

tarea2

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Tarea 2

Elabora un documento de RMarkdown con tus respuestas. Envía y/o sube a una liga de github tu respuesta debes incluir al menos el archivo con extensión Rmd y opcionalmente el archivo html. Los comentarios a los problemas, códigos y sobre todo discusión de tus resultados deben ir como texto de RMarkdown

1. (15) Considera las siguientes cantidades discute y justifica qué tipo de distribución de probabilidad pueden tener las siguientes variables:

a. **El número (talla) de calzado de adultos varones en México.** *Gaussiana, ya que la mayoría de los adultos varones poseen un número de calzado que ronda al rededor del promedio, mientras que unos pocos tendrán una talla de calzado muy grande o muy pequeña.*

b. **La distribución de habitantes en asentamientos humanos de México.** *Distribución de cola larga, ya que hay pocas ciudades con muchos habitantes, mientras que la mayoría de las ciudades son medianas o pequeñas.*

c. La velocidad promedio de los automóviles en Bernardo Quintana a las 9 de la mañana en un día laborable.

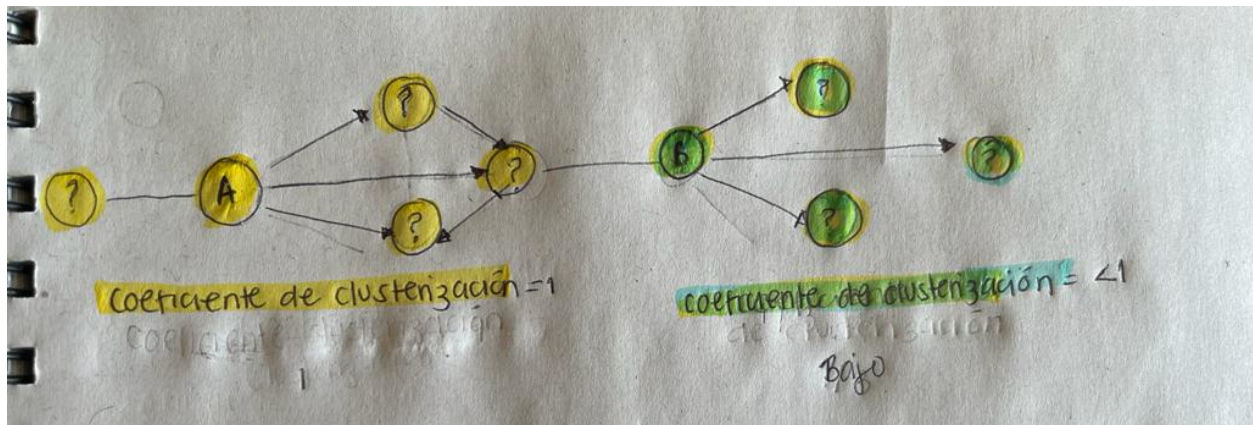
***Poisson**, ya que BQ, al ser una vialidad importante, cruza casi todo querétaro. Habrá segmentos de BQ en los que los haya embotellamientos, mientras que habrá otras automovilistas vayan más rápido debido a que ese segmento de la vialidad no está despejado. Además, considerando que la gente es desesperada, suele acelerar en los tramitos libres.*

d. La velocidad promedio de los automóviles en Bernardo Quintana a las 3 de la mañana.

Logarítmica, ya que es casi un hecho de que a las tres de la mañana BQ está libre. Podría pensar también en que la urgencia de llegar a tu casa en la madrugada es mucha porque pues... está pegrioso.

5 Supongamos que tenemos dos nodos (A,B) en una red. El nodo A y B tiene el mismo degree, pero el A tiene un coeficiente de clusterización de 1 y el nodo B un coeficiente bajo. Dibuja esta situación y explica cuál sería una mejor diana si quieres eliminarlos y afectar a la red.

La mejor diana sería el nodo B, ya que de esta manera estamos alterando toda la conectividad de la red, en otras palabras, si quitas a B, estás logrando que los nodos cercanos a este pierdan conectividad con el resto.



(olvidé marcar la línea que está en lapiz entre los signos de interrogación arriba y abajo del nodo a, pero se supone que así están conectados todos los nodos y por eso el coeficiente de clusterización es 1.

40 Elabora un programa en R que usando funciones calcule, a partir de una matriz de adyacencia (Sólo utiliza R base para resolver este problema)

- Si la red es dirigida o no.
- Si la red es pesada o no.
- El degree de los nodos.
- El histograma del degree.

```
#primero debo crear la matriz de adyacencia
lamasmatrix<-matrix(nrow=3, ncol=3)
#ahí se creó una matriz vacía, ahora la voy a llenar
lamasmatrix[1,1]<-0
lamasmatrix[1,2]<-2
lamasmatrix[1,3]<-3
lamasmatrix[2,1]<-2
lamasmatrix[2,2]<-0
lamasmatrix[2,3]<-2
lamasmatrix[3,1]<-3
lamasmatrix[3,2]<-2
lamasmatrix[3,3]<-0
lamasmatrix
```

```
##      [,1] [,2] [,3]
## [1,]    0    2    3
## [2,]    2    0    2
## [3,]    3    2    0
```

la red es dirigida o no? si una red es dirigida, M

ij

es distinto de M

ji

, mientras que si la red es dirigida, M

ij

es igual a M

j, i

. En esta función que acabo de crear, apartir de una matriz, siendo i los valores de las columnas y j el de las filas, se comparan las coordenadas en ij y ji, de ser iguales, se trata de una red no dirigida, de ser distintas, se trata de una red dirigida.

```
directedornot<-function(matriz){
  for(i in 1:ncol(matriz)){
    for( j in 1:nrow(matriz)){
      if ((matriz)[i,j] != (matriz)[j,i]){
        print ("red dirigida")} else{print("red no dirigida")}
      }
    }
  }
}

directedornot(lamasmatriz)
```

```
## [1] "red no dirigida"
## [1] "red no dirigida"
## [1] "red no dirigida"
## [1] "red no dirigida"
## [1] "red no dirigida"
## [1] "red no dirigida"
## [1] "red no dirigida"
## [1] "red no dirigida"
## [1] "red no dirigida"
```

#mi red es no dirigida

La matriz es pesada? Una matriz es pesada cuando la conexión tiene un valor distinto de uno.

En este caso, si ij o ji son mayores que 1, se trata de una red pesada.

En la estructura de mi función, establezco que para un objeto matriz, y con ayuda de un ciclo for, dependiendo de que el valor de M

i, j

y M

j, i

cumpla ciertas condiciones, arroje si la red es pesada o no. Esto para todos los valores de i y j (1:ncol, 1:nrow).

Las condiciones están establecidas con condicionales if, else if y else. Si la condición de que M

i, j

y M

j, i

sean mayores que 1, se imprimirá la frase “red pesada”; si son iguales a 1, se imprimirá la frase “Red no pesada”, y si son iguales a 0, se ignora por la carencia de conexión (en este caso la interacción del nodo consigo mismo)

```

pesado<-function(matriz){
  for(i in 1:ncol(matriz)){
    for(j in 1:nrow(matriz)){
      if ((matriz)[i,j]>1){print("Red pesada")} else if ((matriz)[j,i]>1){print("Red pesada")} else if (
    else{print("red no pesada")}
      }
    }
  }
}

pesado(lamasmatriz)

```

```

## [1] "-"
## [1] "Red pesada"
## [1] "Red pesada"
## [1] "Red pesada"
## [1] "-"
## [1] "Red pesada"
## [1] "Red pesada"
## [1] "Red pesada"
## [1] "-"

```

```

di<-function(matriz){for(i in nrow(matriz)){ return(di<-c(sum(matriz[,i])))
}}
di(lamasmatriz)

```

Degree de nodos

```
## [1] 5
```

```
#no sé qué hice mal:c
```

```

htgrm<-function(di){hist(di)}
htgrm<-lamasmatriz
#no me saleeee:c

```

histograma del degree

(40) A partir de la red de interacción de proteínas alojada en la librería *igraphdata*, que puedes llamar mediante `data(yeast)` elabora un programa en R (acá sí puedes usar librerías especializadas de R) que:

```

#llamar a la librería
library(igraphdata)

```

a. Calcule la distribución de conectividades y grafique esa distribución . Discute tu resultado.

```
## Warning: package 'igraphdata' was built under R version 4.1.2
```

```
library(igraph)
```

```
## Warning: package 'igraph' was built under R version 4.1.2
```

```
##
```

```
## Attaching package: 'igraph'
```

```
## The following objects are masked from 'package:stats':
```

```
##
```

```
##      decompose, spectrum
```

```
## The following object is masked from 'package:base':
```

```
##
```

```
##      union
```

```
data("yeast")
```

```
distlev<-degree(yeast, mode = "all")
```

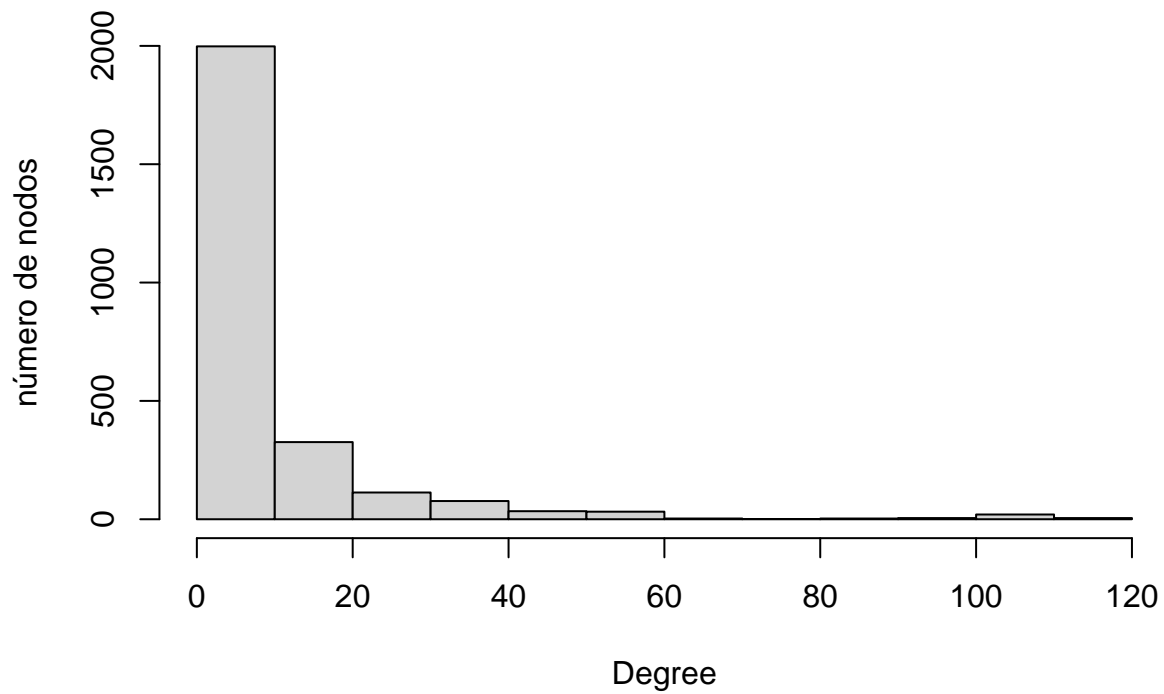
```
mean(distlev)
```

```
## [1] 9.059992
```

```
#En promedio, cada nodo tiene 9 conexiones.
```

```
hist(distlev, main = "frecuencia de conectividad en la red Yeast", xlab="Degree", ylab="número de nodos")
```

frecuencia de conectividad en la red Yeast



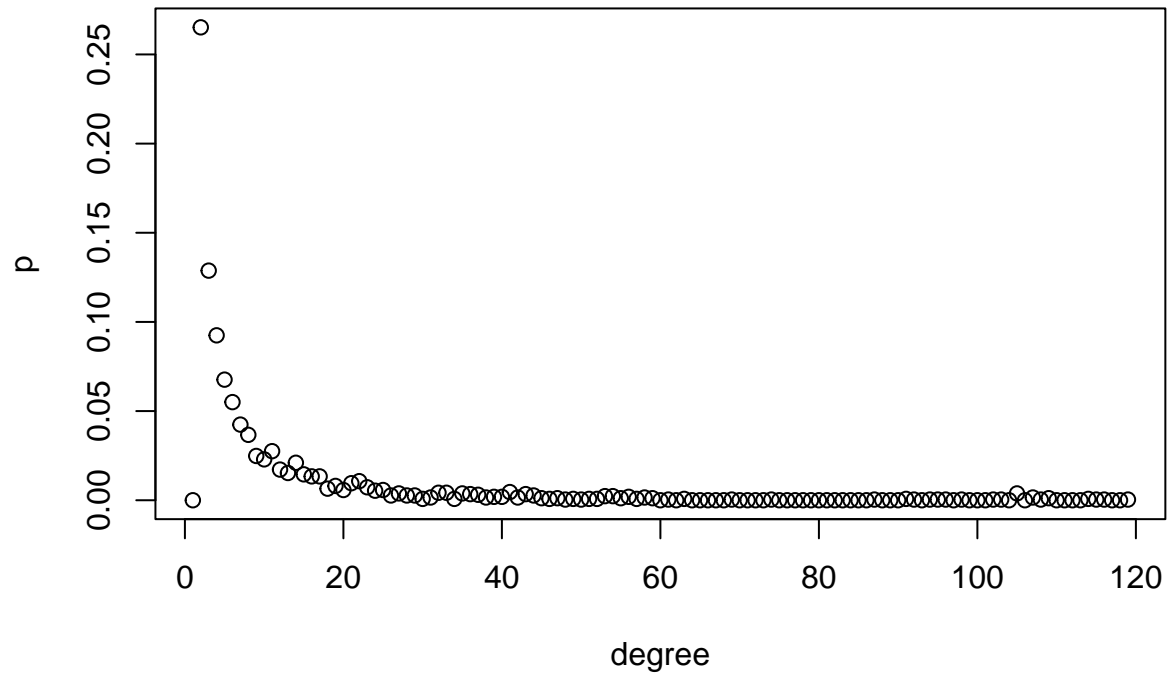
#se hace un histograma debido a que estamos hablando de frecuencias, y es más sencillo de entender en un gráfico
#La mayoría de los nodos (2000) tienen un degree de 10, y la frecuencia cae drásticamente pasando el valor de 10

Distribución de la conectividad#####

```
dcl<-degree.distribution(yeast)
```

```
plot(dcl, main= "distribución de la conectividad",ylab="p" ,xlab = "degree")
```

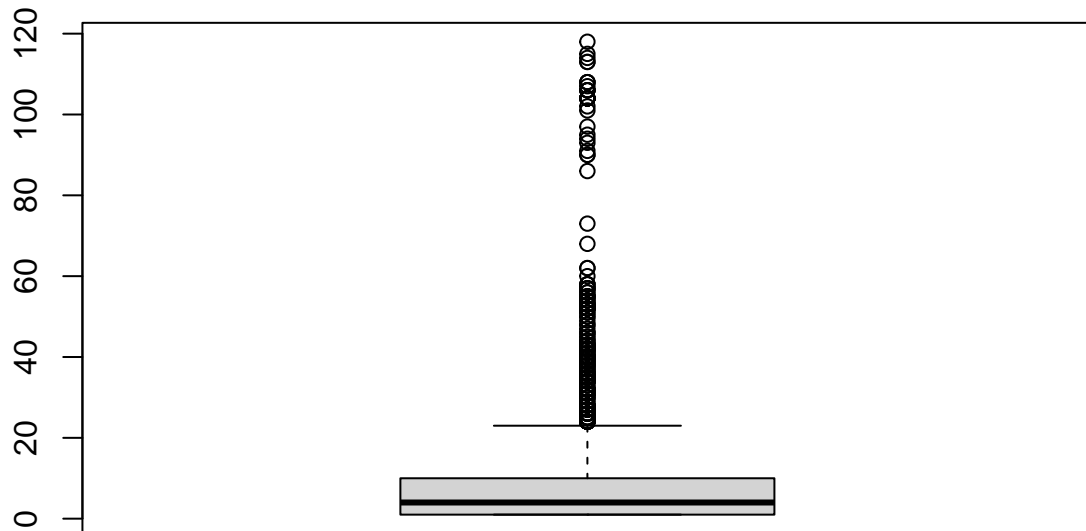
distribución de la conectividad



Es una distribución de cola larga. Se puede observar que la probabilidad más grande es que los nodos tengan degrees pequeños. Esto es común en las redes biológicas, como lo es el caso de Yeast.

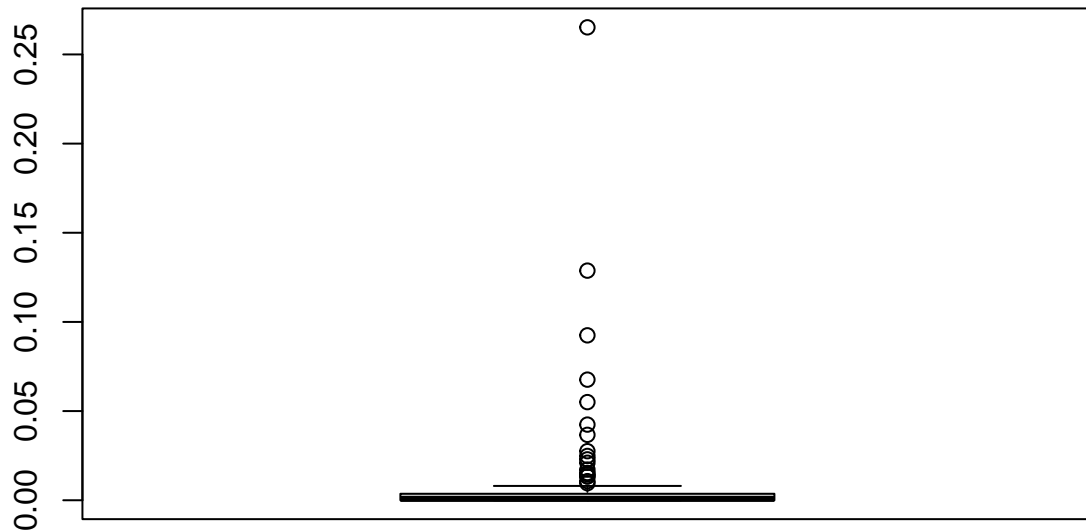
```
boxplot(distlev)
```

- b. Grafique el boxplot de la distribución de conectividades y discuta tu resultado.



#El boxplot indica que al menos el 75% de los nodos tienen entre 1 y 25 conexiones, mientras que la med

```
boxplot(dcl)
```

#la mayoría de los datos tienen probabilidades bajas de tener muchas conexiones, lo cual demuestra que

```
#Calcular el número de conexiones
cnxn <- as.table(degree(yeast))# estoy creando una tabla de frecuencias con los degrees de yeast.
sort(cnxn, decreasing=TRUE) #ordené en orden decreciente
```

c. Encuentre la proporción de nodos que tienen 15 o más conectividades.

