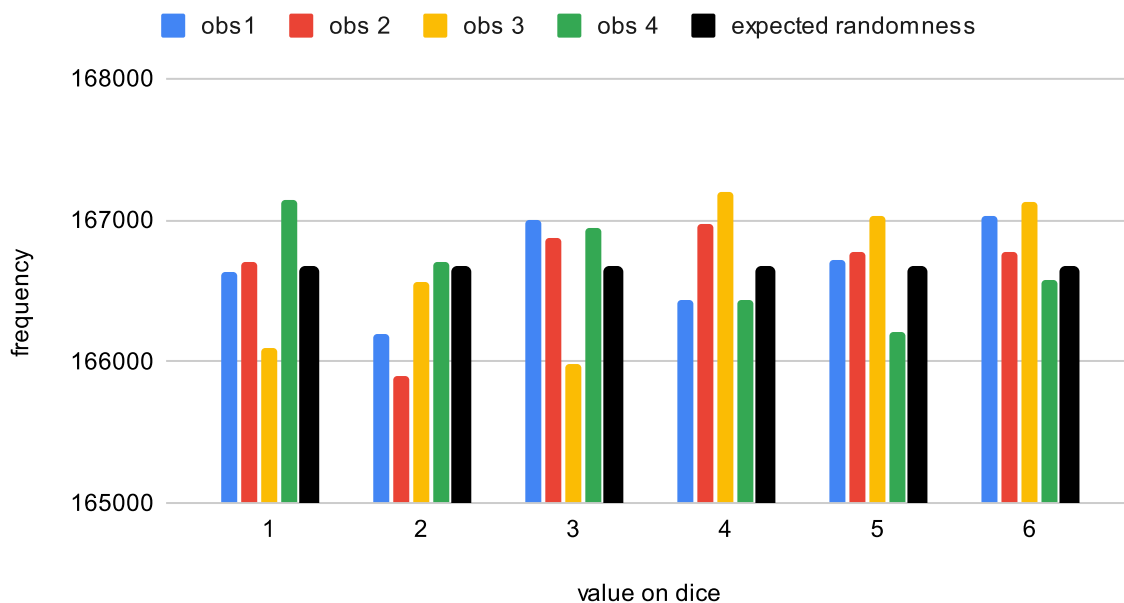


Report S1

1) the following randomness is observed using the C programme for randomising the throw of a single die:

randomness in throwing single die



The black bars represents the expected randomness for an unbiased dice and the other colors depict different observations of the output of programme. The produced outputs are randomly distributed, so the series is random enough.

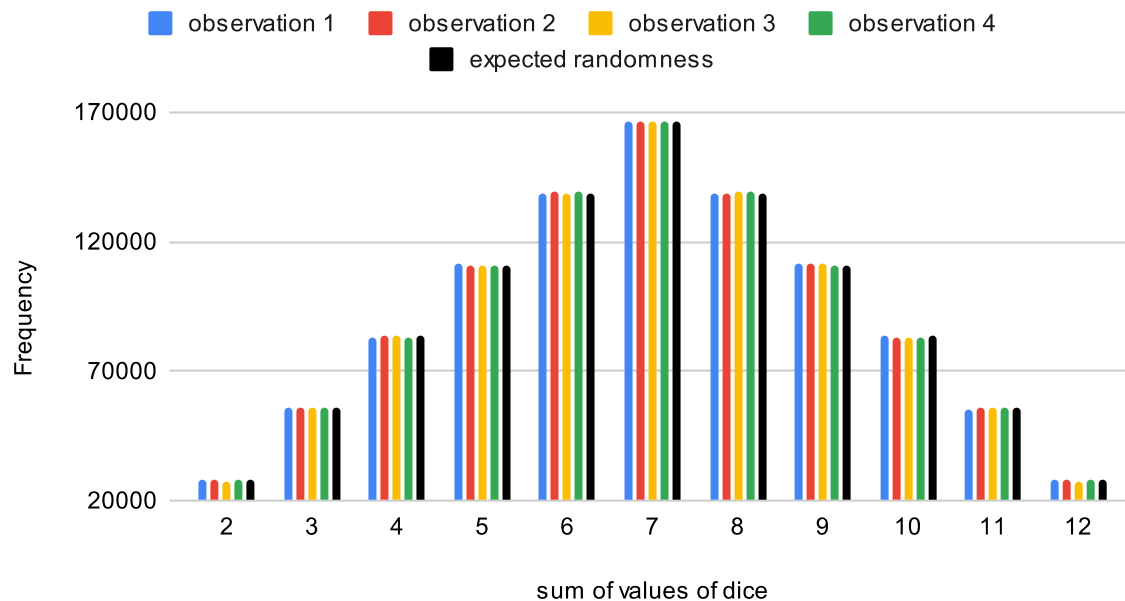
(Note: the frequency on y axis is scaled between 165000 and 168000 and not 0—17000)

