

Take Home Exam 1

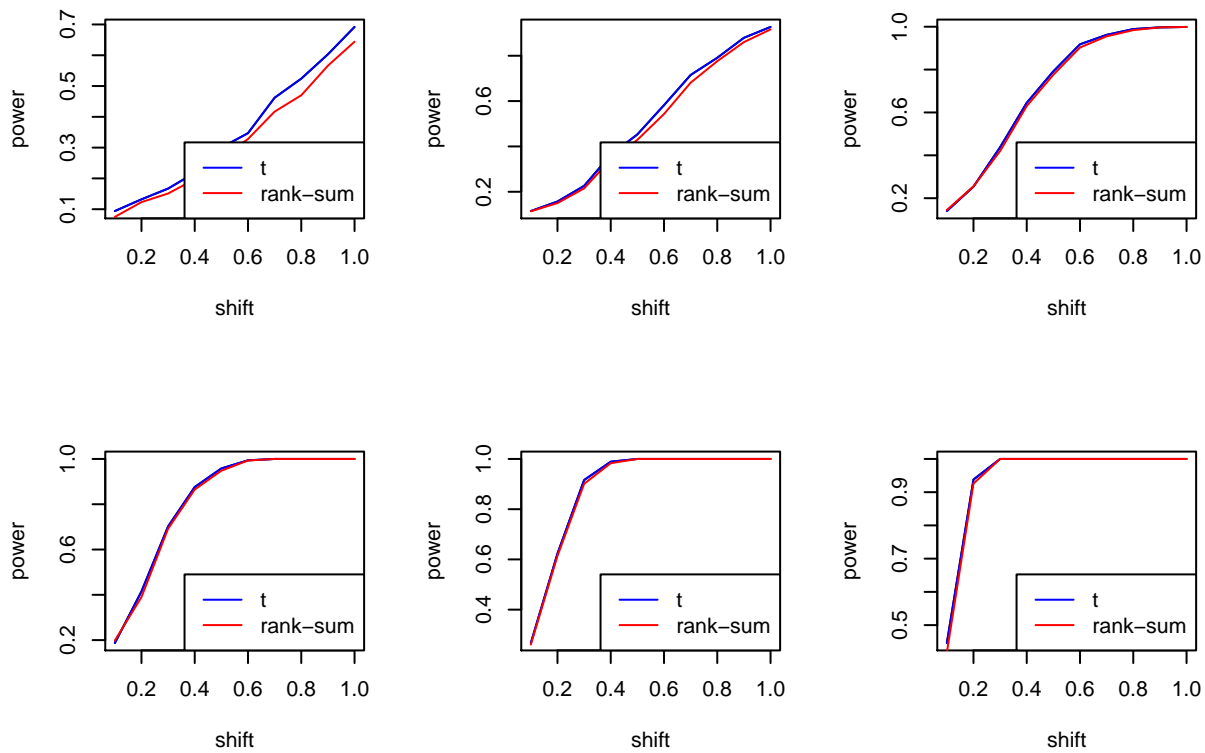
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Problem 1

```
size = c(10, 20, 50,100,200,500)
level = 0.1
generate_M = seq(0.1, 1, 0.1) #to make it 10
length_M = length(generate_M)
par(mfrow = c(2,3))
B = 1000
for (n in size) {
  reject_T = numeric(length_M)
  reject_W = numeric(length_M)
  for (mu in generate_M) {
    count.t =0
    count.w=0
    for (b in 1:B) {

      x = rnorm(n,mu,1)
      y = rnorm(n,0,1)
      pval_T = t.test(x, y, alternative = "two.sided", var.equal = TRUE)$p.value
      if (pval_T <= level) {
        count.t = count.t + 1
      }
      pval_W = wilcox.test(x, y, alternative = "two.sided")$p.value
      if (pval_W <= level) {
        count.w = count.w + 1
      }
    }
    reject_T[10*mu] = count.t/B
    reject_W[10*mu] = count.w/B
  }
}
plot(generate_M, reject_T, type = "l", xlab = "shift", ylab = "power")
lines(generate_M, reject_T,col = "blue")
lines(generate_M, reject_W ,col = "red")
legend('bottomright', c('t', 'rank-sum'), lty = 1, col = c('blue', 'red'), bg = "white")
}
```



Problem 2

===== Part 1 =====

```
tableObsExp = function(dat) {
  nrow = nrow(dat)
  ncol = ncol(dat)
}
```

===== Part 2 =====

```
name = c("Mustard Cabbage", "White Cabbage", "Chinese flowering cabbage", "Chinese cabbage", "Pak Choi")
col1 = c(9.07,9.53,12.25,2.27,4.99,1.81,4.08)
col2 = c(2.68,2.81,3.62,0.67,1.47,0.54,1.21)
col3 = c(3.51,3.68,4.73,0.88,1.93,0.70,1.58)
col4 = c(1.03,1.08,1.39,0.26,0.57,0.21,0.46)
col5 = c(0.21,0.22,0.28,0.05,0.11,0.04,0.09)
col6 = c(2.47,2.6,3.34,0.62,1.36,0.49,1.11)
col7 = c(0.21,0.22,0.28,0.05,0.11,0.04,0.09)
col8 = c(0.62,0.65,0.84,0.15,0.34,0.12,0.28)
col9 = c(0.21,0.22,0.28,0.05,0.11,0.04,0.09)
df = data.frame(name, col1,col2,col3,col4,col5,col6,col7,col8,col9)
nrow = nrow(df)
ncol = ncol(df)

for(i in 1:nrow){
  b = rowSums(df[nrow])
  b
```

}

===== Part 3 =====

===== Part 4 =====

*#H0:There is a relationship between the occurrence of different AGs and the host plants
#H1:There is no relationship between the occurrence of different AGs and the host plants
#we can look from the contingency table that there is some significant correlation between AGs
#and host plants. Therefore we can deduce that, we accept h0, there is a relationship between
#AGs and the host plants*