##	YPR110C	YPL131W	YNL178W	YIL021W	YOL127W	YJL063C	YBR283C	YLR378C
##	118	115	114	113	113	108	108	108
##	YMR260C	YBR251W	YGL123W	YNL284C	YGL103W	YOL040C	YGR034W	YDL191W
##	107	106	106	106	106	104	104	104
##	YDL136W	YGR220C	YNR037C	YOR063W	YIL018W	YLR344W	YEL050C	YPL183W-A
##	104	104	104	104	104	104	104	102
##	YDR041W	YJR113C	YML010W	YBL038W	YLR075W	YGL068W	YHL015W	YNL189W
##	101	97	95	94	93	91	90	90
##	YJR123W	YBL004W	YDL014W	YLR175W	YBL092W	YNL132W	YDR101C	YNR016C
##	86	73	68	62	62	60	58	58
##	YIL147C	YPR010C	YJL109C	YER016W	YBR257W	YMR290C	YDL029W	YER006W
##	58	57	57	57	57	56	56	55
##	YDR496C	YGR103W	YBR084C-A	YBL027W	YKL009W	YHR203C	YJR145C	YHR052W
##	55	55	55	55	54	54	54	53

##	YPR016C	YGR090W	YBR146W	YDR237W	YNL271C	YOR116C	YPL093W	YPR187W
##	53	53	53	53	53	52	52	52
##	YOR207C	YMR310C	YGR283C	YNL002C	YPL012W	YMR049C	YNL306W	YOR341W
##	52	52	52	51	51	50	50	49
##	YGL059W	YIL042C	YML025C	YOL077C	YOR272W	YGL205W	YGL211W	YBR234C
##	48	48	47	46	46	46	45	45
##	YDR116C	YNL061W	YHR147C	YDL140C	YPL043W	YGR145W	YMR158W	YDL061C
##	44	44	44	43	43	43	43	43
##	YPR166C	YLR388W	YDR036C	YGL147C	YNL067W	YLR367W	YJL190C	YGR085C
##	43	43	42	42	42	42	42	42
##	YPR102C	YBR048W	YKL173W	YMR188C	YOR151C	YMR125W	YDR025W	YLR197W
##	42	42	42	41	41	41	41	40
##	YML026C	YKL170W	YOR206W	YDR450W	YDR012W	YNL177C	YJL177W	YKL180W
##	40	40	40	40	40	40	40	40
##	YBR031W	YER117W	YBL087C	YDR127W	YBR208C	YNL081C	YCR031C	YJL191W
##	40	40	40	39	39	39	39	39
##	YHR197W	YPL126W	YKR081C	YOR150W	YIL133C	YDR394W	YLR340W	YNL069C
##	38	38	38	38	38	37	37	37
##	YKL113C	YLR409C	YDL185W	YKL145W	YDR449C	YPL231W	YMR143W	YDL083C
##	37	36	36	36	36	36	36	36
##	YPL212C	YKL104C	YEL054C	YDR418W	YPL220W	YGL135W	YHR148W	YNL292W
##	36	35	35	35	35	35	35	35
##	YGR118W	YNL185C	YLL008W	YNR036C	YPR132W	YDL202W	YKL192C	YML049C
##	35	35	34	34	34	34	34	34
##	YFL001W	YGL063W	YDR117C	YBR247C	YDR337W	YER029C	YBR154C	YLR423C
##	34	34	34	34	33	33	32	32
##	YOR210W	YER082C	YDR324C	YER126C	YML009C	YNL244C	YPL227C	YNL110C
##	32	32	32	32	32	32	32	32
##	YHL004W	YKL014C	YDL031W	YKR060W	YPL211W	YCL059C	YKL024C	YDR226W
##	32	31	31	31	31	31	31	31
##	YER170W	YLR244C	YBL091C	YMR208W	YGR162W	YKL182W	YLR147C	YDL227C
##	31	31	31	31	30	30	30	30
##	YGL111W	YJR014W	YHL030W	YGL120C	YJR002W	YML054C	YJR008W	YPR183W
##	29	29	28	28	28	28	28	28
##	YDR162C	YMR314W	YLR129W	YNL236W	YER061C	YNL123W	YBR041W	YHR088W
##	28	27	27	27	27	27	27	27
##	YOL041C	YLL036C	YGR245C	YOR180C	YAL035W	YHR041C	YMR093W	YNL137C
##	26	26	26	26	26	26	26	26
##	YOR093C	YBR222C	YMR012W	YMR128W	YLR284C	YDR060W	YHR009C	YJR016C
##	26	26	25	25	25	25	25	25
##	YLR275W	YGL049C	YGR158C	YGL019W	YHR200W	YGR095C	YGR195W	YOL021C
##	25	24	24	24	24	24	24	24
##	YCR057C	YER012W	YBL013W	YBR029C	YDR283C	YPR033C	YIL035C	YMR190C
##	24	24	24	24	24	24	24	24
##	YOR061W	YBR193C	YER022W	YKL172W	YOR174W	YGL245W	YGR240C	YLR186W
##	23	23	23	23	23	23	23	23
##	YML064C	YNL256W	YPL151C	YOL135C	YOL051W	YLR071C	YFR052W	YLR222C
##	23	23	23	23	23	23	22	22
##	YFR004W	YKL067W	YER069W	YJR109C	YIL061C	YLR002C	YPL217C	YDR427W
##	22	22	22	22	22	22	22	22
##	YJR091C	YPL028W	YIL160C	YPR144C	YMR288W	YGR104C	YDL148C	YML007W
##	22	22	22	22	22	22	22	22
##	YEL061C	YER090W	YER021W	YOR261C	YOR117W	YDR087C	YBR055C	YIL116W
##	22	21	21	21	21	21	21	21

##	YLR117C	YDR299W	YMR112C	YDL030W	YLR449W	YNL182C	YOR335C	YDR148C
##	21	21	21	21	21	21	21	21
##	YOL120C	YGL151W	YNL301C	YCR081W	YPR070W	YNR010W	YPR178W	YDR272W
##	21	21	21	21	21	21	21	21
##	YHR058C	YOR040W	YDR443C	YJR057W	YML004C	YDR280W	YER081W	YCL030C
##	21	21	21	21	21	20	20	20
##	YDL007W	YDL111C	YHR069C	YOR259C	YPR108W	YJR007W	YOR001W	YPR168W
##	20	20	20	20	20	20	20	20
##	YIL093C	YHR114W	YNL088W	YNR033W	YER133W	YPR067W	YLL027W	YNL005C
##	20	20	20	20	20	20	20	20
##	YHR208W	YIL154C	YOL142W	YDR292C	YJR148W	YCL054W	YOR039W	YDL097C
##	20	20	20	20	20	20	19	19
##	YGR013W	YDR240C	YPR190C	YOR145C	YKL060C	YKL012W	YDL087C	YPL213W
##	19	19	19	19	19	19	19	19
##	YKL216W	YPL252C	YPL042C	YGL025C	YGR128C	YOR326W	YBR221C	YIL125W
##	19	19	19	19	19	18	18	18
##	YLR447C	YDL147W	YBR160W	YPL266W	YKL144C	YKR002W	YFL002C	YER155C
##	18	18	18	18	18	18	18	18
##	YMR024W	YMR262W	YBL055C	YAL054C	YBR115C	YNL168C	YHR206W	YFL033C
##	18	18	18	18	18	18	18	18
##	YLR006C	YJR017C	YNL113W	YGR091W	YMR047C	YER052C	YNL075W	YLL011W
##	18	18	17	17	17	17	17	17
##	YJL130C	YLR424W	YDR454C	YOL023W	YNL026W	YMR300C	YER110C	YJR070C
##	17	17	17	17	17	17	17	17
##	YJL020C	YLR276C	YGL048C	YMR061W	YJL203W	YER178W	YNL071W	YGL112C
##	17	17	17	16	16	16	16	16
##	YFL018C	YCL017C	YJR093C	YLR355C	YLR153C	YDR308C	YDR416W	YML022W
##	16	16	16	16	16	16	16	16
##	YDL051W	YBL026W	YCL009C	YLR106C	YHR026W	YDR064W	YLR231C	YPL234C
##	16	16	16	16	16	16	16	16
##	YGR214W	YLR048W	YPL214C	YHR189W	YJL218W	YNR053C	YDR235W	YEL021W
##	16	16	16	16	16	16	16	16
##	YPL148C	YPR113W	YDR441C	YGR193C	YOR221C	YGR194C	YGL026C	YFR001W
##	16	16	16	16	16	16	15	15
##	YLR347C	YJL138C	YNR003C	YGL011C	YGR263C	YHR018C	YBR253W	YDR140W
##	15	15	15	15	15	15	15	15
##	YHR030C	YER127W	YDL239C	YDR007W	YLR115W	YAL043C	YEL027W	Q0130
##	15	15	15	15	15	15	15	15
##	YPL017C	YOL066C	YNR074C	YHL016C	YPL091W	YLR180W	YNL072W	YML094W
##	15	15	15	15	15	15	15	15
##	YER050C	YLR058C	YBR088C	YDR428C	YDL142C	YDL209C	YOL060C	YLR277C
##	15	15	15	15	15	15	15	15
##	YOR224C	YOR260W	YER094C	YDR301W	YDR211W	YOR362C	YBR142W	YLR421C
##	15	14	14	14	14	14	14	14
##	YKL003C	YLL041C	YOR111W	YNL063W	YKL018W	YNL317W	YGR156W	Q0045
##	14	14	14	14	14	14	14	14
##	Q0250	YKL059C	YOR308C	YML046W	YEL058W	YBR119W	YDL238C	YBR281C
##	14	14	14	14	14	14	14	14
##	YMR278W	YLR298C	YMR240C	YJR069C	YPR043W	YKR038C	YDL104C	YBR263W
##	14	14	14	14	14	14	14	14
##	YJR137C	YIL094C	YHR062C	YDR129C	YJL069C	YKR048C	YBR248C	YOR332W
##	14	14	14	14	14	14	14	13
##	YLR291C	YOR310C	YDR448W	YDR158W	YBR127C	YDR195W	YGR135W	YCR035C
##	13	13	13	13	13	13	13	13

##	YML092C	YBR081C	YBR218C	YCR046C	YLR029C	YHR066W	YFR044C	YHR170W
##	13	13	13	13	13	13	13	13
##	YPL013C	YLR200W	YKL099C	YHR086W	YDR502C	YPR103W	YHR111W	YHR038W
##	13	13	13	13	13	13	13	13
##	YBR189W	YPL081W	YPR060C	YKR001C	YOR285W	YNR058W	Q0275	YNL232W
##	13	13	13	13	13	13	13	13
##	YPR107C	YCR003W	YOR274W	YGR244C	YGR021W	YJL121C	YGR084C	YDR347W
##	13	13	13	13	13	13	13	13
##	YDR404C	YPL118W	YGL236C	YKL155C	YOR131C	YGL129C	YNL073W	YMR121C
##	13	13	13	13	13	13	13	13
##	YPL069C	YDR037W	YNL220W	YJL172W	YLR009W	YGL105W	YOL149W	YMR309C
##	13	13	13	13	13	13	12	12
##	YDR298C	YJR121W	YAL032C	YGR020C	YOL038W	YFR037C	YGL195W	YJL005W
##	12	12	12	12	12	12	12	12
##	YGR232W	YGR267C	YER002W	YIL033C	YOL139C	YBR039W	YDL004W	YBL099W
##	12	12	12	12	12	12	12	12
##	YPR024W	YLR289W	YGL030W	YDR322W	YOR076C	YLR022C	YDR018C	YIR042C
##	12	12	12	12	12	12	12	12
##	YDL043C	YNL222W	YKR009C	YPR073C	YBR003W	YJL167W	YER171W	YCL004W
##	12	12	12	12	12	12	12	12
##	YJL046W	YDR364C	YGR252W	YEL051W	YHR020W	YBR042C	YDR328C	YLR208W
##	12	12	12	12	12	12	11	11
##	YDL160C	YDL116W	YDL060W	YDR388W	YPL135W	YJL088W	YOR142W	YGL009C
##	11	11	11	11	11	11	11	11
##	YMR239C	YBL041W	YNL262W	YGR218W	YOL004W	YCR053W	YBR200W	YMR229C
##	11	11	11	11	11	11	11	11
##	YDL100C	YDL226C	YEL015W	YCR028C-A	YER017C	YHR025W	YDL168W	YDR236C
##	11	11	11	11	11	11	11	11
##	YJR047C	YMR294W	YIR027C	YDL052C	YGR278W	YLR439W	YMR178W	YKL184W
##	11	11	11	11	11	11	11	11
##	YGR112W	YNL218W	YLR143W	YKR031C	YOL005C	YMR089C	YEL034W	YDR175C
##	11	11	11	11	11	11	11	11
##	YDL213C	YOR226C	YOR286W	YCR077C	YKR068C	YGL137W	YPL111W	YCR012W
##	11	11	11	10	10	10	10	10
##	YDL047W	YKR025W	YJR063W	YIL078W	YKL143W	YJL001W	YLR438W	YGL207W
##	10	10	10	10	10	10	10	10
##	YHR196W	YOR202W	YPL198W	YOR047C	YMR286W	YGL076C	Q0085	YPR004C
##	10	10	10	10	10	10	10	10
##	YBL080C	YBR002C	YMR101C	YDL193W	YER095W	YOR065W	YBR198C	YHR129C
##	10	10	10	10	10	10	10	10
##	YOR196C	YOR236W	YGL037C	YMR074C	YGR207C	YPL082C	YOR241W	YDL150W
##	10	10	10	10	10	10	10	10
##	YMR113W	YOL121C	YJR024C	YGL062W	YGR274C	YJL189W	YGL018C	YPR101W
##	10	10	10	10	10	10	10	10
##	YKL194C	YKL151C	YJR117W	YPL178W	YCR072C	YMR242C	YOR312C	YML015C
##	10	10	10	10	10	10	10	10
##	YGR074W	YHR106W	YGL169W	YDR076W	YJR139C	YDR353W	YER057C	YPL008W
##	10	10	10	10	10	10	10	10
##	YKL132C	YEL024W	YIL051C	YBR288C	YAL040C	YMR236W	YPL237W	YNL248C
##	10	10	10	10	10	10	10	10
##	YGR253C	YOL143C	YNL302C	YDR473C	YER112W	YLR166C	YMR205C	YPR167C
##	10	10	10	9	9	9	9	9
##	YGL190C	YDL145C	YOR136W	YKR069W	YNL104C	YBR009C	YGL171W	YPR191W
##	9	9	9	9	9	9	9	9

##	YGR155W	YDR167W	YAL033W	YLR288C	YDR311W	YBR025C	YDR074W	YBL007C
##	9	9	9	9	9	9	9	9
##	YGL127C	YMR118C	YKL141W	YOR128C	YGR180C	YCR036W	YGL143C	YIL103W
##	9	9	9	9	9	9	9	9
##	YOR278W	YDL045C	YIR022W	YDL182W	YLR406C	YML110C	YER074W	YIL069C
##	9	9	9	9	9	9	9	9
##	YKL211C	YLR328W	YDL075W	YDR145W	YDR196C	YGL128C	YMR287C	YDR462W
##	9	9	9	9	9	9	9	9
##	YGL091C	YLR281C	YLR359W	YBR019C	YOL114C	YMR315W	YNL151C	YIL003W
##	9	9	9	9	9	9	9	9
##	YKL191W	YML051W	YDR293C	YBR196C	YBL105C	YDR054C	YOL140W	YMR193W
##	9	9	9	9	9	9	9	8
##	YHR107C	YOL058W	YNL287W	YDL188C	YKR026C	YGL234W	YPL139C	YJR042W
##	8	8	8	8	8	8	8	8
##	YGR186W	YPL204W	YOL086C	YGR204W	YNL085W	YBR103W	YLL018C	YFL045C
##	8	8	8	8	8	8	8	8
##	YOR167C	YBR153W	YGR010W	YDR242W	Q0105	YGL221C	YHR168W	YBR176W
##	8	8	8	8	8	8	8	8
##	YAR015W	YNL162W	YHR141C	YHL032C	YOR108W	YBR270C	YGR019W	YML106W
##	8	8	8	8	8	8	8	8
##	YER157W	YMR271C	YDL055C	YNL241C	YML059C	YDL205C	YGR113W	YFR050C
##	8	8	8	8	8	8	8	8
##	YKR087C	YER087W	YDR004W	YCR019W	YJR105W	YER179W	YOR209C	YPR035W
##	8	8	8	8	8	8	8	8
##	YBR084W	YDR539W	YJL092W	YMR084W	YDL131W	YOR168W	YOL033W	YKL156W
##	8	8	8	8	8	8	8	8
##	YOR122C	YBR245C	YDR432W	YLR074C	YGR120C	YMR293C	YHR021C	YOL148C
##	8	8	8	8	8	8	8	8
##	YMR146C	YJL124C	YJL098W	YNL147W	YFR040W	YNL118C	YFL022C	YNR012W
##	7	7	7	7	7	7	7	7
##	YCL010C	YAL044C	YBL033C	YGR083C	YER025W	YFR051C	YGR262C	YDR378C
##	7	7	7	7	7	7	7	7
##	YIL076W	YOR184W	YGL070C	YJR111C	YFL038C	YDL134C	YBR272C	YDL132W
##	7	7	7	7	7	7	7	7
##	YNL112W	YLR212C	YOL006C	YIL126W	YOR323C	YJR068W	YMR217W	YDR510W
##	7	7	7	7	7	7	7	7
##	YDR115W	YDR259C	YMR267W	YPL124W	YIL020C	YPR088C	YLR295C	YMR153W
##	7	7	7	7	7	7	7	7
##	YMR150C	YER055C	YAL038W	YER154W	YLR264W	YDR086C	YPR074C	YBR117C
##	7	7	7	7	7	7	7	7
##	YDR050C	YNL092W	YGR231C	YPR082C	YGL148W	YKL040C	YLR342W	YER168C
##	7	7	7	7	7	7	7	7
##	YGR132C	YPR086W	YGR276C	YML021C	YHR046C	YOR014W	YIL084C	YDR287W
##	7	7	7	7	7	7	7	7
##	YOL071W	YPL160W	YGR012W	YFL030W	YMR090W	YJR149W	YER004W	YLR107W
##	7	7	7	7	7	7	7	7
##	YBR166C	YDR341C	YIL074C	YGL094C	YOL126C	YOL080C	YJR060W	YFL005W
##	7	7	7	7	7	7	7	7
##	YCL029C	YKR054C	YFL039C	YKR028W	YGL044C	YOL082W	YDR238C	YGR061C
##	7	7	7	7	7	7	7	7
##	YOR158W	YJL187C	YMR035W	YOR347C	YHR091C	YOR095C	YBL019W	YML085C
##	7	7	7	7	7	7	7	7
##	YIL106W	YIL062C	YGL220W	YLR370C	YKL057C	YGL122C	YDR228C	YDL225W
##	6	6	6	6	6	6	6	6