Gsheet link -

https://docs.google.com/spreadsheets/d/1XvraENzmcarSavYL6aP37F6Ulf1NrgK_hK52wdTXgpA/edit?usp=sharing

2)the following graph was plotted (sum on 2 dice vs the frequency).The black bars represents the expected randomness for an unbiased dice and the other colors depict different observations of the output of programme.

Randomness in sum of value on 2 dice



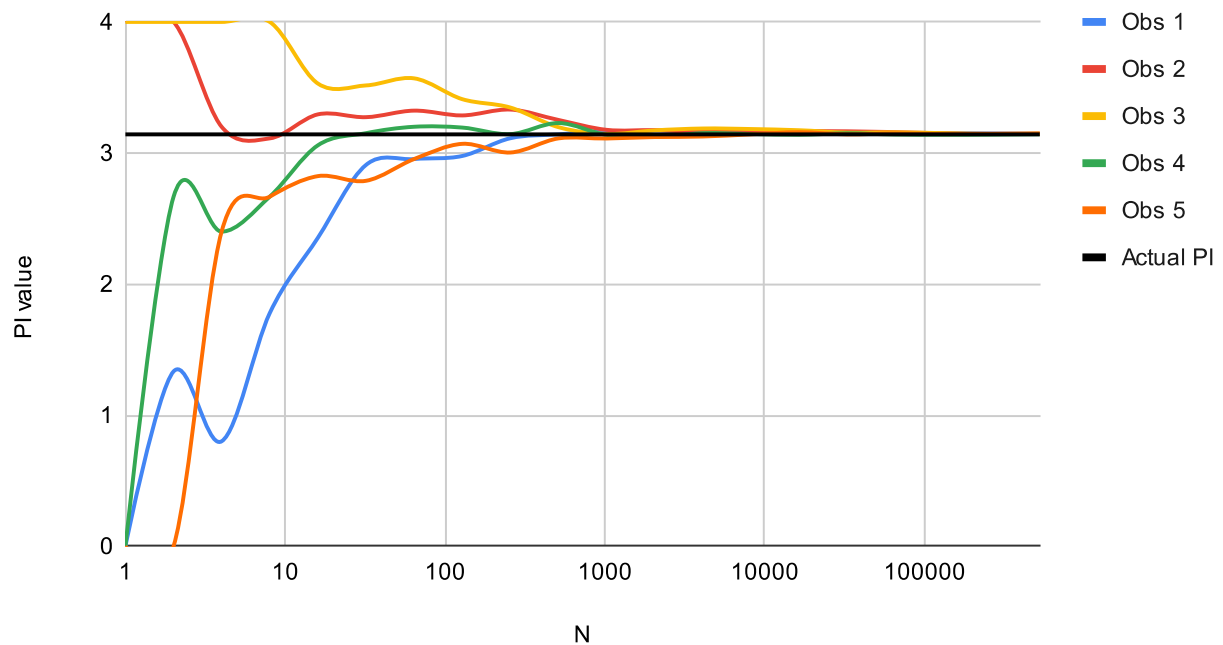
The programme outputs are almost same as the theoritical distribution of the sum when 2 unbiased dice are thrown at random.

Gsheet link -

<https://docs.google.com/spreadsheets/d/1EqIAPxwnQ6G-IIFE3xVK9XNioZbPtlig3wpNEZ1wFqA/edit?usp=sharing>

3) the value of PI is estimated, and plotted against N in a logarithmic scale for more clarity :

Estimation of PI



black line depicts the actual value of PI , and other colours depicts the value of PI change over the range of N for different observations.

Gsheet link -

<https://docs.google.com/spreadsheets/d/1kAOBcVGsQBiC6kaLh4jlKxZdGdrrSxS1NKxhH1bc6vI/edit?usp=sharing>