Entrega Individual 3

Augusto Souto

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3

A

```
rm(list = ls())

#parametros#
r<-0.4
n<-10^6

#sorteo de valores en el hipercubo#
x<-runif(n, 0, 1) %>% as.matrix()
y<-runif(n, 0, 1) %>% as.matrix()

coor<-cbind(x, y)

#centro#
c_x<-rep(0.5,  n)
c_y<-rep(0.5,  n)
cent<-cbind(c_x, c_y)

valor<-vector("numeric", length=n)
#valores que toma la función en los puntos sorteados dentro de la region#
for (i in 1:n) {
  if(sum((coor[i,]-cent[i,])^2)<=r^2){
    valor[i]=(200*x[i]*y[i])/max(x[i],y[i])
  }else{
    valor[i]=0}
}

s<-vector("numeric", length=n)
t<-vector("numeric", length=n)

t[1]=0
s[1]=valor[1]

for (i in 2:n) {
    t[i]<-t[i-1]+(1-(1/i))*(valor[i] -( s[i-1] / (i-1)) )^2
    s[i]<-s[i-1]+valor[i]
}


int<-s[n]/n          #INTEGRAL ESTIMADA#
var_int<-t[n]/(n-1) #VARIANZA ESTIMADA#
var_est<-var_int/n #VARIANZA MUESTRA
```

```r
print(int)
```

```
## [1] 38.21435
```

```r
print(var_int)
```

```
## [1] 1961.17
```

```r
print(var_est)
```

```
## [1] 0.00196117
```

B

```r
####ESTIMACION DEL NUMERO DE CORRIDAS#####
z2<-qnorm(0.975)^2
epsilon<-sqrt(n/(z2*var_int))

n_es<-(z2*var_int)*10^2
print(n_es) ##NUMERO DE CORRIDAS ESTIMADA
```

```
## [1] 753375.3
```

C

```r
##intervalos de confianza
inf<-int-qnorm(0.975)*(var_int/n_es)^(1/2)
sup<-int+qnorm(0.975)*(var_int/n_es)^(1/2)

print(c(inf, sup))
```

```
## [1] 38.11435 38.31435
```