##	YFR030W	YDR354W	YJL026W	YJL014W	YBR256C	YOR270C	YNR035C	YAL016W
##	6	6	6	6	6	6	6	6
##	YJR065C	YBR079C	YOR304W	YCR093W	YKL013C	YBL002W	YKL001C	YMR213W
##	6	6	6	6	6	6	6	6
##	YDR385W	YMR116C	YPR137W	YGL099W	YPL254W	YKR067W	YMR172W	YMR268C
##	6	6	6	6	6	6	6	6
##	YHR059W	YBL039C	YGL092W	YNL016W	YMR223W	YPR047W	YLR245C	YLR060W
##	6	6	6	6	6	6	6	6
##	YFL059W	YCL018W	YOR303W	YML125C	YDR487C	YDR408C	YMR054W	YGR144W
##	6	6	6	6	6	6	6	6
##	YOR361C	YGR210C	YNL122C	YDL235C	YHL014C	YGR286C	YPR002W	YGL031C
##	6	6	6	6	6	6	6	6
##	YDL112W	YOR201C	YLR167W	YPL070W	YOR133W	YGL133W	YPL011C	YGR005C
##	6	6	6	6	6	6	6	6
##	YDR336W	YMR023C	YKR072C	YJL140W	YMR263W	YGR175C	YAL062W	YDL201W
##	6	6	6	6	6	6	6	6
##	YGR169C	YDL174C	YDL178W	YEL071W	YBL061C	YLR011W	YDL036C	YLR382C
##	6	6	6	6	6	6	6	6
##	YOL095C	YLR308W	YDL078C	YDL141W	YLR165C	YLR307W	YBR023C	YGL252C
##	6	6	6	6	6	6	6	6
##	YBR011C	YKL085W	YJL095W	YEL003W	YGR092W	YOR290C	YDL102W	YNL079C
##	6	6	6	6	6	6	6	6
##	YGR078C	YNL153C	YPL235W	YER070W	YKL081W	YIL034C	YHR019C	YOR089C
##	6	6	6	6	6	6	6	6
##	YPL172C	YGR101W	YGR255C	YBL098W	YML086C	YLL057C	YDL143W	YPR029C
##	6	6	6	6	6	6	6	5
##	YGL115W	YOL094C	YBL045C	YBR126C	YGL237C	YBR135W	YIR001C	YKL103C
##	5	5	5	5	5	5	5	5
##	YIL142W	YLR025W	YNL330C	YGL156W	YPL181W	YMR199W	YER177W	YMR120C
##	5	5	5	5	5	5	5	5
##	YPL256C	YIL128W	YGL197W	YMR308C	YHR024C	YBR060C	YDR381W	YGR234W
##	5	5	5	5	5	5	5	5
##	YOR181W	YGR161C	YGR200C	YLR310C	YDR300C	YDL098C	YIL070C	YOR035C
##	5	5	5	5	5	5	5	5
##	YPL258C	YML069W	YJR104C	YGL198W	YCR086W	YJR049C	YNL200C	YGL153W
##	5	5	5	5	5	5	5	5
##	YIL066C	YJL093C	YDR429C	YNR057C	YDR062W	YNL086W	YPR026W	YDL089W
##	5	5	5	5	5	5	5	5
##	YDR264C	YGR148C	YLR028C	YDL203C	YGR134W	YJR010W	YBL076C	YKL150W
##	5	5	5	5	5	5	5	5
##	YBR252W	YIL043C	YBR018C	YBR213W	YLR357W	YAL046C	YPL059W	YDR296W
##	5	5	5	5	5	5	5	5
##	YNL316C	YEL070W	YOL059W	YPL010W	YNL288W	YPL132W	YLR386W	YHR210C
##	5	5	5	5	5	5	5	5
##	YNR073C	YER037W	YDL022W	YKL002W	YMR130W	YFR009W	YDL081C	YNR071C
##	5	5	5	5	5	5	5	5
##	YMR009W	YNL030W	YDR147W	YBR094W	YDR268W	YDR111C	YGR094W	YPL246C
##	5	5	5	5	5	5	5	5
##	YOL097C	YJL060W	YEL038W	YPL279C	YOR390W	YNL037C	YLR089C	YGL224C
##	5	5	5	5	5	5	5	5
##	YOR375C	YPL206C	YHR032W	YBR053C	YPL110C	YDR338C	YHR128W	YER183C
##	5	5	5	5	5	5	5	5
##	YLR163C	YGL154C	YKR059W	YPL016W	YAL041W	YER125W	YDR389W	YOR265W
##	5	5	5	5	5	5	5	5

##	YFL037W	YHR118C	YOR098C	YLR234W	YDR212W	YER173W	YPL269W	YHR158C
##	5	5	5	5	5	5	5	5
##	YER107C	YJL061W	YGL106W	YNR052C	YHR099W	YGL100W	YBR249C	YDL153C
##	5	5	5	5	5	5	5	5
##	YLR337C	YDR023W	YEL041W	YDR489W	YDR232W	YMR296C	YKR037C	YOR356W
##	5	5	5	5	5	5	5	5
##	YML087C	YOL145C	YOL064C	YLR133W	YGR062C	YNL243W	YDL207W	YBR087W
##	5	5	5	5	5	5	5	4
##	YNL078W	YPR051W	YJL041W	YER174C	YLR314C	YJR076C	YNL207W	YAL021C
##	4	4	4	4	4	4	4	4
##	YHR166C	YDR359C	YHR033W	YOR244W	YPR181C	YJL081C	YKL007W	YGL241W
##	4	4	4	4	4	4	4	4
##	YFL024C	YJR022W	YPR023C	YJL080C	YKL218C	YJR043C	YML109W	YHR169W
##	4	4	4	4	4	4	4	4
##	YIR002C	YDL108W	YNL138W	YPL086C	YDR386W	YBR109C	YBL003C	YDR071C
##	4	4	4	4	4	4	4	4
##	YOR269W	YGL061C	YJL045W	YJR051W	YKL148C	YPL255W	YBR072W	YDR174W
##	4	4	4	4	4	4	4	4
##	YBR217W	YGR136W	YJR102C	YDR488C	YNL022C	YDR270W	YGL040C	YBR227C
##	4	4	4	4	4	4	4	4
##	YBR295W	YML126C	YIL145C	YGR119C	YDL065C	YOR119C	YDR047W	YCR009C
##	4	4	4	4	4	4	4	4
##	YHR042W	YER091C	YOR327C	YPR048W	YNL251C	YBR061C	YMR048W	YLR035C
##	4	4	4	4	4	4	4	4
##	YGL136C	YDR009W	YLR324W	YDR538W	YGL181W	YNL082W	YCL037C	YDL236W
##	4	4	4	4	4	4	4	4
##	YDL171C	YPL022W	YDL130W	YNL036W	YPL188W	YPL190C	YMR250W	YPL164C
##	4	4	4	4	4	4	4	4
##	YDR294C	YBR020W	YNL129W	YER043C	YMR186W	YGR192C	YFR036W	YDR019C
##	4	4	4	4	4	4	4	4
##	YFR047C	YOR004W	YOR137C	YHR028C	YOL043C	YKR080W	YMR177W	YHR012W
##	4	4	4	4	4	4	4	4
##	YHL022C	YOR171C	YBR243C	YLR361C	YDR339C	YML075C	YHR179W	YAL015C
##	4	4	4	4	4	4	4	4
##	YKR079C	YCR024C	YNL011C	YOL123W	YGL213C	YHR089C	YBL079W	YKL079W
##	4	4	4	4	4	4	4	4
##	YGR208W	YIR006C	YJL194W	YGL206C	YPR141C	YGL216W	YOL115W	YER105C
##	4	4	4	4	4	4	4	4
##	YAL009W	YNL298W	YDL020C	YNL064C	YDR138W	YNL272C	YIR008C	YDR098C
##	4	4	4	4	4	4	4	4
##	YPR055W	YDL155W	YDR020C	YPL031C	YDR176W	YBR170C	YCR002C	YFL009W
##	4	4	4	4	4	4	4	4
##	YOR217W	YDR028C	YML063W	YPR112C	YOR227W	YPL161C	YMR094W	YPR121W
##	4	4	4	4	4	4	4	4
##	YMR231W	YMR032W	YDR425W	YEL047C	YPL174C	YBL024W	YPL104W	YNL247W
##	4	4	4	4	4	4	4	4
##	YPL171C	YPL040C	YOR026W	YMR167W	YML117W	YHL001W	YKL006W	YBR038W
##	4	4	4	4	4	4	4	4
##	YLR259C	YGR121C	YMR055C	YHR011W	YOR219C	YLR441C	YKL029C	YNL305C
##	4	4	4	4	4	4	4	4
##	YPL224C	YDL219W	YMR234W	YGL178W	YGL173C	YPL084W	YLR330W	YDR150W
##	4	4	4	4	4	4	4	4
##	YER027C	YPL203W	YGL208W	YNL099C	YML098W	YGR264C	YDR091C	YHR102W
##	3	3	3	3	3	3	3	3

##	YBR260C	YDL126C	YHR216W	YER026C	YOR250C	YBR059C	YER086W	YAL029C
##	3	3	3	3	3	3	3	3
##	YDL006W	YDL192W	YNL333W	YPL049C	YNL261W	YKR014C	YGL022W	YOR043W
##	3	3	3	3	3	3	3	3
##	YNL124W	YEL002C	YJR101W	YDL220C	YOR340C	YNL290W	YER031C	YMR105C
##	3	3	3	3	3	3	3	3
##	YNL154C	YPL001W	YDR472W	YBL058W	YBR282W	YDR507C	YMR139W	YMR108W
##	3	3	3	3	3	3	3	3
##	YHR174W	YER003C	YML091C	YLR293C	YLR127C	YMR095C	YAL023C	YER092W
##	3	3	3	3	3	3	3	3
##	YHR085W	YDL195W	YIL063C	YLR371W	YNL139C	YML032C	YHR023W	YBL090W
##	3	3	3	3	3	3	3	3
##	YOR144C	YNL135C	YGR040W	YPL153C	YER008C	YLR398C	YDR480W	YMR025W
##	3	3	3	3	3	3	3	3
##	YJR090C	YIL046W	YGR268C	YFL023W	YOR036W	YDR084C	YGR171C	YNL258C
##	3	3	3	3	3	3	3	3
##	YLL049W	YKL130C	YHR163W	YOR284W	YGR248W	YCR073W-A	YNR034W	YDR376W
##	3	3	3	3	3	3	3	3
##	YLR052W	YLR417W	YJL199C	YDR016C	YOL069W	YER042W	YLR377C	YDR201W
##	3	3	3	3	3	3	3	3
##	YBR137W	YIL053W	YOL055C	YGL079W	YGL161C	YPR028W	YGR172C	YGR188C
##	3	3	3	3	3	3	3	3
##	YGL175C	YLR209C	YNL334C	YER096W	YKR083C	YNL044W	YCL064C	YPR131C
##	3	3	3	3	3	3	3	3
##	YKR092C	YGR246C	YKL088W	YBL074C	YMR077C	YBL036C	YLR148W	YBR279W
##	3	3	3	3	3	3	3	3
##	YPL045W	YLR396C	YDL058W	YPR173C	YOR054C	YNL097C	YIL083C	YGL256W
##	3	3	3	3	3	3	3	3
##	YBL022C	YIL167W	YBR191W	YLR418C	YBR024W	YNR069C	YNL041C	YDL033C
##	3	3	3	3	3	3	3	3
##	YNL192W	YPR201W	YLR401C	YLR405W	YBR121C	YPR081C	YML096W	YCR059C
##	3	3	3	3	3	3	3	3
##	YHR013C	YNL155W	YLR105C	YPL079W	YNR015W	YLR174W	YML080W	YLR109W
##	3	3	3	3	3	3	3	3
##	YNL142W	YDL166C	YLR450W	YPR145W	YPR138C	YLR260W	YKR050W	YJR103W
##	3	3	3	3	3	3	3	3
##	YDL177C	YNL009W	YOR052C	YBR022W	YMR200W	YNR027W	YBL062W	YBR034C
##	3	3	3	3	3	3	3	3
##	YDR392W	YOR349W	YNL070W	YJL034W	YDR156W	YLR103C	YKL205W	YKL074C
##	3	3	3	3	3	3	3	3
##	YCR088W	YGR009C	YHR142W	YPL241C	YBR082C	YNL233W	YDR245W	YKL068W
##	3	3	3	3	3	3	3	3
##	YGR229C	YGR140W	YKL048C	YFR019W	YER007W	YJR075W	YEL029C	YNL126W
##	3	3	3	3	3	3	3	3
##	YIL002C	YLR305C	YML103C	YKL135C	YDR477W	YOR358W	YGR250C	YOL061W
##	3	3	3	3	3	3	3	3
##	YDR490C	YNL032W	YFL008W	YGL233W	YER136W	YKR024C	YMR226C	YDL066W
##	3	3	3	3	3	3	3	3
##	YHR135C	YJR132W	YMR091C	YLR044C	YHR064C	YDL002C	YMR096W	YBR098W
##	3	3	3	3	3	3	3	3
##	YGR178C	YJL052W	YPR040W	YJR009C	YIL075C	YJL058C	YLR135W	YMR038C
##	3	3	3	3	3	3	3	3
##	YGL172W	YNL047C	YNR041C	YMR001C	YPR175W	YPR041W	YBR037C	YGL043W
##	3	3	3	3	3	3	3	3

##	YGR124W	YAR008W	YJL129C	YDR035W	YIL162W	YKL094W	YOR216C	YAR019C
##	3	3	3	3	3	3	3	3
##	YBR229C	YMR235C	YLR079W	YBR237W	YJL030W	YOL076W	YHR004C	YLR268W
##	3	3	3	3	3	3	3	3
##	YNL106C	YML095C-A	YKL166C	YDR460W	YPL259C	YBL046W	YIL112W	YLR015W
##	3	3	2	2	2	2	2	2
##	YHL019C	YNL056W	YGR086C	YFR049W	YIL050W	YBL021C	YER059W	YMR189W
##	2	2	2	2	2	2	2	2
##	YPR066W	YGR048W	YLR170C	YJL164C	YNR006W	YML100W	YJL074C	YBR130C
##	2	2	2	2	2	2	2	2
##	YLR432W	YCR033W	YNL201C	YOR056C	YEL056W	YML102W	YDR188W	YDR001C
##	2	2	2	2	2	2	2	2
##	YER146W	YPR054W	YPL004C	YAL003W	YOL090W	YDL003W	YPL195W	YJL173C
##	2	2	2	2	2	2	2	2
##	YBR254C	YKR085C	YLR352W	YER093C	YPR182W	YDR225W	YOR368W	YOR204W
##	2	2	2	2	2	2	2	2
##	YAL012W	YGR150C	YOR329C	YOL010W	YBR136W	YGL130W	YHR119W	YEL055C
##	2	2	2	2	2	2	2	2
##	YLL034C	YLR229C	YDR130C	YDL175C	YGR270W	YNL311C	YBR017C	YHL011C
##	2	2	2	2	2	2	2	2
##	YDR049W	YNL312W	YAR002W	YAL025C	YGL187C	YPL009C	YGL008C	YIL068C
##	2	2	2	2	2	2	2	2
##	YDL167C	YPR105C	YDL161W	YJL036W	YPR046W	YER144C	YIL105C	YOR155C
##	2	2	2	2	2	2	2	2
##	YCR082W	YOR212W	YOR020C	YEL005C	YKL008C	YDL139C	YGL134W	YHR113W
##	2	2	2	2	2	2	2	2
##	YNR007C	YMR124W	YBR228W	YIR016W	YNL259C	YEL066W	YDR453C	YCL020W
##	2	2	2	2	2	2	2	2
##	YLR287C	YHR185C	YHR044C	YHR043C	YDR520C	YPR193C	YOR275C	YKR007W
##	2	2	2	2	2	2	2	2
##	YDR229W	YML008C	YPL077C	YCL019W	YLR345W	YLR362W	YIL132C	YML057W
##	2	2	2	2	2	2	2	2
##	YKL061W	YMR068W	YHR171W	YLR125W	YLR182W	YOR059C	YNL263C	YKR022C
##	2	2	2	2	2	2	2	2
##	YGR285C	YHR176W	YDR113C	YGR024C	YDR318W	YFR008W	YER118C	YIL144W
##	2	2	2	2	2	2	2	2
##	YDR189W	YFR013W	YFL003C	YBL102W	YIL052C	YOL018C	YBR267W	YGL186C
##	2	2	2	2	2	2	2	2
##	YER023W	YER148W	YPR003C	YBR065C	YDR121W	YLR092W	YML042W	YGL250W
##	2	2	2	2	2	2	2	2
##	YER056C-A	YDR382W	YML101C	YPL189W	YDR045C	YOL039W	YNR032W	YJR077C
##	2	2	2	2	2	2	2	2
##	YHR074W	YBR294W	YFR002W	YMR298W	YDR505C	YER060W-A	YDL164C	YLR017W
##	2	2	2	2	2	2	2	2
##	YIL155C	YLR207W	YHR193C	YCR010C	YPR062W	YGR256W	YML024W	YGL067W
##	2	2	2	2	2	2	2	2
##	YHR183W	YDR384C	YIR015W	YDR447C	YOL096C	YNL332W	YPL092W	YJR156C
##	2	2	2	2	2	2	2	2
##	YDL244W	YMR114C	YOR176W	YNR002C	YJL094C	YHR100C	YFL058W	YOR251C
##	2	2	2	2	2	2	2	2
##	YGL212W	YGL023C	YBR085W	YJR032W	YKL212W	YLR111W	YDR424C	YPL242C
##	2	2	2	2	2	2	2	2
##	YLR210W	YHL007C	YDR310C	YNL322C	YHR101C	YDR192C	YJL213W	YOR208W
##	2	2	2	2	2	2	2	2

##	YJL035C	YJR118C	YOR194C	YPL018W	YKR010C	YEL031W	YKL073W	YGL217C
##	2	2	2	2	2	2	2	2
##	YJL183W	YFL029C	YGR271W	YMR246W	YFR028C	YGL003C	YOR109W	YGL085W
##	2	2	2	2	2	2	2	2
##	YPL194W	YDR254W	YPR159W	YJL090C	YOR188W	YML124C	YER083C	YER149C
##	2	2	2	2	2	2	2	2
##	YMR307W	YGL240W	YNL250W	YLR189C	YBR289W	YGL251C	YMR129W	YJL099W
##	2	2	2	2	2	2	2	2
##	YPR025C	YEL053C	YPL003W	YPR160W	YCR052W	YPR119W	YPR018W	YDR075W
##	2	2	2	2	2	2	2	2
##	YDR099W	YDL124W	YDR422C	YLL022C	YHR098C	YAR007C	YOL078W	YJR074W
##	2	2	2	2	2	2	2	2
##	YJR064W	YBR175W	YLR321C	YBR225W	YLR262C	YJR006W	YJR144W	YGR233C
##	2	2	2	2	2	2	2	2
##	YLR384C	YDR179C	YDR139C	YDL204W	YKL095W	YDL208W	YDR166C	YJL115W
##	2	2	2	2	2	2	2	2
##	YKL080W	YPR189W	YIR034C	YOR164C	YCL032W	YGR239C	YJR135C	YPL105C
##	2	2	2	2	2	2	2	2
##	YMR159C	YCL055W	YPL002C	YBL016W	YLR190W	YGR058W	YNL161W	YER071C
##	2	2	2	2	2	2	2	2
##	YBR108W	YER062C	YDR233C	YDR261W-A	YPL159C	YLR319C	YPL095C	YLR446W
##	2	2	2	2	2	2	2	2
##	YMR232W	YGR043C	YGR057C	YFL034C-B	YLR354C	YFL010C	YER014W	YLR373C
##	2	2	2	2	2	2	2	2
##	YLR249W	YOR317W	YGL084C	YLR453C	YPL169C	YER060W	YER056C	YGR125W
##	2	2	2	2	2	2	2	2
##	YJR141W	YHL003C	YNR043W	YDR034C	YGR129W	YOR006C	YML079W	YPL090C
##	2	2	2	2	2	2	2	2
##	YBR181C	YNL040W	YDL200C	YIR032C	YKL093W	YDL017W	YDR356W	YBR015C
##	2	2	2	2	2	2	2	2
##	YPR019W	YBR171W	YNL084C	YLR274W	YKL089W	YHR152W	YGR032W	YKL022C
##	2	2	2	2	2	2	2	2
##	YER111C	YER172C	YOR195W	YIL004C	YLR242C	YGL086W	YJL013C	YDR363W
##	2	2	2	2	2	2	2	2
##	YGL163C	YOR058C	YDR149C	YBL056W	YKL045W	YBR125C	YER099C	YDR190C
##	2	2	2	1	1	1	1	1
##	YIL104C	YJR050W	YHR005C	YBR216C	YGR261C	YEL011W	YMR261C	YGR173W
##	1	1	1	1	1	1	1	1
##	YPR104C	YDR342C	YBR195C	YIR005W	YJL042W	YBR010W	YIL071C	YKL122C
##	1	1	1	1	1	1	1	1
##	YIL079C	YKL056C	YKL193C	YDR407C	YLR258W	YOR057W	YBL047C	YOR185C
##	1	1	1	1	1	1	1	1
##	YCL024W	YKR006C	YAR003W	YCL014W	YGR292W	YER162C	YDR412W	YFL006W
##	1	1	1	1	1	1	1	1
##	YPL208W	YJL006C	YPL074W	YGL150C	YFR021W	YBL066C	YKL019W	YLR113W
##	1	1	1	1	1	1	1	1
##	YMR303C	YDL042C	YOR106W	YOR276W	YIL136W	YBR143C	YAL027W	YOR110W
##	1	1	1	1	1	1	1	1
##	YCR020C-A	YER089C	YOR370C	YDR395W	YML095C	YLR304C	YBR133C	YAR014C
##	1	1	1	1	1	1	1	1
##	YDR021W	YLR097C	YDL070W	YDL077C	YGL058W	YNR054C	YEL060C	YPL193W
##	1	1	1	1	1	1	1	1
##	YDR256C	YDR439W	YHL006C	YNL152W	YOR385W	YFR043C	YNL329C	YHR060W
##	1	1	1	1	1	1	1	1

