Answer on Question #84362 – Math – Statistics and Probability

Question

A fair coin is tossed five times. Find the possibilities that a head appears
i) exactly three times
ii) at least two times
iii) at the most four times.

Solution

i) Probability of success for Bernoulli random:
$f(3;5;0.5)=f(k,n,p)=(_n^k)p^k\ (1-p)^{n-k}=5!/(3!2!)\ 0.5^3 0.5^2=10\ 0.5^5=\underline{0.3125}$

ii) To calculate probability of the event "At least two times" we can use next property: probability of the universal set without event "less than 2" (this is events "0" and "1 time"):

$P= 1-(f(0;5;0.5)+ f(1;5;0.5))=1-(0.5^5+5!/(4!1!)\ 0.5^4 0.5)=1-0.5^5(1+5)=$
$=1-6\ 0.5^5=1-0.1875=\underline{0.8125}$

iii) We can use next property: probability of the universal set without event "5 times":
$P=1-f(5;5;0.5)=1-0.5^5=1-0.03125=\underline{0.96875}$

Answer: i) 0.3125; **ii)** 0.8125; **iii)** 0.96875.