Data <- read.csv("Geo-Fence Analytics.csv")

for (i in 1:nrow(Data)){

if (Data$imp\_size[i] == 728\*90) {Data$imp\_large[i] <- 1

} else {Data$imp\_large[i] <- 0

}

}

for (i in 1:nrow(Data)){

if (Data$app\_topcat[i] == "IAB1" || Data$app\_topcat[i] == "IAB2" || Data$app\_topcat[i] == "IAB3" || Data$app\_topcat[i] == "IAB4" || Data$app\_topcat[i] == "IAB5" || Data$app\_topcat[i] == "IAB6" ) {Data$cat\_entertainment[i] <- 1

} else {Data$cat\_entertainment[i] <- 0

}

}

for (i in 1:nrow(Data)){

if (Data$app\_topcat[i] == "IAB14" ) {Data$cat\_social[i] <- 1

} else {Data$cat\_social[i] <- 0

}

}

for (i in 1:nrow(Data)){

if (Data$app\_topcat[i] == "IAB6" || Data$app\_topcat[i] == "IAB7" || Data$app\_topcat[i] == "IAB8" || Data$app\_topcat[i] == "IAB9" || Data$app\_topcat[i] == "IAB5" || Data$app\_topcat[i] == "IAB10" || Data$app\_topcat[i] == "IAB11"|| Data$app\_topcat[i] == "IAB12"|| Data$app\_topcat[i] == "IAB13"|| Data$app\_topcat[i] == "IAB14"|| Data$app\_topcat[i] == "IAB15"|| Data$app\_topcat[i] == "IAB16"|| Data$app\_topcat[i] == "IAB17"|| Data$app\_topcat[i] == "IAB18"|| Data$app\_topcat[i] == "IAB19" ) {Data$cat\_tech[i] <- 1

} else {Data$cat\_tech[i] <- 0

}

}

for (i in 1:nrow(Data)){

if (Data$device\_os[i] == "iOS") {Data$os\_ios[i] <- 1

} else {Data$os\_ios[i] <- 0

}

}

haversine <- function(lat1, lon1, lat2, lon2){

dlat <- (lat2 - lat1)\*pi/180

dlon <- (lon2 - lon1)\*pi/180

lat1 <- (lat1\*pi/180)

lat2 <- (lat2\*pi/180)

D = (sin(dlat/2)\*\*2 + (sin(dlon/2)\*\*2) \* (cos(lat1)) \* cos(lat2))

rad = 6371

c = 2 \* asin(sqrt(D))

return(rad \* c)

}

for (i in 1:nrow(Data)){

Data$distance[i] <- haversine(Data$device\_lat, Data$device\_lon, Data$geofence\_lat, Data$geofence\_lon)

}