##	YML031W	YHR121W	YEL043W	YDR142C	YHL018W	YDR013W	YJL039C	YLR019W
##	1	1	1	1	1	1	1	1
##	YGL036W	YDR446W	YJR094C	YDL084W	YPR083W	YJL072C	YHR034C	YKL052C
##	1	1	1	1	1	1	1	1
##	YOR034C	YPL133C	YMR204C	YGL192W	YDR277C	YGR223C	YER141W	YBL006C
##	1	1	1	1	1	1	1	1
##	YBR077C	YGR165W	YKL038W	YNL331C	YPR001W	YGL015C	YNL020C	YNR001C
##	1	1	1	1	1	1	1	1
##	YGR004W	YCR087C-A	YLR049C	YCR014C	YCL040W	YOR102W	YLR211C	YML056C
##	1	1	1	1	1	1	1	1
##	YPL088W	YNR039C	YIL109C	YML023C	YGL166W	YGL053W	YGL119W	YML034W
##	1	1	1	1	1	1	1	1
##	YFR017C	YGR071C	YDR479C	YJL086C	YPL109C	YCR095C	YGL125W	YDL165W
##	1	1	1	1	1	1	1	1
##	YML037C	YLR142W	YGL254W	YNR068C	YKL043W	YJL019W	YCR076C	YPL149W
##	1	1	1	1	1	1	1	1
##	YLR030W	YOR037W	YGR066C	YDL218W	YDL237W	YBL068W	YDR100W	YOR243C
##	1	1	1	1	1	1	1	1
##	YDR383C	YPL219W	YDL224C	YDR527W	YPL114W	YDR105C	YDR533C	YJL070C
##	1	1	1	1	1	1	1	1
##	YHR156C	YOR247W	YKR099W	YJR110W	YPR106W	YOL052C	YOR232W	YOR115C
##	1	1	1	1	1	1	1	1
##	YBR187W	YBR056W	YJR097W	YKL186C	YGR209C	YPR126C	YJR133W	YHL009C
##	1	1	1	1	1	1	1	1
##	YKL035W	YLR118C	YMR316W	YNL277W	YLR267W	YMR270C	YIR038C	YJL176C
##	1	1	1	1	1	1	1	1
##	YGL189C	YNL054W-B	YER143W	YGR081C	YER151C	YDL044C	YCL063W	YJR048W
##	1	1	1	1	1	1	1	1
##	YNL199C	YML119W	YDR366C	YJR056C	YDR052C	YNL216W	YOR101W	YGR146C
##	1	1	1	1	1	1	1	1
##	YNL280C	YJR159W	YEL062W	YHL021C	YKR094C	YIL148W	YCR020C	YNL320W
##	1	1	1	1	1	1	1	1
##	YDR044W	YHR029C	YLR177W	YOR092W	YBR287W	YOL137W	YHR047C	YER078C
##	1	1	1	1	1	1	1	1
##	YER142C	YBR207W	YNL095C	YML105C	YDR403W	YCR037C	YML060W	YFR006W
##	1	1	1	1	1	1	1	1
##	YLR152C	YOR311C	YNR013C	YLL029W	YDR109C	YER145C	YOR143C	YIL137C
##	1	1	1	1	1	1	1	1
##	YKL106W	YGR070W	YML055W	YMR138W	YNL117W	YHR172W	YLR216C	YJR010C-A
##	1	1	1	1	1	1	1	1
##	YOR182C	YCL027W	YER167W	YML104C	YOR033C	YGR082W	YBR202W	YOL100W
##	1	1	1	1	1	1	1	1
##	YGR006W	YBR050C	YOR254C	YDL028C	YLL043W	YCL061C	YLR085C	YML115C
##	1	1	1	1	1	1	1	1
##	YKL049C	YER114C	YMR149W	YPL065W	YLR206W	YER165W	YOR103C	YMR302C
##	1	1	1	1	1	1	1	1
##	YDL063C	YDL101C	YLL002W	YDR080W	YPL240C	YDR320C	YDL229W	YPL152W
##	1	1	1	1	1	1	1	1
##	YPL218W	YDL049C	YCR048W	YJR040W	YJL002C	YJL054W	YMR104C	YBR188C
##	1	1	1	1	1	1	1	1
##	YNR019W	YMR109W	YMR198W	YCR038C	YGL244W	YNL119W	YLR139C	YML097C
##	1	1	1	1	1	1	1	1
##	YMR106C	YAL020C	YDR323C	YOR085W	YGL116W	YGL124C	YHL027W	YPR135W
##	1	1	1	1	1	1	1	1

##	YGL073W	YBL103C	YDR059C	YKR086W	YOR045W	YMR081C	YAL030W	YCR034W
##	1	1	1	1	1	1	1	1
##	YNR038W	YPR072W	YJL148W	YNL116W	YIR033W	YHR103W	YHR031C	YGR080W
##	1	1	1	1	1	1	1	1
##	YBL051C	YNL121C	YOR157C	YDR469W	YDR022C	YLR192C	YKL189W	YGR196C
##	1	1	1	1	1	1	1	1
##	YHL002W	YOR353C	YNL169C	YDR152W	YDR343C	YGL174W	YDL137W	YNR046W
##	1	1	1	1	1	1	1	1
##	YML065W	YCL028W	YML088W	YLR270W	YOL117W	YLL010C	YDL092W	YDR097C
##	1	1	1	1	1	1	1	1
##	YDR082W	YMR218C	YFR015C	YDR170C	YML077W	YOL093W	YCR030C	YKL028W
##	1	1	1	1	1	1	1	1
##	YDR405W	YGR075C	YBR299W	YEL037C	YFL007W	YDR361C	YNL172W	YML112W
##	1	1	1	1	1	1	1	1
##	YGL060W	YKL082C	YNL242W	YNL210W	YDL090C	YAL036C	YGL158W	YDL095W
##	1	1	1	1	1	1	1	1
##	YFL042C	YDR227W	YJL024C	YBR091C	YGR154C	YKL152C	YEL022W	YPL085W
##	1	1	1	1	1	1	1	1
##	YJL033W	YMR028W	YLL026W	YLR196W	YOL054W	YOL070C	YBR264C	YCR079W
##	1	1	1	1	1	1	1	1
##	YPL140C	YIL113W	YAL059W	YFR011C	YLR399C	YHR016C	YDL159W	YNL023C
##	1	1	1	1	1	1	1	1
##	YHR051W	YHR084W	YCR066W	YDL216C	YDR365C	YPL036W	YOL108C	YNL208W
##	1	1	1	1	1	1	1	1
##	YJR055W	YBL081W	YOR264W	YIL008W	YHR057C	YLR254C	YDR078C	YLR126C
##	1	1	1	1	1	1	1	1
##	YJL184W	YGR122W	YKL197C	YOR159C	YKR088C	YJL151C	YLR440C	YJR125C
##	1	1	1	1	1	1	1	1
##	YOR023C	YJR086W	YML014W	YJL048C	YDR271C	YER106W	YGL170C	YKR100C
##	1	1	1	1	1	1	1	1
##	YER063W	YCR060W	YBR239C	YKL050C	YCL033C	YJL185C	YBR255W	YDL121C
##	1	1	1	1	1	1	1	1
##	YJL068C	YKL142W	YMR233W	YKR034W	YLR239C	YOR028C	YCR005C	YMR163C
##	1	1	1	1	1	1	1	1
##	YAR073W	YOR302W	YKL010C	YBR246W	YPL125W	YGR241C	YDR357C	YLR031W
##	1	1	1	1	1	1	1	1
##	YGR163W	YOR097C	YFR025C	YJR083C	YPL201C	YDR261W-B	YGR170W	YGR161C-C
##	1	1	1	1	1	1	1	1
##	YKR082W	YOR074C	YIL039W	YLR253W	YHR184W	YDR273W	YDR026C	YDR205W
##	1	1	1	1	1	1	1	1
##	YDR252W	YGR189C	YPL023C	YJL153C	YER038C	YLR376C	YJL057C	YGR247W
##	1	1	1	1	1	1	1	1
##	YPR136C	YLR420W	YPR184W	YBL078C	YEL018W	YNL049C	YBR284W	YBR155W
##	1	1	1	1	1	1	1	1
##	YDL013W	YLR072W	YPR172W	YJL180C	YNL273W	YMR280C	YOR318C	YMR030W
##	1	1	1	1	1	1	1	1
##	YCL056C	YOR330C	YEL048C	YOL131W	YLR451W	YPR148C	YLR263W	YBL010C
##	1	1	1	1	1	1	1	1
##	YJR134C	YNL105W	YMR154C	YOR359W	YDR203W	YOR324C	YDR455C	YDL118W
##	1	1	1	1	1	1	1	1
##	YMR133W	YIL122W	YPL233W	YIL007C	YLR185W	YDR500C	YKL023W	YEL013W
##	1	1	1	1	1	1	1	1
##	YOL129W	YLR026C	YAL028W	YDR504C	YDL154W	YLR156W	YLR223C	YNR050C
##	1	1	1	1	1	1	1	1

##	YDR214W	YKL076C	YOR124C	YKL075C	YKL181W	YHR143W-A	YDL088C	YMR067C
##	1	1	1	1	1	1	1	1
##	YBR212W	YOR281C	YFR007W	YDR529C	YPL138C	YGR110W	YLR005W	YDR005C
##	1	1	1	1	1	1	1	1
##	YGL145W	YER128W	YGL225W	YLR112W	YDR194C	YGR185C	YHR130C	YLR303W
##	1	1	1	1	1	1	1	1
##	YDL217C	YHR180W	YDR541C	YLR059C	YER039C	YER180C	YOR289W	YNR048W
##	1	1	1	1	1	1	1	1
##	YAL060W	YNR051C	YBR223C	YOR220W	YIL092W	YDR008C	YNL042W	YLL032C
##	1	1	1	1	1	1	1	1
##	YMR273C	YKL044W	YOL050C	YKL107W	YDR423C	YOR112W	YHR177W	YJR011C
##	1	1	1	1	1	1	1	1
##	YHR014W	YML127W	YPR118W	YNL249C	YLR056W	YDR297W	YGR060W	YGR007W
##	1	1	1	1	1	1	1	1
##	YJL125C	YOL008W	YDR171W	YHR144C	YFL060C	YKL157W	YNL045W	YGL017W
##	1	1	1	1	1	1	1	1
##	YOR005C	YGR202C	YHR201C	YML005W	YHR070W	YMR013C	YJL198W	YPR163C
##	1	1	1	1	1	1	1	1
##	YOR008C	YDR160W	YML062C	YLR335W	YIL095W	YKR042W	YMR039C	YAL013W
##	1	1	1	1	1	1	1	1
##	YAL024C	YIL009W	YDR085C	YMR168C	YLR238W	YHR115C	YDR027C	YDR200C
##	1	1	1	1	1	1	1	1
##	YPR133W-A	YPR111W	YDR146C	YBL085W	YBL023C	YEL032W	YLR045C	YKL139W
##	1	1	1	1	1	1	1	1
##	YGL038C	YHR079C	YLR116W	YIR031C	YLR195C	YGL097W	YNL299W	YHR154W
##	1	1	1	1	1	1	1	1
##	YLR306W	YBR021W	YDR164C	YNL209W	YKL196C	YIL153W	YCR067C	YJL174W
##	1	1	1	1	1	1	1	1
##	YOR297C	YKL126W	YGL226C-A	YDR177W	YMR022W	YER015W	YBR080C	YBL050W
##	1	1	1	1	1	1	1	1
##	YOR257W	YNL102W	YBR097W	YDR495C	YGL095C	YPL155C	YHR202W	YPL209C
##	1	1	1	1	1	1	1	1
##	YGR238C	YNL031C	YGR116W	YBL082C	YHR134W	YIL030C	YNL006W	YKL176C
##	1	1	1	1	1	1	1	1
##	YMR284W	YGL027C	YGR098C	YBL069W	YHR010W	YPR116W	YDR369C	YDR217C
##	1	1	1	1	1	1	1	1
##	YBR215W	YOL068C	YOR025W	YMR224C	YNL171C	YOR160W	YAL026C	YLR425W
##	1	1	1	1	1	1	1	1
##	YNL289W	YMR299C	YOR153W	YKR047W	YIL159W	YDL117W	YLR381W	YJR053W
##	1	1	1	1	1	1	1	1
##	YDR289C	YBR095C	YBR107C	YNL170W	YHR191C	YBR231C	YNL215W	YNL307C
##	1	1	1	1	1	1	1	1
##	YML016C	YCL016C	YJR143C	YOR321W	YKL092C	YLR372W	YOR027W	YER068W
##	1	1	1	1	1	1	1	1
##	YER122C	YKL020C	YDR351W	YLR433C	YKL190W	YLL050C	YLR235C	YNL098C
##	1	1	1	1	1	1	1	1
##	YMR060C							
##	1							

```
mayork15<-cnxn[cnxn>=15] #un subset que selecciona sólo los que tienen 15 o más conexiones.
length(mayork15) #son 441 nodos con más de 15 conexiones.
```

```
## [1] 441
```

```
total<-sum(cnxn)
sum(mayork15)
```

```
## [1] 14848
```

```
proporcion<-((length(mayork15)/length(cnxn))*100)
proporcion
```

```
## [1] 16.85136
```

```
#el 16% de los nodos tienen 15 o más conexiones.
```

```
pr<-(((sum(mayork15)/sum(cnxn))*100))
pr
```

```
## [1] 62.62337
```

```
#los nodos con más de 15 conexiones contribuyen con el 62.62% de todas las conexiones de la red
```

```
degreemax<-sort(distlev, decreasing = TRUE)
degreemax
```

