R Notebook

#### Problem-10: sampling spaces and probability vector for the tabet problem part-1

s1 = c('A1', 'A2')   
p1 = (1/length(s1))\*replicate(length(s1), 1)  
s2 = c(paste0('A', c(3:10)), paste0('B', c(1:10)))  
p2 = (1/length(s2))\*replicate(length(s2), 1)

#### Function to simulate the picking one tablet from the 1st bottle and one from the rest of the pile

simTrialTablet = function(){  
return(c(sample(s1, 1, prob = p1), sample(s2, 1, prob = p2)))  
}

#### Function to check if the person will not overdose

checkEventTablet = function(data){  
return(sum(grepl('A', data)) == 1)  
}

#### Simulate the person picking one tablet from the 1st bottle and one from the rest of the pile and calculate the probability that they will not overdose

simulatedData = replicate(10000, simTrialTablet())  
mean(apply(simulatedData, 2, checkEventTablet))

## [1] 0.5565

#### Problem-12(a): sampling space and probability vector for rolling a single die

s = c(1:6)  
p = (1/length(s))\*replicate(length(s), 1)

#### Function to simulate the rolling of a single die 4 times

simTrialDie = function(){  
return(sample(s, 4, replace = T, prob = p))  
}

#### Function to check if any of the 4 rolls is a 6

checkEventDie = function(data){  
return(6 %in% data)  
}

#### Simulate several times “the rolling of a single die 4 times” and calculate the probability of getting atleast one 6

simulatedData = replicate(10000, simTrialDie())  
mean(apply(simulatedData, 2, checkEventDie))

## [1] 0.5188

#### Problem-12(b): sampling space and probability vector for rolling a pair of dice

s = c(1:6)  
p = (1/length(s))\*replicate(length(s), 1)

#### Function to simulate the rolling of a a pair of dice 24 times

simTrialDice = function(){  
return(replicate(24, paste0(sample(s, 1, prob = p), sample(s, 1, prob = p))))  
}

#### Function to check if any of the pair of rolls sum to 12

checkEventDice = function(data){  
return(any(lapply(lapply(strsplit(data, ""), as.numeric), sum) == 12))  
}

#### Simulate several times “the rolling of a pair of dice 24 times” and calculate the prbability of getting at east one 12

simulatedData = replicate(10000, simTrialDice())  
mean(apply(simulatedData, 2, checkEventDice))

## [1] 0.4863