##HW2.NK\_reli.and.itemStats-cct.R##

# read - am tarix of 1000x22, id i1, i2, .., i21)

res.data<-data.matrix(read.table

 ("C:\\COURSES\\Rders\\hw\\data0157.dat",header=F,row.names=NULL))

# start with the output file

write("CTT RELI EST - HW1","C:\\COURSES\\Rders\\hw\\reli\_ctt.txt")

# the first column is id, leave it for now.

re.data<-res.data[,-1]

#define

#k<-21

k<-ncol(re.data)

#n<-1000

n<-nrow(re.data)

# create the matrix to be filled

out1<-matrix(c(rep(0,k\*6)),k,6)

# column 1

k\_id<-c(1:k)

out1[,1]<-k\_id

# cols 2 and 3

# COMPUTE - item

#ps

pcor<-colMeans(re.data)

out1[,2]<-round(pcor,2)

#p\*q

pvar<-pcor\*(1-pcor)

out1[,3]<-round(pvar,2)

# COMPUTE - test

test.mean<-mean(rowSums(re.data))

test.var<-var(rowSums(re.data))

reli.est<-k/(k-1)\*(1-((sum(out1[,3]))/var(rowSums(re.data))))

sem<-sqrt(test.var)-(sqrt(1-reli.est))

write("items N Mean Var Cronbach'sAlpha SEM",

 "C:\\COURSES\\Rders\\hw\\ctt\_reli\_mat.txt", append=T)

write(round(c(k, n, test.mean, test.var, reli.est, sem),3),

 "C:\\COURSES\\Rders\\hw\\ctt\_reli\_mat.txt", ncolumns = 6, append=T)

#install.packages("polycor")

library(polycor)

#j<-1

for(j in 1:k){

 out1[j,4]<-round(polychor(re.data[,j],rowSums(re.data)),3)

 #re est reli with the item out

 ree.data<-re.data[,-j]

 out1[j,5]<-round(polychor(re.data[,j],rowSums(ree.data)),3)

 #reli if item deleted

 #ps and pvars

 pcor<-colMeans(ree.data)

 pvar<-pcor\*(1-pcor)

 reli.if.del<-round(k/(k-1)\*(1-((sum(pvar))/(var(rowSums(ree.data))))),3)

 out1[j,6]<-reli.if.del

 #write.table(t(out1[j,]),

 # paste("C:\\COURSES\\Rders\\hw\\out1s\\ctt\_reli",j,sep=""),

 # sep=" ", append=T, col.names=F)

 j<-j+1

}

write("item İtemPCorrect itemVar pbis pbiscorrected Cronbach'sAlphaCorrected",

 "C:\\COURSES\\Rders\\hw\\ctt\_reli\_mat.txt", append=T)

write(t(round(out1,3)),

 "C:\\COURSES\\Rders\\hw\\ctt\_reli\_mat.txt", ncolumns = 6, append=T)

#### plots

jpeg("C:\\COURSES\\Rders\\hw\\cct.itempar.plot.jpg",

 width = 700, height = 300, quality = 75)

item.discrimination<-out1[,4]

item.difficulty<-out1[,2]

plot(item.discrimination,

 type = "p",

 pch = 1,

 cex = 4,

 col = "purple",

 ylab = "Item-Total Correlation/Item Difficulty",

 xlab = "Item Number",

 ylim = c(0, 1), xlim=c(1,21),

 main = "Test Item Discriminations")

#lines(item.difficulty, type="l",lty=3, lwd=2)

lines(item.difficulty, type="b",lty=3, lwd=2, pch=2)

abline(h = 0.5, col = "red")

abline(v = 10, col = "navy")

#legend(15,0.95, c("Dscr","Diff"),lty = c(1,3))

legend(18,0.95, legend = c("Dscr","Diff","0.5 line"), pch = c(1,2,0),

 col = c("blue", "black", "red"), lty = 1:2, cex = 0.8)

dev.off()