d. Calcule el degree máximo de la red.

```
## YPR110C YPL131W YNL178W YIL021W YOL127W YJL063C YBR283C YLR378C
## 118 115 114 113 113 108 108 108
## YMR260C YBR251W YGL123W YNL284C YGL103W YOL040C YGR034W YDL191W
## 107 106 106 106 106 104 104 104
## YDL136W YGR220C YNR037C YOR063W YIL018W YLR344W YEL050C YPL183W-A
## 104 104 104 104 104 104 104 102
## YDR041W YJR113C YML010W YBL038W YLR075W YGL068W YHL015W YNL189W
## 101 97 95 94 93 91 90 90
## YJR123W YBL004W YDL014W YLR175W YBL092W YNL132W YDR101C YNR016C
## 86 73 68 62 62 60 58 58
## YIL147C YPR010C YJL109C YER016W YBR257W YMR290C YDL029W YER006W
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## YDR496C YGR103W YBR084C-A YBL027W YKL009W YHR203C YJR145C YHR052W
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## YPR016C YGR090W YBR146W YDR237W YNL271C YOR116C YPL093W YPR187W
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## YOR207C YMR310C YGR283C YNL002C YPL012W YMR049C YNL306W YOR341W
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## YGL059W YIL042C YML025C YOL077C YOR272W YGL205W YGL211W YBR234C
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## YDR116C YNL061W YHR147C YDL140C YPL043W YGR145W YMR158W YDL061C
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## YPR166C YLR388W YDR036C YGL147C YNL067W YLR367W YJL190C YGR085C
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##	YHR197W	YPL126W	YKR081C	YOR150W	YIL133C	YDR394W	YLR340W	YNL069C
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##	YOR093C	YBR222C	YMR012W	YMR128W	YLR284C	YDR060W	YHR009C	YJR016C
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##	YNR073C	YER037W	YDL022W	YKL002W	YMR130W	YFR009W	YDL081C	YNR071C
##	5	5	5	5	5	5	5	5
##	YMR009W	YNL030W	YDR147W	YBR094W	YDR268W	YDR111C	YGR094W	YPL246C
##	5	5	5	5	5	5	5	5
##	YOL097C	YJL060W	YEL038W	YPL279C	YOR390W	YNL037C	YLR089C	YGL224C
##	5	5	5	5	5	5	5	5
##	YOR375C	YPL206C	YHR032W	YBR053C	YPL110C	YDR338C	YHR128W	YER183C
##	5	5	5	5	5	5	5	5
##	YLR163C	YGL154C	YKR059W	YPL016W	YAL041W	YER125W	YDR389W	YOR265W
##	5	5	5	5	5	5	5	5
##	YFL037W	YHR118C	YOR098C	YLR234W	YDR212W	YER173W	YPL269W	YHR158C
##	5	5	5	5	5	5	5	5
##	YER107C	YJL061W	YGL106W	YNR052C	YHR099W	YGL100W	YBR249C	YDL153C
##	5	5	5	5	5	5	5	5
##	YLR337C	YDR023W	YEL041W	YDR489W	YDR232W	YMR296C	YKR037C	YOR356W
##	5	5	5	5	5	5	5	5
##	YML087C	YOL145C	YOL064C	YLR133W	YGR062C	YNL243W	YDL207W	YBR087W
##	5	5	5	5	5	5	5	4
##	YNL078W	YPR051W	YJL041W	YER174C	YLR314C	YJR076C	YNL207W	YAL021C

##	4	4	4	4	4	4	4	4
##	YHR166C	YDR359C	YHR033W	YOR244W	YPR181C	YJL081C	YKL007W	YGL241W
##	4	4	4	4	4	4	4	4
##	YFL024C	YJR022W	YPR023C	YJL080C	YKL218C	YJR043C	YML109W	YHR169W
##	4	4	4	4	4	4	4	4
##	YIR002C	YDL108W	YNL138W	YPL086C	YDR386W	YBR109C	YBL003C	YDR071C
##	4	4	4	4	4	4	4	4
##	YOR269W	YGL061C	YJL045W	YJR051W	YKL148C	YPL255W	YBR072W	YDR174W
##	4	4	4	4	4	4	4	4
##	YBR217W	YGR136W	YJR102C	YDR488C	YNL022C	YDR270W	YGL040C	YBR227C
##	4	4	4	4	4	4	4	4
##	YBR295W	YML126C	YIL145C	YGR119C	YDL065C	YOR119C	YDR047W	YCR009C
##	4	4	4	4	4	4	4	4
##	YHR042W	YER091C	YOR327C	YPR048W	YNL251C	YBR061C	YMR048W	YLR035C
##	4	4	4	4	4	4	4	4
##	YGL136C	YDR009W	YLR324W	YDR538W	YGL181W	YNL082W	YCL037C	YDL236W
##	4	4	4	4	4	4	4	4
##	YDL171C	YPL022W	YDL130W	YNL036W	YPL188W	YPL190C	YMR250W	YPL164C
##	4	4	4	4	4	4	4	4
##	YDR294C	YBR020W	YNL129W	YER043C	YMR186W	YGR192C	YFR036W	YDR019C
##	4	4	4	4	4	4	4	4
##	YFR047C	YOR004W	YOR137C	YHR028C	YOL043C	YKR080W	YMR177W	YHR012W
##	4	4	4	4	4	4	4	4
##	YHL022C	YOR171C	YBR243C	YLR361C	YDR339C	YML075C	YHR179W	YAL015C
##	4	4	4	4	4	4	4	4
##	YKR079C	YCR024C	YNL011C	YOL123W	YGL213C	YHR089C	YBL079W	YKL079W
##	4	4	4	4	4	4	4	4
##	YGR208W	YIR006C	YJL194W	YGL206C	YPR141C	YGL216W	YOL115W	YER105C
##	4	4	4	4	4	4	4	4
##	YAL009W	YNL298W	YDL020C	YNL064C	YDR138W	YNL272C	YIR008C	YDR098C
##	4	4	4	4	4	4	4	4
##	YPR055W	YDL155W	YDR020C	YPL031C	YDR176W	YBR170C	YCR002C	YFL009W
##	4	4	4	4	4	4	4	4
##	YOR217W	YDR028C	YML063W	YPR112C	YOR227W	YPL161C	YMR094W	YPR121W
##	4	4	4	4	4	4	4	4
##	YMR231W	YMR032W	YDR425W	YEL047C	YPL174C	YBL024W	YPL104W	YNL247W
##	4	4	4	4	4	4	4	4
##	YPL171C	YPL040C	YOR026W	YMR167W	YML117W	YHL001W	YKL006W	YBR038W
##	4	4	4	4	4	4	4	4
##	YLR259C	YGR121C	YMR055C	YHR011W	YOR219C	YLR441C	YKL029C	YNL305C
##	4	4	4	4	4	4	4	4
##	YPL224C	YDL219W	YMR234W	YGL178W	YGL173C	YPL084W	YLR330W	YDR150W
##	4	4	4	4	4	4	4	4
##	YER027C	YPL203W	YGL208W	YNL099C	YML098W	YGR264C	YDR091C	YHR102W
##	3	3	3	3	3	3	3	3
##	YBR260C	YDL126C	YHR216W	YER026C	YOR250C	YBR059C	YER086W	YAL029C
##	3	3	3	3	3	3	3	3
##	YDL006W	YDL192W	YNL333W	YPL049C	YNL261W	YKR014C	YGL022W	YOR043W
##	3	3	3	3	3	3	3	3
##	YNL124W	YEL002C	YJR101W	YDL220C	YOR340C	YNL290W	YER031C	YMR105C
##	3	3	3	3	3	3	3	3
##	YNL154C	YPL001W	YDR472W	YBL058W	YBR282W	YDR507C	YMR139W	YMR108W
##	3	3	3	3	3	3	3	3
##	YHR174W	YER003C	YML091C	YLR293C	YLR127C	YMR095C	YAL023C	YER092W

##	3	3	3	3	3	3	3	3
##	YHR085W	YDL195W	YIL063C	YLR371W	YNL139C	YML032C	YHR023W	YBL090W
##	3	3	3	3	3	3	3	3
##	YOR144C	YNL135C	YGR040W	YPL153C	YER008C	YLR398C	YDR480W	YMR025W
##	3	3	3	3	3	3	3	3
##	YJR090C	YIL046W	YGR268C	YFL023W	YOR036W	YDR084C	YGR171C	YNL258C
##	3	3	3	3	3	3	3	3
##	YLL049W	YKL130C	YHR163W	YOR284W	YGR248W	YCR073W-A	YNR034W	YDR376W
##	3	3	3	3	3	3	3	3
##	YLR052W	YLR417W	YJL199C	YDR016C	YOL069W	YER042W	YLR377C	YDR201W
##	3	3	3	3	3	3	3	3
##	YBR137W	YIL053W	YOL055C	YGL079W	YGL161C	YPR028W	YGR172C	YGR188C
##	3	3	3	3	3	3	3	3
##	YGL175C	YLR209C	YNL334C	YER096W	YKR083C	YNL044W	YCL064C	YPR131C
##	3	3	3	3	3	3	3	3
##	YKR092C	YGR246C	YKL088W	YBL074C	YMR077C	YBL036C	YLR148W	YBR279W
##	3	3	3	3	3	3	3	3
##	YPL045W	YLR396C	YDL058W	YPR173C	YOR054C	YNL097C	YIL083C	YGL256W
##	3	3	3	3	3	3	3	3
##	YBL022C	YIL167W	YBR191W	YLR418C	YBR024W	YNR069C	YNL041C	YDL033C
##	3	3	3	3	3	3	3	3
##	YNL192W	YPR201W	YLR401C	YLR405W	YBR121C	YPR081C	YML096W	YCR059C
##	3	3	3	3	3	3	3	3
##	YHR013C	YNL155W	YLR105C	YPL079W	YNR015W	YLR174W	YML080W	YLR109W
##	3	3	3	3	3	3	3	3
##	YNL142W	YDL166C	YLR450W	YPR145W	YPR138C	YLR260W	YKR050W	YJR103W
##	3	3	3	3	3	3	3	3
##	YDL177C	YNL009W	YOR052C	YBR022W	YMR200W	YNR027W	YBL062W	YBR034C
##	3	3	3	3	3	3	3	3
##	YDR392W	YOR349W	YNL070W	YJL034W	YDR156W	YLR103C	YKL205W	YKL074C
##	3	3	3	3	3	3	3	3
##	YCR088W	YGR009C	YHR142W	YPL241C	YBR082C	YNL233W	YDR245W	YKL068W
##	3	3	3	3	3	3	3	3
##	YGR229C	YGR140W	YKL048C	YFR019W	YER007W	YJR075W	YEL029C	YNL126W
##	3	3	3	3	3	3	3	3
##	YIL002C	YLR305C	YML103C	YKL135C	YDR477W	YOR358W	YGR250C	YOL061W
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##	YDR490C	YNL032W	YFL008W	YGL233W	YER136W	YKR024C	YMR226C	YDL066W
##	3	3	3	3	3	3	3	3
##	YHR135C	YJR132W	YMR091C	YLR044C	YHR064C	YDL002C	YMR096W	YBR098W
##	3	3	3	3	3	3	3	3
##	YGR178C	YJL052W	YPR040W	YJR009C	YIL075C	YJL058C	YLR135W	YMR038C
##	3	3	3	3	3	3	3	3
##	YGL172W	YNL047C	YNR041C	YMR001C	YPR175W	YPR041W	YBR037C	YGL043W
##	3	3	3	3	3	3	3	3
##	YGR124W	YAR008W	YJL129C	YDR035W	YIL162W	YKL094W	YOR216C	YAR019C
##	3	3	3	3	3	3	3	3
##	YBR229C	YMR235C	YLR079W	YBR237W	YJL030W	YOL076W	YHR004C	YLR268W
##	3	3	3	3	3	3	3	3
##	YNL106C	YML095C-A	YKL166C	YDR460W	YPL259C	YBL046W	YIL112W	YLR015W
##	3	3	2	2	2	2	2	2
##	YHL019C	YNL056W	YGR086C	YFR049W	YIL050W	YBL021C	YER059W	YMR189W
##	2	2	2	2	2	2	2	2
##	YPR066W	YGR048W	YLR170C	YJL164C	YNR006W	YML100W	YJL074C	YBR130C

##	2	2	2	2	2	2	2	2
##	YLR432W	YCR033W	YNL201C	YOR056C	YEL056W	YML102W	YDR188W	YDR001C
##	2	2	2	2	2	2	2	2
##	YER146W	YPR054W	YPL004C	YAL003W	YOL090W	YDL003W	YPL195W	YJL173C
##	2	2	2	2	2	2	2	2
##	YBR254C	YKR085C	YLR352W	YER093C	YPR182W	YDR225W	YOR368W	YOR204W
##	2	2	2	2	2	2	2	2
##	YAL012W	YGR150C	YOR329C	YOL010W	YBR136W	YGL130W	YHR119W	YEL055C
##	2	2	2	2	2	2	2	2
##	YLL034C	YLR229C	YDR130C	YDL175C	YGR270W	YNL311C	YBR017C	YHL011C
##	2	2	2	2	2	2	2	2
##	YDR049W	YNL312W	YAR002W	YAL025C	YGL187C	YPL009C	YGL008C	YIL068C
##	2	2	2	2	2	2	2	2
##	YDL167C	YPR105C	YDL161W	YJL036W	YPR046W	YER144C	YIL105C	YOR155C
##	2	2	2	2	2	2	2	2
##	YCR082W	YOR212W	YOR020C	YEL005C	YKL008C	YDL139C	YGL134W	YHR113W
##	2	2	2	2	2	2	2	2
##	YNR007C	YMR124W	YBR228W	YIR016W	YNL259C	YEL066W	YDR453C	YCL020W
##	2	2	2	2	2	2	2	2
##	YLR287C	YHR185C	YHR044C	YHR043C	YDR520C	YPR193C	YOR275C	YKR007W
##	2	2	2	2	2	2	2	2
##	YDR229W	YML008C	YPL077C	YCL019W	YLR345W	YLR362W	YIL132C	YML057W
##	2	2	2	2	2	2	2	2
##	YKL061W	YMR068W	YHR171W	YLR125W	YLR182W	YOR059C	YNL263C	YKR022C
##	2	2	2	2	2	2	2	2
##	YGR285C	YHR176W	YDR113C	YGR024C	YDR318W	YFR008W	YER118C	YIL144W
##	2	2	2	2	2	2	2	2
##	YDR189W	YFR013W	YFL003C	YBL102W	YIL052C	YOL018C	YBR267W	YGL186C
##	2	2	2	2	2	2	2	2
##	YER023W	YER148W	YPR003C	YBR065C	YDR121W	YLR092W	YML042W	YGL250W
##	2	2	2	2	2	2	2	2
##	YER056C-A	YDR382W	YML101C	YPL189W	YDR045C	YOL039W	YNR032W	YJR077C
##	2	2	2	2	2	2	2	2
##	YHR074W	YBR294W	YFR002W	YMR298W	YDR505C	YER060W-A	YDL164C	YLR017W
##	2	2	2	2	2	2	2	2
##	YIL155C	YLR207W	YHR193C	YCR010C	YPR062W	YGR256W	YML024W	YGL067W
##	2	2	2	2	2	2	2	2
##	YHR183W	YDR384C	YIR015W	YDR447C	YOL096C	YNL332W	YPL092W	YJR156C
##	2	2	2	2	2	2	2	2
##	YDL244W	YMR114C	YOR176W	YNR002C	YJL094C	YHR100C	YFL058W	YOR251C
##	2	2	2	2	2	2	2	2
##	YGL212W	YGL023C	YBR085W	YJR032W	YKL212W	YLR111W	YDR424C	YPL242C
##	2	2	2	2	2	2	2	2
##	YLR210W	YHL007C	YDR310C	YNL322C	YHR101C	YDR192C	YJL213W	YOR208W
##	2	2	2	2	2	2	2	2
##	YJL035C	YJR118C	YOR194C	YPL018W	YKR010C	YEL031W	YKL073W	YGL217C
##	2	2	2	2	2	2	2	2
##	YJL183W	YFL029C	YGR271W	YMR246W	YFR028C	YGL003C	YOR109W	YGL085W
##	2	2	2	2	2	2	2	2
##	YPL194W	YDR254W	YPR159W	YJL090C	YOR188W	YML124C	YER083C	YER149C
##	2	2	2	2	2	2	2	2
##	YMR307W	YGL240W	YNL250W	YLR189C	YBR289W	YGL251C	YMR129W	YJL099W
##	2	2	2	2	2	2	2	2
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##	2	2	2	2	2	2	2	2
##	YJR064W	YBR175W	YLR321C	YBR225W	YLR262C	YJR006W	YJR144W	YGR233C
##	2	2	2	2	2	2	2	2
##	YLR384C	YDR179C	YDR139C	YDL204W	YKL095W	YDL208W	YDR166C	YJL115W
##	2	2	2	2	2	2	2	2
##	YKL080W	YPR189W	YIR034C	YOR164C	YCL032W	YGR239C	YJR135C	YPL105C
##	2	2	2	2	2	2	2	2
##	YMR159C	YCL055W	YPL002C	YBL016W	YLR190W	YGR058W	YNL161W	YER071C
##	2	2	2	2	2	2	2	2
##	YBR108W	YER062C	YDR233C	YDR261W-A	YPL159C	YLR319C	YPL095C	YLR446W
##	2	2	2	2	2	2	2	2
##	YMR232W	YGR043C	YGR057C	YFL034C-B	YLR354C	YFL010C	YER014W	YLR373C
##	2	2	2	2	2	2	2	2
##	YLR249W	YOR317W	YGL084C	YLR453C	YPL169C	YER060W	YER056C	YGR125W
##	2	2	2	2	2	2	2	2
##	YJR141W	YHL003C	YNR043W	YDR034C	YGR129W	YOR006C	YML079W	YPL090C
##	2	2	2	2	2	2	2	2
##	YBR181C	YNL040W	YDL200C	YIR032C	YKL093W	YDL017W	YDR356W	YBR015C
##	2	2	2	2	2	2	2	2
##	YPR019W	YBR171W	YNL084C	YLR274W	YKL089W	YHR152W	YGR032W	YKL022C
##	2	2	2	2	2	2	2	2
##	YER111C	YER172C	YOR195W	YIL004C	YLR242C	YGL086W	YJL013C	YDR363W
##	2	2	2	2	2	2	2	2
##	YGL163C	YOR058C	YDR149C	YBL056W	YKL045W	YBR125C	YER099C	YDR190C
##	2	2	2	1	1	1	1	1
##	YIL104C	YJR050W	YHR005C	YBR216C	YGR261C	YEL011W	YMR261C	YGR173W
##	1	1	1	1	1	1	1	1
##	YPR104C	YDR342C	YBR195C	YIR005W	YJL042W	YBR010W	YIL071C	YKL122C
##	1	1	1	1	1	1	1	1
##	YIL079C	YKL056C	YKL193C	YDR407C	YLR258W	YOR057W	YBL047C	YOR185C
##	1	1	1	1	1	1	1	1
##	YCL024W	YKR006C	YAR003W	YCL014W	YGR292W	YER162C	YDR412W	YFL006W
##	1	1	1	1	1	1	1	1
##	YPL208W	YJL006C	YPL074W	YGL150C	YFR021W	YBL066C	YKL019W	YLR113W
##	1	1	1	1	1	1	1	1
##	YMR303C	YDL042C	YOR106W	YOR276W	YIL136W	YBR143C	YAL027W	YOR110W
##	1	1	1	1	1	1	1	1
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##	1	1	1	1	1	1	1	1
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##	1	1	1	1	1	1	1	1
##	YDR256C	YDR439W	YHL006C	YNL152W	YOR385W	YFR043C	YNL329C	YHR060W
##	1	1	1	1	1	1	1	1
##	YML031W	YHR121W	YEL043W	YDR142C	YHL018W	YDR013W	YJL039C	YLR019W
##	1	1	1	1	1	1	1	1
##	YGL036W	YDR446W	YJR094C	YDL084W	YPR083W	YJL072C	YHR034C	YKL052C
##	1	1	1	1	1	1	1	1
##	YOR034C	YPL133C	YMR204C	YGL192W	YDR277C	YGR223C	YER141W	YBL006C
##	1	1	1	1	1	1	1	1
##	YBR077C	YGR165W	YKL038W	YNL331C	YPR001W	YGL015C	YNL020C	YNR001C
##	1	1	1	1	1	1	1	1
##	YGR004W	YCR087C-A	YLR049C	YCR014C	YCL040W	YOR102W	YLR211C	YML056C

##	1	1	1	1	1	1	1	1
##	YPL088W	YNR039C	YIL109C	YML023C	YGL166W	YGL053W	YGL119W	YML034W
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##	YFR017C	YGR071C	YDR479C	YJL086C	YPL109C	YCR095C	YGL125W	YDL165W
##	1	1	1	1	1	1	1	1
##	YML037C	YLR142W	YGL254W	YNR068C	YKL043W	YJL019W	YCR076C	YPL149W
##	1	1	1	1	1	1	1	1
##	YLR030W	YOR037W	YGR066C	YDL218W	YDL237W	YBL068W	YDR100W	YOR243C
##	1	1	1	1	1	1	1	1
##	YDR383C	YPL219W	YDL224C	YDR527W	YPL114W	YDR105C	YDR533C	YJL070C
##	1	1	1	1	1	1	1	1
##	YHR156C	YOR247W	YKR099W	YJR110W	YPR106W	YOL052C	YOR232W	YOR115C
##	1	1	1	1	1	1	1	1
##	YBR187W	YBR056W	YJR097W	YKL186C	YGR209C	YPR126C	YJR133W	YHL009C
##	1	1	1	1	1	1	1	1
##	YKL035W	YLR118C	YMR316W	YNL277W	YLR267W	YMR270C	YIR038C	YJL176C
##	1	1	1	1	1	1	1	1
##	YGL189C	YNL054W-B	YER143W	YGR081C	YER151C	YDL044C	YCL063W	YJR048W
##	1	1	1	1	1	1	1	1
##	YNL199C	YML119W	YDR366C	YJR056C	YDR052C	YNL216W	YOR101W	YGR146C
##	1	1	1	1	1	1	1	1
##	YNL280C	YJR159W	YEL062W	YHL021C	YKR094C	YIL148W	YCR020C	YNL320W
##	1	1	1	1	1	1	1	1
##	YDR044W	YHR029C	YLR177W	YOR092W	YBR287W	YOL137W	YHR047C	YER078C
##	1	1	1	1	1	1	1	1
##	YER142C	YBR207W	YNL095C	YML105C	YDR403W	YCR037C	YML060W	YFR006W
##	1	1	1	1	1	1	1	1
##	YLR152C	YOR311C	YNR013C	YLL029W	YDR109C	YER145C	YOR143C	YIL137C
##	1	1	1	1	1	1	1	1
##	YKL106W	YGR070W	YML055W	YMR138W	YNL117W	YHR172W	YLR216C	YJR010C-A
##	1	1	1	1	1	1	1	1
##	YOR182C	YCL027W	YER167W	YML104C	YOR033C	YGR082W	YBR202W	YOL100W
##	1	1	1	1	1	1	1	1
##	YGR006W	YBR050C	YOR254C	YDL028C	YLL043W	YCL061C	YLR085C	YML115C
##	1	1	1	1	1	1	1	1
##	YKL049C	YER114C	YMR149W	YPL065W	YLR206W	YER165W	YOR103C	YMR302C
##	1	1	1	1	1	1	1	1
##	YDL063C	YDL101C	YLL002W	YDR080W	YPL240C	YDR320C	YDL229W	YPL152W
##	1	1	1	1	1	1	1	1
##	YPL218W	YDL049C	YCR048W	YJR040W	YJL002C	YJL054W	YMR104C	YBR188C
##	1	1	1	1	1	1	1	1
##	YNR019W	YMR109W	YMR198W	YCR038C	YGL244W	YNL119W	YLR139C	YML097C
##	1	1	1	1	1	1	1	1
##	YMR106C	YAL020C	YDR323C	YOR085W	YGL116W	YGL124C	YHL027W	YPR135W
##	1	1	1	1	1	1	1	1
##	YGL073W	YBL103C	YDR059C	YKR086W	YOR045W	YMR081C	YAL030W	YCR034W
##	1	1	1	1	1	1	1	1
##	YNR038W	YPR072W	YJL148W	YNL116W	YIR033W	YHR103W	YHR031C	YGR080W
##	1	1	1	1	1	1	1	1
##	YBL051C	YNL121C	YOR157C	YDR469W	YDR022C	YLR192C	YKL189W	YGR196C
##	1	1	1	1	1	1	1	1
##	YHL002W	YOR353C	YNL169C	YDR152W	YDR343C	YGL174W	YDL137W	YNR046W
##	1	1	1	1	1	1	1	1
##	YML065W	YCL028W	YML088W	YLR270W	YOL117W	YLL010C	YDL092W	YDR097C

##	1	1	1	1	1	1	1	1
##	YDR082W	YMR218C	YFR015C	YDR170C	YML077W	YOL093W	YCR030C	YKL028W
##	1	1	1	1	1	1	1	1
##	YDR405W	YGR075C	YBR299W	YEL037C	YFL007W	YDR361C	YNL172W	YML112W
##	1	1	1	1	1	1	1	1
##	YGL060W	YKL082C	YNL242W	YNL210W	YDL090C	YAL036C	YGL158W	YDL095W
##	1	1	1	1	1	1	1	1
##	YFL042C	YDR227W	YJL024C	YBR091C	YGR154C	YKL152C	YEL022W	YPL085W
##	1	1	1	1	1	1	1	1
##	YJL033W	YMR028W	YLL026W	YLR196W	YOL054W	YOL070C	YBR264C	YCR079W
##	1	1	1	1	1	1	1	1
##	YPL140C	YIL113W	YAL059W	YFR011C	YLR399C	YHR016C	YDL159W	YNL023C
##	1	1	1	1	1	1	1	1
##	YHR051W	YHR084W	YCR066W	YDL216C	YDR365C	YPL036W	YOL108C	YNL208W
##	1	1	1	1	1	1	1	1
##	YJR055W	YBL081W	YOR264W	YIL008W	YHR057C	YLR254C	YDR078C	YLR126C
##	1	1	1	1	1	1	1	1
##	YJL184W	YGR122W	YKL197C	YOR159C	YKR088C	YJL151C	YLR440C	YJR125C
##	1	1	1	1	1	1	1	1
##	YOR023C	YJR086W	YML014W	YJL048C	YDR271C	YER106W	YGL170C	YKR100C
##	1	1	1	1	1	1	1	1
##	YER063W	YCR060W	YBR239C	YKL050C	YCL033C	YJL185C	YBR255W	YDL121C
##	1	1	1	1	1	1	1	1
##	YJL068C	YKL142W	YMR233W	YKR034W	YLR239C	YOR028C	YCR005C	YMR163C
##	1	1	1	1	1	1	1	1
##	YAR073W	YOR302W	YKL010C	YBR246W	YPL125W	YGR241C	YDR357C	YLR031W
##	1	1	1	1	1	1	1	1
##	YGR163W	YOR097C	YFR025C	YJR083C	YPL201C	YDR261W-B	YGR170W	YGR161C-C
##	1	1	1	1	1	1	1	1
##	YKR082W	YOR074C	YIL039W	YLR253W	YHR184W	YDR273W	YDR026C	YDR205W
##	1	1	1	1	1	1	1	1
##	YDR252W	YGR189C	YPL023C	YJL153C	YER038C	YLR376C	YJL057C	YGR247W
##	1	1	1	1	1	1	1	1
##	YPR136C	YLR420W	YPR184W	YBL078C	YEL018W	YNL049C	YBR284W	YBR155W
##	1	1	1	1	1	1	1	1
##	YDL013W	YLR072W	YPR172W	YJL180C	YNL273W	YMR280C	YOR318C	YMR030W
##	1	1	1	1	1	1	1	1
##	YCL056C	YOR330C	YEL048C	YOL131W	YLR451W	YPR148C	YLR263W	YBL010C
##	1	1	1	1	1	1	1	1
##	YJR134C	YNL105W	YMR154C	YOR359W	YDR203W	YOR324C	YDR455C	YDL118W
##	1	1	1	1	1	1	1	1
##	YMR133W	YIL122W	YPL233W	YIL007C	YLR185W	YDR500C	YKL023W	YEL013W
##	1	1	1	1	1	1	1	1
##	YOL129W	YLR026C	YAL028W	YDR504C	YDL154W	YLR156W	YLR223C	YNR050C
##	1	1	1	1	1	1	1	1
##	YDR214W	YKL076C	YOR124C	YKL075C	YKL181W	YHR143W-A	YDL088C	YMR067C
##	1	1	1	1	1	1	1	1
##	YBR212W	YOR281C	YFR007W	YDR529C	YPL138C	YGR110W	YLR005W	YDR005C
##	1	1	1	1	1	1	1	1
##	YGL145W	YER128W	YGL225W	YLR112W	YDR194C	YGR185C	YHR130C	YLR303W
##	1	1	1	1	1	1	1	1
##	YDL217C	YHR180W	YDR541C	YLR059C	YER039C	YER180C	YOR289W	YNR048W
##	1	1	1	1	1	1	1	1
##	YAL060W	YNR051C	YBR223C	YOR220W	YIL092W	YDR008C	YNL042W	YLL032C

```

##      1      1      1      1      1      1      1      1
## YMR273C YKL044W YOL050C YKL107W YDR423C YOR112W YHR177W YJR011C
##      1      1      1      1      1      1      1      1
## YHR014W YML127W YPR118W YNL249C YLR056W YDR297W YGR060W YGR007W
##      1      1      1      1      1      1      1      1
## YJL125C YOL008W YDR171W YHR144C YFL060C YKL157W YNL045W YGL017W
##      1      1      1      1      1      1      1      1
## YOR005C YGR202C YHR201C YML005W YHR070W YMR013C YJL198W YPR163C
##      1      1      1      1      1      1      1      1
## YOR008C YDR160W YML062C YLR335W YIL095W YKR042W YMR039C YAL013W
##      1      1      1      1      1      1      1      1
## YAL024C YIL009W YDR085C YMR168C YLR238W YHR115C YDR027C YDR200C
##      1      1      1      1      1      1      1      1
## YPR133W-A YPR111W YDR146C YBL085W YBL023C YEL032W YLR045C YKL139W
##      1      1      1      1      1      1      1      1
## YGL038C YHR079C YLR116W YIR031C YLR195C YGL097W YNL299W YHR154W
##      1      1      1      1      1      1      1      1
## YLR306W YBR021W YDR164C YNL209W YKL196C YIL153W YCR067C YJL174W
##      1      1      1      1      1      1      1      1
## YOR297C YKL126W YGL226C-A YDR177W YMR022W YER015W YBR080C YBL050W
##      1      1      1      1      1      1      1      1
## YOR257W YNL102W YBR097W YDR495C YGL095C YPL155C YHR202W YPL209C
##      1      1      1      1      1      1      1      1
## YGR238C YNL031C YGR116W YBL082C YHR134W YIL030C YNL006W YKL176C
##      1      1      1      1      1      1      1      1
## YMR284W YGL027C YGR098C YBL069W YHR010W YPR116W YDR369C YDR217C
##      1      1      1      1      1      1      1      1
## YBR215W YOL068C YOR025W YMR224C YNL171C YOR160W YAL026C YLR425W
##      1      1      1      1      1      1      1      1
## YNL289W YMR299C YOR153W YKR047W YIL159W YDL117W YLR381W YJR053W
##      1      1      1      1      1      1      1      1
## YDR289C YBR095C YBR107C YNL170W YHR191C YBR231C YNL215W YNL307C
##      1      1      1      1      1      1      1      1
## YML016C YCL016C YJR143C YOR321W YKL092C YLR372W YOR027W YER068W
##      1      1      1      1      1      1      1      1
## YER122C YKL020C YDR351W YLR433C YKL190W YLL050C YLR235C YNL098C
##      1      1      1      1      1      1      1      1
## YMR060C
##      1

```

#el valor máximo de degree es 118, es decir que, el nodo correspondiente a YPR110C posee 118 conexiones

diameter(yeast) #la función diameter permite saber el máximo camino entre dos nodos, o sea, el diámetro

e. Calcule el diámetro

```
## [1] 15
```

```
trayectoria<-(as.vector(distance_table(yeast)))
trayectoria
```

f. La trayectoria más larga.

```
## $res
## [1] 11855 67910 276506 670068 786151 550965 274661 114390 43508 16152
## [11] 5473 1378 306 56 16
##
## $unconnected
## [1] 603641
```

```
sort(trayectoria$res, decreasing = TRUE)
```

```
## [1] 786151 670068 550965 276506 274661 114390 67910 43508 16152 11855
## [11] 5473 1378 306 56 16
```

#la trayectoria más larga es 786,151.

g. Elimine los 10 nodos más conectados de la red y determine el diámetro cada vez que lo haga.

usaré un objeto de un chunk pasado, que tiene los degrees en orden decreciente para saber cuáles son
degreemax

```
## YPR110C YPL131W YNL178W YIL021W YOL127W YJL063C YBR283C YLR378C
## 118 115 114 113 113 108 108 108
## YMR260C YBR251W YGL123W YNL284C YGL103W YOL040C YGR034W YDL191W
## 107 106 106 106 106 104 104 104
## YDL136W YGR220C YNR037C YOR063W YIL018W YLR344W YEL050C YPL183W-A
## 104 104 104 104 104 104 104 102
## YDR041W YJR113C YML010W YBL038W YLR075W YGL068W YHL015W YNL189W
## 101 97 95 94 93 91 90 90
## YJR123W YBL004W YDL014W YLR175W YBL092W YNL132W YDR101C YNR016C
## 86 73 68 62 62 60 58 58
## YIL147C YPR010C YJL109C YER016W YBR257W YMR290C YDL029W YER006W
## 58 57 57 57 57 56 56 55
## YDR496C YGR103W YBR084C-A YBL027W YKL009W YHR203C YJR145C YHR052W
## 55 55 55 55 54 54 54 53
## YPR016C YGR090W YBR146W YDR237W YNL271C YOR116C YPL093W YPR187W
## 53 53 53 53 53 52 52 52
## YOR207C YMR310C YGR283C YNL002C YPL012W YMR049C YNL306W YOR341W
## 52 52 52 51 51 50 50 49
## YGL059W YIL042C YML025C YOL077C YOR272W YGL205W YGL211W YBR234C
## 48 48 47 46 46 46 45 45
## YDR116C YNL061W YHR147C YDL140C YPL043W YGR145W YMR158W YDL061C
## 44 44 44 43 43 43 43 43
## YPR166C YLR388W YDR036C YGL147C YNL067W YLR367W YJL190C YGR085C
```

##	43	43	42	42	42	42	42	42
##	YPR102C	YBR048W	YKL173W	YMR188C	YOR151C	YMR125W	YDR025W	YLR197W
##	42	42	42	41	41	41	41	40
##	YML026C	YKL170W	YOR206W	YDR450W	YDR012W	YNL177C	YJL177W	YKL180W
##	40	40	40	40	40	40	40	40
##	YBR031W	YER117W	YBL087C	YDR127W	YBR208C	YNL081C	YCR031C	YJL191W
##	40	40	40	39	39	39	39	39
##	YHR197W	YPL126W	YKR081C	YOR150W	YIL133C	YDR394W	YLR340W	YNL069C
##	38	38	38	38	38	37	37	37
##	YKL113C	YLR409C	YDL185W	YKL145W	YDR449C	YPL231W	YMR143W	YDL083C
##	37	36	36	36	36	36	36	36
##	YPL212C	YKL104C	YEL054C	YDR418W	YPL220W	YGL135W	YHR148W	YNL292W
##	36	35	35	35	35	35	35	35
##	YGR118W	YNL185C	YLL008W	YNR036C	YPR132W	YDL202W	YKL192C	YML049C
##	35	35	34	34	34	34	34	34
##	YFL001W	YGL063W	YDR117C	YBR247C	YDR337W	YER029C	YBR154C	YLR423C
##	34	34	34	34	33	33	32	32
##	YOR210W	YER082C	YDR324C	YER126C	YML009C	YNL244C	YPL227C	YNL110C
##	32	32	32	32	32	32	32	32
##	YHL004W	YKL014C	YDL031W	YKR060W	YPL211W	YCL059C	YKL024C	YDR226W
##	32	31	31	31	31	31	31	31
##	YER170W	YLR244C	YBL091C	YMR208W	YGR162W	YKL182W	YLR147C	YDL227C
##	31	31	31	31	30	30	30	30
##	YGL111W	YJR014W	YHL030W	YGL120C	YJR002W	YML054C	YJR008W	YPR183W
##	29	29	28	28	28	28	28	28
##	YDR162C	YMR314W	YLR129W	YNL236W	YER061C	YNL123W	YBR041W	YHR088W
##	28	27	27	27	27	27	27	27
##	YOL041C	YLL036C	YGR245C	YOR180C	YAL035W	YHR041C	YMR093W	YNL137C
##	26	26	26	26	26	26	26	26
##	YOR093C	YBR222C	YMR012W	YMR128W	YLR284C	YDR060W	YHR009C	YJR016C
##	26	26	25	25	25	25	25	25
##	YLR275W	YGL049C	YGR158C	YGL019W	YHR200W	YGR095C	YGR195W	YOL021C
##	25	24	24	24	24	24	24	24
##	YCR057C	YER012W	YBL013W	YBR029C	YDR283C	YPR033C	YIL035C	YMR190C
##	24	24	24	24	24	24	24	24
##	YOR061W	YBR193C	YER022W	YKL172W	YOR174W	YGL245W	YGR240C	YLR186W
##	23	23	23	23	23	23	23	23
##	YML064C	YNL256W	YPL151C	YOL135C	YOL051W	YLR071C	YFR052W	YLR222C
##	23	23	23	23	23	23	22	22
##	YFR004W	YKL067W	YER069W	YJR109C	YIL061C	YLR002C	YPL217C	YDR427W
##	22	22	22	22	22	22	22	22
##	YJR091C	YPL028W	YIL160C	YPR144C	YMR288W	YGR104C	YDL148C	YML007W
##	22	22	22	22	22	22	22	22
##	YEL061C	YER090W	YER021W	YOR261C	YOR117W	YDR087C	YBR055C	YIL116W
##	22	21	21	21	21	21	21	21
##	YLR117C	YDR299W	YMR112C	YDL030W	YLR449W	YNL182C	YOR335C	YDR148C
##	21	21	21	21	21	21	21	21
##	YOL120C	YGL151W	YNL301C	YCR081W	YPR070W	YNR010W	YPR178W	YDR272W
##	21	21	21	21	21	21	21	21
##	YHR058C	YOR040W	YDR443C	YJR057W	YML004C	YDR280W	YER081W	YCL030C
##	21	21	21	21	21	20	20	20
##	YDL007W	YDL111C	YHR069C	YOR259C	YPR108W	YJR007W	YOR001W	YPR168W
##	20	20	20	20	20	20	20	20
##	YIL093C	YHR114W	YNL088W	YNR033W	YER133W	YPR067W	YLL027W	YNL005C

##	20	20	20	20	20	20	20	20
##	YHR208W	YIL154C	YOL142W	YDR292C	YJR148W	YCL054W	YOR039W	YDL097C
##	20	20	20	20	20	20	19	19
##	YGR013W	YDR240C	YPR190C	YOR145C	YKL060C	YKL012W	YDL087C	YPL213W
##	19	19	19	19	19	19	19	19
##	YKL216W	YPL252C	YPL042C	YGL025C	YGR128C	YOR326W	YBR221C	YIL125W
##	19	19	19	19	19	18	18	18
##	YLR447C	YDL147W	YBR160W	YPL266W	YKL144C	YKR002W	YFL002C	YER155C
##	18	18	18	18	18	18	18	18
##	YMR024W	YMR262W	YBL055C	YAL054C	YBR115C	YNL168C	YHR206W	YFL033C
##	18	18	18	18	18	18	18	18
##	YLR006C	YJR017C	YNL113W	YGR091W	YMR047C	YER052C	YNL075W	YLL011W
##	18	18	17	17	17	17	17	17
##	YJL130C	YLR424W	YDR454C	YOL023W	YNL026W	YMR300C	YER110C	YJR070C
##	17	17	17	17	17	17	17	17
##	YJL020C	YLR276C	YGL048C	YMR061W	YJL203W	YER178W	YNL071W	YGL112C
##	17	17	17	16	16	16	16	16
##	YFL018C	YCL017C	YJR093C	YLR355C	YLR153C	YDR308C	YDR416W	YML022W
##	16	16	16	16	16	16	16	16
##	YDL051W	YBL026W	YCL009C	YLR106C	YHR026W	YDR064W	YLR231C	YPL234C
##	16	16	16	16	16	16	16	16
##	YGR214W	YLR048W	YPL214C	YHR189W	YJL218W	YNR053C	YDR235W	YEL021W
##	16	16	16	16	16	16	16	16
##	YPL148C	YPR113W	YDR441C	YGR193C	YOR221C	YGR194C	YGL026C	YFR001W
##	16	16	16	16	16	16	15	15
##	YLR347C	YJL138C	YNR003C	YGL011C	YGR263C	YHR018C	YBR253W	YDR140W
##	15	15	15	15	15	15	15	15
##	YHR030C	YER127W	YDL239C	YDR007W	YLR115W	YAL043C	YEL027W	Q0130
##	15	15	15	15	15	15	15	15
##	YPL017C	YOL066C	YNR074C	YHL016C	YPL091W	YLR180W	YNL072W	YML094W
##	15	15	15	15	15	15	15	15
##	YER050C	YLR058C	YBR088C	YDR428C	YDL142C	YDL209C	YOL060C	YLR277C
##	15	15	15	15	15	15	15	15
##	YOR224C	YOR260W	YER094C	YDR301W	YDR211W	YOR362C	YBR142W	YLR421C
##	15	14	14	14	14	14	14	14
##	YKL003C	YLL041C	YOR111W	YNL063W	YKL018W	YNL317W	YGR156W	Q0045
##	14	14	14	14	14	14	14	14
##	Q0250	YKL059C	YOR308C	YML046W	YEL058W	YBR119W	YDL238C	YBR281C
##	14	14	14	14	14	14	14	14
##	YMR278W	YLR298C	YMR240C	YJR069C	YPR043W	YKR038C	YDL104C	YBR263W
##	14	14	14	14	14	14	14	14
##	YJR137C	YIL094C	YHR062C	YDR129C	YJL069C	YKR048C	YBR248C	YOR332W
##	14	14	14	14	14	14	14	13
##	YLR291C	YOR310C	YDR448W	YDR158W	YBR127C	YDR195W	YGR135W	YCR035C
##	13	13	13	13	13	13	13	13
##	YML092C	YBR081C	YBR218C	YCR046C	YLR029C	YHR066W	YFR044C	YHR170W
##	13	13	13	13	13	13	13	13
##	YPL013C	YLR200W	YKL099C	YHR086W	YDR502C	YPR103W	YHR111W	YHR038W
##	13	13	13	13	13	13	13	13
##	YBR189W	YPL081W	YPR060C	YKR001C	YOR285W	YNR058W	Q0275	YNL232W
##	13	13	13	13	13	13	13	13
##	YPR107C	YCR003W	YOR274W	YGR244C	YGR021W	YJL121C	YGR084C	YDR347W
##	13	13	13	13	13	13	13	13
##	YDR404C	YPL118W	YGL236C	YKL155C	YOR131C	YGL129C	YNL073W	YMR121C

##	13	13	13	13	13	13	13	13
##	YPL069C	YDR037W	YNL220W	YJL172W	YLR009W	YGL105W	YOL149W	YMR309C
##	13	13	13	13	13	13	12	12
##	YDR298C	YJR121W	YAL032C	YGR020C	YOL038W	YFR037C	YGL195W	YJL005W
##	12	12	12	12	12	12	12	12
##	YGR232W	YGR267C	YER002W	YIL033C	YOL139C	YBR039W	YDL004W	YBL099W
##	12	12	12	12	12	12	12	12
##	YPR024W	YLR289W	YGL030W	YDR322W	YOR076C	YLR022C	YDR018C	YIR042C
##	12	12	12	12	12	12	12	12
##	YDL043C	YNL222W	YKR009C	YPR073C	YBR003W	YJL167W	YER171W	YCL004W
##	12	12	12	12	12	12	12	12
##	YJL046W	YDR364C	YGR252W	YEL051W	YHR020W	YBR042C	YDR328C	YLR208W
##	12	12	12	12	12	12	11	11
##	YDL160C	YDL116W	YDL060W	YDR388W	YPL135W	YJL088W	YOR142W	YGL009C
##	11	11	11	11	11	11	11	11
##	YMR239C	YBL041W	YNL262W	YGR218W	YOL004W	YCR053W	YBR200W	YMR229C
##	11	11	11	11	11	11	11	11
##	YDL100C	YDL226C	YEL015W	YCR028C-A	YER017C	YHR025W	YDL168W	YDR236C
##	11	11	11	11	11	11	11	11
##	YJR047C	YMR294W	YIR027C	YDL052C	YGR278W	YLR439W	YMR178W	YKL184W
##	11	11	11	11	11	11	11	11
##	YGR112W	YNL218W	YLR143W	YKR031C	YOL005C	YMR089C	YEL034W	YDR175C
##	11	11	11	11	11	11	11	11
##	YDL213C	YOR226C	YOR286W	YCR077C	YKR068C	YGL137W	YPL111W	YCR012W
##	11	11	11	10	10	10	10	10
##	YDL047W	YKR025W	YJR063W	YIL078W	YKL143W	YJL001W	YLR438W	YGL207W
##	10	10	10	10	10	10	10	10
##	YHR196W	YOR202W	YPL198W	YOR047C	YMR286W	YGL076C	Q0085	YPR004C
##	10	10	10	10	10	10	10	10
##	YBL080C	YBR002C	YMR101C	YDL193W	YER095W	YOR065W	YBR198C	YHR129C
##	10	10	10	10	10	10	10	10
##	YOR196C	YOR236W	YGL037C	YMR074C	YGR207C	YPL082C	YOR241W	YDL150W
##	10	10	10	10	10	10	10	10
##	YMR113W	YOL121C	YJR024C	YGL062W	YGR274C	YJL189W	YGL018C	YPR101W
##	10	10	10	10	10	10	10	10
##	YKL194C	YKL151C	YJR117W	YPL178W	YCR072C	YMR242C	YOR312C	YML015C
##	10	10	10	10	10	10	10	10
##	YGR074W	YHR106W	YGL169W	YDR076W	YJR139C	YDR353W	YER057C	YPL008W
##	10	10	10	10	10	10	10	10
##	YKL132C	YEL024W	YIL051C	YBR288C	YAL040C	YMR236W	YPL237W	YNL248C
##	10	10	10	10	10	10	10	10
##	YGR253C	YOL143C	YNL302C	YDR473C	YER112W	YLR166C	YMR205C	YPR167C
##	10	10	10	9	9	9	9	9
##	YGL190C	YDL145C	YOR136W	YKR069W	YNL104C	YBR009C	YGL171W	YPR191W
##	9	9	9	9	9	9	9	9
##	YGR155W	YDR167W	YAL033W	YLR288C	YDR311W	YBR025C	YDR074W	YBL007C
##	9	9	9	9	9	9	9	9
##	YGL127C	YMR118C	YKL141W	YOR128C	YGR180C	YCR036W	YGL143C	YIL103W
##	9	9	9	9	9	9	9	9
##	YOR278W	YDL045C	YIR022W	YDL182W	YLR406C	YML110C	YER074W	YIL069C
##	9	9	9	9	9	9	9	9
##	YKL211C	YLR328W	YDL075W	YDR145W	YDR196C	YGL128C	YMR287C	YDR462W
##	9	9	9	9	9	9	9	9
##	YGL091C	YLR281C	YLR359W	YBR019C	YOL114C	YMR315W	YNL151C	YIL003W

##	9	9	9	9	9	9	9	9
##	YKL191W	YML051W	YDR293C	YBR196C	YBL105C	YDR054C	YOL140W	YMR193W
##	9	9	9	9	9	9	9	8
##	YHR107C	YOL058W	YNL287W	YDL188C	YKR026C	YGL234W	YPL139C	YJR042W
##	8	8	8	8	8	8	8	8
##	YGR186W	YPL204W	YOL086C	YGR204W	YNL085W	YBR103W	YLL018C	YFL045C
##	8	8	8	8	8	8	8	8
##	YOR167C	YBR153W	YGR010W	YDR242W	Q0105	YGL221C	YHR168W	YBR176W
##	8	8	8	8	8	8	8	8
##	YAR015W	YNL162W	YHR141C	YHL032C	YOR108W	YBR270C	YGR019W	YML106W
##	8	8	8	8	8	8	8	8
##	YER157W	YMR271C	YDL055C	YNL241C	YML059C	YDL205C	YGR113W	YFR050C
##	8	8	8	8	8	8	8	8
##	YKR087C	YER087W	YDR004W	YCR019W	YJR105W	YER179W	YOR209C	YPR035W
##	8	8	8	8	8	8	8	8
##	YBR084W	YDR539W	YJL092W	YMR084W	YDL131W	YOR168W	YOL033W	YKL156W
##	8	8	8	8	8	8	8	8
##	YOR122C	YBR245C	YDR432W	YLR074C	YGR120C	YMR293C	YHR021C	YOL148C
##	8	8	8	8	8	8	8	8
##	YMR146C	YJL124C	YJL098W	YNL147W	YFR040W	YNL118C	YFL022C	YNR012W
##	7	7	7	7	7	7	7	7
##	YCL010C	YAL044C	YBL033C	YGR083C	YER025W	YFR051C	YGR262C	YDR378C
##	7	7	7	7	7	7	7	7
##	YIL076W	YOR184W	YGL070C	YJR111C	YFL038C	YDL134C	YBR272C	YDL132W
##	7	7	7	7	7	7	7	7
##	YNL112W	YLR212C	YOL006C	YIL126W	YOR323C	YJR068W	YMR217W	YDR510W
##	7	7	7	7	7	7	7	7
##	YDR115W	YDR259C	YMR267W	YPL124W	YIL020C	YPR088C	YLR295C	YMR153W
##	7	7	7	7	7	7	7	7
##	YMR150C	YER055C	YAL038W	YER154W	YLR264W	YDR086C	YPR074C	YBR117C
##	7	7	7	7	7	7	7	7
##	YDR050C	YNL092W	YGR231C	YPR082C	YGL148W	YKL040C	YLR342W	YER168C
##	7	7	7	7	7	7	7	7
##	YGR132C	YPR086W	YGR276C	YML021C	YHR046C	YOR014W	YIL084C	YDR287W
##	7	7	7	7	7	7	7	7
##	YOL071W	YPL160W	YGR012W	YFL030W	YMR090W	YJR149W	YER004W	YLR107W
##	7	7	7	7	7	7	7	7
##	YBR166C	YDR341C	YIL074C	YGL094C	YOL126C	YOL080C	YJR060W	YFL005W
##	7	7	7	7	7	7	7	7
##	YCL029C	YKR054C	YFL039C	YKR028W	YGL044C	YOL082W	YDR238C	YGR061C
##	7	7	7	7	7	7	7	7
##	YOR158W	YJL187C	YMR035W	YOR347C	YHR091C	YOR095C	YBL019W	YML085C
##	7	7	7	7	7	7	7	7
##	YIL106W	YIL062C	YGL220W	YLR370C	YKL057C	YGL122C	YDR228C	YDL225W
##	6	6	6	6	6	6	6	6
##	YFR030W	YDR354W	YJL026W	YJL014W	YBR256C	YOR270C	YNR035C	YAL016W
##	6	6	6	6	6	6	6	6
##	YJR065C	YBR079C	YOR304W	YCR093W	YKL013C	YBL002W	YKL001C	YMR213W
##	6	6	6	6	6	6	6	6
##	YDR385W	YMR116C	YPR137W	YGL099W	YPL254W	YKR067W	YMR172W	YMR268C
##	6	6	6	6	6	6	6	6
##	YHR059W	YBL039C	YGL092W	YNL016W	YMR223W	YPR047W	YLR245C	YLR060W
##	6	6	6	6	6	6	6	6
##	YFL059W	YCL018W	YOR303W	YML125C	YDR487C	YDR408C	YMR054W	YGR144W

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##	6	6	6	6	6	6	6	6
##	YDL112W	YOR201C	YLR167W	YPL070W	YOR133W	YGL133W	YPL011C	YGR005C
##	6	6	6	6	6	6	6	6
##	YDR336W	YMR023C	YKR072C	YJL140W	YMR263W	YGR175C	YAL062W	YDL201W
##	6	6	6	6	6	6	6	6
##	YGR169C	YDL174C	YDL178W	YEL071W	YBL061C	YLR011W	YDL036C	YLR382C
##	6	6	6	6	6	6	6	6
##	YOL095C	YLR308W	YDL078C	YDL141W	YLR165C	YLR307W	YBR023C	YGL252C
##	6	6	6	6	6	6	6	6
##	YBR011C	YKL085W	YJL095W	YEL003W	YGR092W	YOR290C	YDL102W	YNL079C
##	6	6	6	6	6	6	6	6
##	YGR078C	YNL153C	YPL235W	YER070W	YKL081W	YIL034C	YHR019C	YOR089C
##	6	6	6	6	6	6	6	6
##	YPL172C	YGR101W	YGR255C	YBL098W	YML086C	YLL057C	YDL143W	YPR029C
##	6	6	6	6	6	6	6	5
##	YGL115W	YOL094C	YBL045C	YBR126C	YGL237C	YBR135W	YIR001C	YKL103C
##	5	5	5	5	5	5	5	5
##	YIL142W	YLR025W	YNL330C	YGL156W	YPL181W	YMR199W	YER177W	YMR120C
##	5	5	5	5	5	5	5	5
##	YPL256C	YIL128W	YGL197W	YMR308C	YHR024C	YBR060C	YDR381W	YGR234W
##	5	5	5	5	5	5	5	5
##	YOR181W	YGR161C	YGR200C	YLR310C	YDR300C	YDL098C	YIL070C	YOR035C
##	5	5	5	5	5	5	5	5
##	YPL258C	YML069W	YJR104C	YGL198W	YCR086W	YJR049C	YNL200C	YGL153W
##	5	5	5	5	5	5	5	5
##	YIL066C	YJL093C	YDR429C	YNR057C	YDR062W	YNL086W	YPR026W	YDL089W
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##	YDR264C	YGR148C	YLR028C	YDL203C	YGR134W	YJR010W	YBL076C	YKL150W
##	5	5	5	5	5	5	5	5
##	YBR252W	YIL043C	YBR018C	YBR213W	YLR357W	YAL046C	YPL059W	YDR296W
##	5	5	5	5	5	5	5	5
##	YNL316C	YEL070W	YOL059W	YPL010W	YNL288W	YPL132W	YLR386W	YHR210C
##	5	5	5	5	5	5	5	5
##	YNR073C	YER037W	YDL022W	YKL002W	YMR130W	YFR009W	YDL081C	YNR071C
##	5	5	5	5	5	5	5	5
##	YMR009W	YNL030W	YDR147W	YBR094W	YDR268W	YDR111C	YGR094W	YPL246C
##	5	5	5	5	5	5	5	5
##	YOL097C	YJL060W	YEL038W	YPL279C	YOR390W	YNL037C	YLR089C	YGL224C
##	5	5	5	5	5	5	5	5
##	YOR375C	YPL206C	YHR032W	YBR053C	YPL110C	YDR338C	YHR128W	YER183C
##	5	5	5	5	5	5	5	5
##	YLR163C	YGL154C	YKR059W	YPL016W	YAL041W	YER125W	YDR389W	YOR265W
##	5	5	5	5	5	5	5	5
##	YFL037W	YHR118C	YOR098C	YLR234W	YDR212W	YER173W	YPL269W	YHR158C
##	5	5	5	5	5	5	5	5
##	YER107C	YJL061W	YGL106W	YNR052C	YHR099W	YGL100W	YBR249C	YDL153C
##	5	5	5	5	5	5	5	5
##	YLR337C	YDR023W	YEL041W	YDR489W	YDR232W	YMR296C	YKR037C	YOR356W
##	5	5	5	5	5	5	5	5
##	YML087C	YOL145C	YOL064C	YLR133W	YGR062C	YNL243W	YDL207W	YBR087W
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##	YFL024C	YJR022W	YPR023C	YJL080C	YKL218C	YJR043C	YML109W	YHR169W
##	4	4	4	4	4	4	4	4
##	YIR002C	YDL108W	YNL138W	YPL086C	YDR386W	YBR109C	YBL003C	YDR071C
##	4	4	4	4	4	4	4	4
##	YOR269W	YGL061C	YJL045W	YJR051W	YKL148C	YPL255W	YBR072W	YDR174W
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##	YBR217W	YGR136W	YJR102C	YDR488C	YNL022C	YDR270W	YGL040C	YBR227C
##	4	4	4	4	4	4	4	4
##	YBR295W	YML126C	YIL145C	YGR119C	YDL065C	YOR119C	YDR047W	YCR009C
##	4	4	4	4	4	4	4	4
##	YHR042W	YER091C	YOR327C	YPR048W	YNL251C	YBR061C	YMR048W	YLR035C
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##	YGL136C	YDR009W	YLR324W	YDR538W	YGL181W	YNL082W	YCL037C	YDL236W
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##	YDL171C	YPL022W	YDL130W	YNL036W	YPL188W	YPL190C	YMR250W	YPL164C
##	4	4	4	4	4	4	4	4
##	YDR294C	YBR020W	YNL129W	YER043C	YMR186W	YGR192C	YFR036W	YDR019C
##	4	4	4	4	4	4	4	4
##	YFR047C	YOR004W	YOR137C	YHR028C	YOL043C	YKR080W	YMR177W	YHR012W
##	4	4	4	4	4	4	4	4
##	YHL022C	YOR171C	YBR243C	YLR361C	YDR339C	YML075C	YHR179W	YAL015C
##	4	4	4	4	4	4	4	4
##	YKR079C	YCR024C	YNL011C	YOL123W	YGL213C	YHR089C	YBL079W	YKL079W
##	4	4	4	4	4	4	4	4
##	YGR208W	YIR006C	YJL194W	YGL206C	YPR141C	YGL216W	YOL115W	YER105C
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##	YOR217W	YDR028C	YML063W	YPR112C	YOR227W	YPL161C	YMR094W	YPR121W
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##	4	4	4	4	4	4	4	4
##	YPL171C	YPL040C	YOR026W	YMR167W	YML117W	YHL001W	YKL006W	YBR038W
##	4	4	4	4	4	4	4	4
##	YLR259C	YGR121C	YMR055C	YHR011W	YOR219C	YLR441C	YKL029C	YNL305C
##	4	4	4	4	4	4	4	4
##	YPL224C	YDL219W	YMR234W	YGL178W	YGL173C	YPL084W	YLR330W	YDR150W
##	4	4	4	4	4	4	4	4
##	YER027C	YPL203W	YGL208W	YNL099C	YML098W	YGR264C	YDR091C	YHR102W
##	3	3	3	3	3	3	3	3
##	YBR260C	YDL126C	YHR216W	YER026C	YOR250C	YBR059C	YER086W	YAL029C
##	3	3	3	3	3	3	3	3
##	YDL006W	YDL192W	YNL333W	YPL049C	YNL261W	YKR014C	YGL022W	YOR043W
##	3	3	3	3	3	3	3	3
##	YNL124W	YEL002C	YJR101W	YDL220C	YOR340C	YNL290W	YER031C	YMR105C
##	3	3	3	3	3	3	3	3
##	YNL154C	YPL001W	YDR472W	YBL058W	YBR282W	YDR507C	YMR139W	YMR108W
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##	YHR174W	YER003C	YML091C	YLR293C	YLR127C	YMR095C	YAL023C	YER092W

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##	YHR085W	YDL195W	YIL063C	YLR371W	YNL139C	YML032C	YHR023W	YBL090W
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##	YOR144C	YNL135C	YGR040W	YPL153C	YER008C	YLR398C	YDR480W	YMR025W
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##	YJR090C	YIL046W	YGR268C	YFL023W	YOR036W	YDR084C	YGR171C	YNL258C
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##	YLL049W	YKL130C	YHR163W	YOR284W	YGR248W	YCR073W-A	YNR034W	YDR376W
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##	YLR052W	YLR417W	YJL199C	YDR016C	YOL069W	YER042W	YLR377C	YDR201W
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##	YCR088W	YGR009C	YHR142W	YPL241C	YBR082C	YNL233W	YDR245W	YKL068W
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##	YGR229C	YGR140W	YKL048C	YFR019W	YER007W	YJR075W	YEL029C	YNL126W
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##	YIL002C	YLR305C	YML103C	YKL135C	YDR477W	YOR358W	YGR250C	YOL061W
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##	YHR135C	YJR132W	YMR091C	YLR044C	YHR064C	YDL002C	YMR096W	YBR098W
##	3	3	3	3	3	3	3	3
##	YGR178C	YJL052W	YPR040W	YJR009C	YIL075C	YJL058C	YLR135W	YMR038C
##	3	3	3	3	3	3	3	3
##	YGL172W	YNL047C	YNR041C	YMR001C	YPR175W	YPR041W	YBR037C	YGL043W
##	3	3	3	3	3	3	3	3
##	YGR124W	YAR008W	YJL129C	YDR035W	YIL162W	YKL094W	YOR216C	YAR019C
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##	3	3	3	3	3	3	3	3
##	YNL106C	YML095C-A	YKL166C	YDR460W	YPL259C	YBL046W	YIL112W	YLR015W
##	3	3	2	2	2	2	2	2
##	YHL019C	YNL056W	YGR086C	YFR049W	YIL050W	YBL021C	YER059W	YMR189W
##	2	2	2	2	2	2	2	2
##	YPR066W	YGR048W	YLR170C	YJL164C	YNR006W	YML100W	YJL074C	YBR130C

##	2	2	2	2	2	2	2	2
##	YLR432W	YCR033W	YNL201C	YOR056C	YEL056W	YML102W	YDR188W	YDR001C
##	2	2	2	2	2	2	2	2
##	YER146W	YPR054W	YPL004C	YAL003W	YOL090W	YDL003W	YPL195W	YJL173C
##	2	2	2	2	2	2	2	2
##	YBR254C	YKR085C	YLR352W	YER093C	YPR182W	YDR225W	YOR368W	YOR204W
##	2	2	2	2	2	2	2	2
##	YAL012W	YGR150C	YOR329C	YOL010W	YBR136W	YGL130W	YHR119W	YEL055C
##	2	2	2	2	2	2	2	2
##	YLL034C	YLR229C	YDR130C	YDL175C	YGR270W	YNL311C	YBR017C	YHL011C
##	2	2	2	2	2	2	2	2
##	YDR049W	YNL312W	YAR002W	YAL025C	YGL187C	YPL009C	YGL008C	YIL068C
##	2	2	2	2	2	2	2	2
##	YDL167C	YPR105C	YDL161W	YJL036W	YPR046W	YER144C	YIL105C	YOR155C
##	2	2	2	2	2	2	2	2
##	YCR082W	YOR212W	YOR020C	YEL005C	YKL008C	YDL139C	YGL134W	YHR113W
##	2	2	2	2	2	2	2	2
##	YNR007C	YMR124W	YBR228W	YIR016W	YNL259C	YEL066W	YDR453C	YCL020W
##	2	2	2	2	2	2	2	2
##	YLR287C	YHR185C	YHR044C	YHR043C	YDR520C	YPR193C	YOR275C	YKR007W
##	2	2	2	2	2	2	2	2
##	YDR229W	YML008C	YPL077C	YCL019W	YLR345W	YLR362W	YIL132C	YML057W
##	2	2	2	2	2	2	2	2
##	YKL061W	YMR068W	YHR171W	YLR125W	YLR182W	YOR059C	YNL263C	YKR022C
##	2	2	2	2	2	2	2	2
##	YGR285C	YHR176W	YDR113C	YGR024C	YDR318W	YFR008W	YER118C	YIL144W
##	2	2	2	2	2	2	2	2
##	YDR189W	YFR013W	YFL003C	YBL102W	YIL052C	YOL018C	YBR267W	YGL186C
##	2	2	2	2	2	2	2	2
##	YER023W	YER148W	YPR003C	YBR065C	YDR121W	YLR092W	YML042W	YGL250W
##	2	2	2	2	2	2	2	2
##	YER056C-A	YDR382W	YML101C	YPL189W	YDR045C	YOL039W	YNR032W	YJR077C
##	2	2	2	2	2	2	2	2
##	YHR074W	YBR294W	YFR002W	YMR298W	YDR505C	YER060W-A	YDL164C	YLR017W
##	2	2	2	2	2	2	2	2
##	YIL155C	YLR207W	YHR193C	YCR010C	YPR062W	YGR256W	YML024W	YGL067W
##	2	2	2	2	2	2	2	2
##	YHR183W	YDR384C	YIR015W	YDR447C	YOL096C	YNL332W	YPL092W	YJR156C
##	2	2	2	2	2	2	2	2
##	YDL244W	YMR114C	YOR176W	YNR002C	YJL094C	YHR100C	YFL058W	YOR251C
##	2	2	2	2	2	2	2	2
##	YGL212W	YGL023C	YBR085W	YJR032W	YKL212W	YLR111W	YDR424C	YPL242C
##	2	2	2	2	2	2	2	2
##	YLR210W	YHL007C	YDR310C	YNL322C	YHR101C	YDR192C	YJL213W	YOR208W
##	2	2	2	2	2	2	2	2
##	YJL035C	YJR118C	YOR194C	YPL018W	YKR010C	YEL031W	YKL073W	YGL217C
##	2	2	2	2	2	2	2	2
##	YJL183W	YFL029C	YGR271W	YMR246W	YFR028C	YGL003C	YOR109W	YGL085W
##	2	2	2	2	2	2	2	2
##	YPL194W	YDR254W	YPR159W	YJL090C	YOR188W	YML124C	YER083C	YER149C
##	2	2	2	2	2	2	2	2
##	YMR307W	YGL240W	YNL250W	YLR189C	YBR289W	YGL251C	YMR129W	YJL099W
##	2	2	2	2	2	2	2	2
##	YPR025C	YEL053C	YPL003W	YPR160W	YCR052W	YPR119W	YPR018W	YDR075W

##	2	2	2	2	2	2	2	2
##	YDR099W	YDL124W	YDR422C	YLL022C	YHR098C	YAR007C	YOL078W	YJR074W
##	2	2	2	2	2	2	2	2
##	YJR064W	YBR175W	YLR321C	YBR225W	YLR262C	YJR006W	YJR144W	YGR233C
##	2	2	2	2	2	2	2	2
##	YLR384C	YDR179C	YDR139C	YDL204W	YKL095W	YDL208W	YDR166C	YJL115W
##	2	2	2	2	2	2	2	2
##	YKL080W	YPR189W	YIR034C	YOR164C	YCL032W	YGR239C	YJR135C	YPL105C
##	2	2	2	2	2	2	2	2
##	YMR159C	YCL055W	YPL002C	YBL016W	YLR190W	YGR058W	YNL161W	YER071C
##	2	2	2	2	2	2	2	2
##	YBR108W	YER062C	YDR233C	YDR261W-A	YPL159C	YLR319C	YPL095C	YLR446W
##	2	2	2	2	2	2	2	2
##	YMR232W	YGR043C	YGR057C	YFL034C-B	YLR354C	YFL010C	YER014W	YLR373C
##	2	2	2	2	2	2	2	2
##	YLR249W	YOR317W	YGL084C	YLR453C	YPL169C	YER060W	YER056C	YGR125W
##	2	2	2	2	2	2	2	2
##	YJR141W	YHL003C	YNR043W	YDR034C	YGR129W	YOR006C	YML079W	YPL090C
##	2	2	2	2	2	2	2	2
##	YBR181C	YNL040W	YDL200C	YIR032C	YKL093W	YDL017W	YDR356W	YBR015C
##	2	2	2	2	2	2	2	2
##	YPR019W	YBR171W	YNL084C	YLR274W	YKL089W	YHR152W	YGR032W	YKL022C
##	2	2	2	2	2	2	2	2
##	YER111C	YER172C	YOR195W	YIL004C	YLR242C	YGL086W	YJL013C	YDR363W
##	2	2	2	2	2	2	2	2
##	YGL163C	YOR058C	YDR149C	YBL056W	YKL045W	YBR125C	YER099C	YDR190C
##	2	2	2	1	1	1	1	1
##	YIL104C	YJR050W	YHR005C	YBR216C	YGR261C	YEL011W	YMR261C	YGR173W
##	1	1	1	1	1	1	1	1
##	YPR104C	YDR342C	YBR195C	YIR005W	YJL042W	YBR010W	YIL071C	YKL122C
##	1	1	1	1	1	1	1	1
##	YIL079C	YKL056C	YKL193C	YDR407C	YLR258W	YOR057W	YBL047C	YOR185C
##	1	1	1	1	1	1	1	1
##	YCL024W	YKR006C	YAR003W	YCL014W	YGR292W	YER162C	YDR412W	YFL006W
##	1	1	1	1	1	1	1	1
##	YPL208W	YJL006C	YPL074W	YGL150C	YFR021W	YBL066C	YKL019W	YLR113W
##	1	1	1	1	1	1	1	1
##	YMR303C	YDL042C	YOR106W	YOR276W	YIL136W	YBR143C	YAL027W	YOR110W
##	1	1	1	1	1	1	1	1
##	YCR020C-A	YER089C	YOR370C	YDR395W	YML095C	YLR304C	YBR133C	YAR014C
##	1	1	1	1	1	1	1	1
##	YDR021W	YLR097C	YDL070W	YDL077C	YGL058W	YNR054C	YEL060C	YPL193W
##	1	1	1	1	1	1	1	1
##	YDR256C	YDR439W	YHL006C	YNL152W	YOR385W	YFR043C	YNL329C	YHR060W
##	1	1	1	1	1	1	1	1
##	YML031W	YHR121W	YEL043W	YDR142C	YHL018W	YDR013W	YJL039C	YLR019W
##	1	1	1	1	1	1	1	1
##	YGL036W	YDR446W	YJR094C	YDL084W	YPR083W	YJL072C	YHR034C	YKL052C
##	1	1	1	1	1	1	1	1
##	YOR034C	YPL133C	YMR204C	YGL192W	YDR277C	YGR223C	YER141W	YBL006C
##	1	1	1	1	1	1	1	1
##	YBR077C	YGR165W	YKL038W	YNL331C	YPR001W	YGL015C	YNL020C	YNR001C
##	1	1	1	1	1	1	1	1
##	YGR004W	YCR087C-A	YLR049C	YCR014C	YCL040W	YOR102W	YLR211C	YML056C

##	1	1	1	1	1	1	1	1
##	YPL088W	YNR039C	YIL109C	YML023C	YGL166W	YGL053W	YGL119W	YML034W
##	1	1	1	1	1	1	1	1
##	YFR017C	YGR071C	YDR479C	YJL086C	YPL109C	YCR095C	YGL125W	YDL165W
##	1	1	1	1	1	1	1	1
##	YML037C	YLR142W	YGL254W	YNR068C	YKL043W	YJL019W	YCR076C	YPL149W
##	1	1	1	1	1	1	1	1
##	YLR030W	YOR037W	YGR066C	YDL218W	YDL237W	YBL068W	YDR100W	YOR243C
##	1	1	1	1	1	1	1	1
##	YDR383C	YPL219W	YDL224C	YDR527W	YPL114W	YDR105C	YDR533C	YJL070C
##	1	1	1	1	1	1	1	1
##	YHR156C	YOR247W	YKR099W	YJR110W	YPR106W	YOL052C	YOR232W	YOR115C
##	1	1	1	1	1	1	1	1
##	YBR187W	YBR056W	YJR097W	YKL186C	YGR209C	YPR126C	YJR133W	YHL009C
##	1	1	1	1	1	1	1	1
##	YKL035W	YLR118C	YMR316W	YNL277W	YLR267W	YMR270C	YIR038C	YJL176C
##	1	1	1	1	1	1	1	1
##	YGL189C	YNL054W-B	YER143W	YGR081C	YER151C	YDL044C	YCL063W	YJR048W
##	1	1	1	1	1	1	1	1
##	YNL199C	YML119W	YDR366C	YJR056C	YDR052C	YNL216W	YOR101W	YGR146C
##	1	1	1	1	1	1	1	1
##	YNL280C	YJR159W	YEL062W	YHL021C	YKR094C	YIL148W	YCR020C	YNL320W
##	1	1	1	1	1	1	1	1
##	YDR044W	YHR029C	YLR177W	YOR092W	YBR287W	YOL137W	YHR047C	YER078C
##	1	1	1	1	1	1	1	1
##	YER142C	YBR207W	YNL095C	YML105C	YDR403W	YCR037C	YML060W	YFR006W
##	1	1	1	1	1	1	1	1
##	YLR152C	YOR311C	YNR013C	YLL029W	YDR109C	YER145C	YOR143C	YIL137C
##	1	1	1	1	1	1	1	1
##	YKL106W	YGR070W	YML055W	YMR138W	YNL117W	YHR172W	YLR216C	YJR010C-A
##	1	1	1	1	1	1	1	1
##	YOR182C	YCL027W	YER167W	YML104C	YOR033C	YGR082W	YBR202W	YOL100W
##	1	1	1	1	1	1	1	1
##	YGR006W	YBR050C	YOR254C	YDL028C	YLL043W	YCL061C	YLR085C	YML115C
##	1	1	1	1	1	1	1	1
##	YKL049C	YER114C	YMR149W	YPL065W	YLR206W	YER165W	YOR103C	YMR302C
##	1	1	1	1	1	1	1	1
##	YDL063C	YDL101C	YLL002W	YDR080W	YPL240C	YDR320C	YDL229W	YPL152W
##	1	1	1	1	1	1	1	1
##	YPL218W	YDL049C	YCR048W	YJR040W	YJL002C	YJL054W	YMR104C	YBR188C
##	1	1	1	1	1	1	1	1
##	YNR019W	YMR109W	YMR198W	YCR038C	YGL244W	YNL119W	YLR139C	YML097C
##	1	1	1	1	1	1	1	1
##	YMR106C	YAL020C	YDR323C	YOR085W	YGL116W	YGL124C	YHL027W	YPR135W
##	1	1	1	1	1	1	1	1
##	YGL073W	YBL103C	YDR059C	YKR086W	YOR045W	YMR081C	YAL030W	YCR034W
##	1	1	1	1	1	1	1	1
##	YNR038W	YPR072W	YJL148W	YNL116W	YIR033W	YHR103W	YHR031C	YGR080W
##	1	1	1	1	1	1	1	1
##	YBL051C	YNL121C	YOR157C	YDR469W	YDR022C	YLR192C	YKL189W	YGR196C
##	1	1	1	1	1	1	1	1
##	YHL002W	YOR353C	YNL169C	YDR152W	YDR343C	YGL174W	YDL137W	YNR046W
##	1	1	1	1	1	1	1	1
##	YML065W	YCL028W	YML088W	YLR270W	YOL117W	YLL010C	YDL092W	YDR097C

##	1	1	1	1	1	1	1	1
##	YDR082W	YMR218C	YFR015C	YDR170C	YML077W	YOL093W	YCR030C	YKL028W
##	1	1	1	1	1	1	1	1
##	YDR405W	YGR075C	YBR299W	YEL037C	YFL007W	YDR361C	YNL172W	YML112W
##	1	1	1	1	1	1	1	1
##	YGL060W	YKL082C	YNL242W	YNL210W	YDL090C	YAL036C	YGL158W	YDL095W
##	1	1	1	1	1	1	1	1
##	YFL042C	YDR227W	YJL024C	YBR091C	YGR154C	YKL152C	YEL022W	YPL085W
##	1	1	1	1	1	1	1	1
##	YJL033W	YMR028W	YLL026W	YLR196W	YOL054W	YOL070C	YBR264C	YCR079W
##	1	1	1	1	1	1	1	1
##	YPL140C	YIL113W	YAL059W	YFR011C	YLR399C	YHR016C	YDL159W	YNL023C
##	1	1	1	1	1	1	1	1
##	YHR051W	YHR084W	YCR066W	YDL216C	YDR365C	YPL036W	YOL108C	YNL208W
##	1	1	1	1	1	1	1	1
##	YJR055W	YBL081W	YOR264W	YIL008W	YHR057C	YLR254C	YDR078C	YLR126C
##	1	1	1	1	1	1	1	1
##	YJL184W	YGR122W	YKL197C	YOR159C	YKR088C	YJL151C	YLR440C	YJR125C
##	1	1	1	1	1	1	1	1
##	YOR023C	YJR086W	YML014W	YJL048C	YDR271C	YER106W	YGL170C	YKR100C
##	1	1	1	1	1	1	1	1
##	YER063W	YCR060W	YBR239C	YKL050C	YCL033C	YJL185C	YBR255W	YDL121C
##	1	1	1	1	1	1	1	1
##	YJL068C	YKL142W	YMR233W	YKR034W	YLR239C	YOR028C	YCR005C	YMR163C
##	1	1	1	1	1	1	1	1
##	YAR073W	YOR302W	YKL010C	YBR246W	YPL125W	YGR241C	YDR357C	YLR031W
##	1	1	1	1	1	1	1	1
##	YGR163W	YOR097C	YFR025C	YJR083C	YPL201C	YDR261W-B	YGR170W	YGR161C-C
##	1	1	1	1	1	1	1	1
##	YKR082W	YOR074C	YIL039W	YLR253W	YHR184W	YDR273W	YDR026C	YDR205W
##	1	1	1	1	1	1	1	1
##	YDR252W	YGR189C	YPL023C	YJL153C	YER038C	YLR376C	YJL057C	YGR247W
##	1	1	1	1	1	1	1	1
##	YPR136C	YLR420W	YPR184W	YBL078C	YEL018W	YNL049C	YBR284W	YBR155W
##	1	1	1	1	1	1	1	1
##	YDL013W	YLR072W	YPR172W	YJL180C	YNL273W	YMR280C	YOR318C	YMR030W
##	1	1	1	1	1	1	1	1
##	YCL056C	YOR330C	YEL048C	YOL131W	YLR451W	YPR148C	YLR263W	YBL010C
##	1	1	1	1	1	1	1	1
##	YJR134C	YNL105W	YMR154C	YOR359W	YDR203W	YOR324C	YDR455C	YDL118W
##	1	1	1	1	1	1	1	1
##	YMR133W	YIL122W	YPL233W	YIL007C	YLR185W	YDR500C	YKL023W	YEL013W
##	1	1	1	1	1	1	1	1
##	YOL129W	YLR026C	YAL028W	YDR504C	YDL154W	YLR156W	YLR223C	YNR050C
##	1	1	1	1	1	1	1	1
##	YDR214W	YKL076C	YOR124C	YKL075C	YKL181W	YHR143W-A	YDL088C	YMR067C
##	1	1	1	1	1	1	1	1
##	YBR212W	YOR281C	YFR007W	YDR529C	YPL138C	YGR110W	YLR005W	YDR005C
##	1	1	1	1	1	1	1	1
##	YGL145W	YER128W	YGL225W	YLR112W	YDR194C	YGR185C	YHR130C	YLR303W
##	1	1	1	1	1	1	1	1
##	YDL217C	YHR180W	YDR541C	YLR059C	YER039C	YER180C	YOR289W	YNR048W
##	1	1	1	1	1	1	1	1
##	YAL060W	YNR051C	YBR223C	YOR220W	YIL092W	YDR008C	YNL042W	YLL032C

```
##      1      1      1      1      1      1      1      1
## YMR273C YKL044W YOL050C YKL107W YDR423C YOR112W YHR177W YJR011C
##      1      1      1      1      1      1      1      1
## YHR014W YML127W YPR118W YNL249C YLR056W YDR297W YGR060W YGR007W
##      1      1      1      1      1      1      1      1
## YJL125C YOL008W YDR171W YHR144C YFL060C YKL157W YNL045W YGL017W
##      1      1      1      1      1      1      1      1
## YOR005C YGR202C YHR201C YML005W YHR070W YMR013C YJL198W YPR163C
##      1      1      1      1      1      1      1      1
## YOR008C YDR160W YML062C YLR335W YIL095W YKR042W YMR039C YAL013W
##      1      1      1      1      1      1      1      1
## YAL024C YIL009W YDR085C YMR168C YLR238W YHR115C YDR027C YDR200C
##      1      1      1      1      1      1      1      1
## YPR133W-A YPR111W YDR146C YBL085W YBL023C YEL032W YLR045C YKL139W
##      1      1      1      1      1      1      1      1
## YGL038C YHR079C YLR116W YIR031C YLR195C YGL097W YNL299W YHR154W
##      1      1      1      1      1      1      1      1
## YLR306W YBR021W YDR164C YNL209W YKL196C YIL153W YCR067C YJL174W
##      1      1      1      1      1      1      1      1
## YOR297C YKL126W YGL226C-A YDR177W YMR022W YER015W YBR080C YBL050W
##      1      1      1      1      1      1      1      1
## YOR257W YNL102W YBR097W YDR495C YGL095C YPL155C YHR202W YPL209C
##      1      1      1      1      1      1      1      1
## YGR238C YNL031C YGR116W YBL082C YHR134W YIL030C YNL006W YKL176C
##      1      1      1      1      1      1      1      1
## YMR284W YGL027C YGR098C YBL069W YHR010W YPR116W YDR369C YDR217C
##      1      1      1      1      1      1      1      1
## YBR215W YOL068C YOR025W YMR224C YNL171C YOR160W YAL026C YLR425W
##      1      1      1      1      1      1      1      1
## YNL289W YMR299C YOR153W YKR047W YIL159W YDL117W YLR381W YJR053W
##      1      1      1      1      1      1      1      1
## YDR289C YBR095C YBR107C YNL170W YHR191C YBR231C YNL215W YNL307C
##      1      1      1      1      1      1      1      1
## YML016C YCL016C YJR143C YOR321W YKL092C YLR372W YOR027W YER068W
##      1      1      1      1      1      1      1      1
## YER122C YKL020C YDR351W YLR433C YKL190W YLL050C YLR235C YNL098C
##      1      1      1      1      1      1      1      1
## YMR060C
##      1
```

```
#los 10 más conectados son YPR110C, YPL131W, YNL178W, YIL021W, YOL127W, YJL063C, YBR283C, YLR378C, YMR2
diameter(yeast) #diámetro antes de borrar = 15
```

```
## [1] 15
```

```
#Diametro -1 =15
meno1 <- delete.vertices(yeast, v = "YPR110C")
diameter(meno1)
```

```
## [1] 15
```

```
#Diametro -2 =15
meno2 <- delete.vertices(yeast, v = "YPL131W")
diameter(meno2)
```

```
## [1] 15
```

```
#Diametro -3 =15
meno3 <- delete.vertices(yeast, v = "YNL178W")
diameter(meno3)
```

```
## [1] 15
```

```
#diámetro -4= 15
meno4 <- delete.vertices(yeast, v = "YIL021W")
diameter(meno4)
```

```
## [1] 15
```

```
#diámetro -5= 15 YOL127W
meno5<- delete.vertices(yeast, v = "YOL127W")
diameter(meno5)
```

```
## [1] 15
```

```
#diámetro -6= 15
meno6<- delete.vertices(yeast, v = "YJL063C")
diameter(meno6)
```

```
## [1] 15
```

```
#diámetro -7= 15
meno7<- delete.vertices(yeast, v = "YBR283C")
diameter(meno7)
```

```
## [1] 15
```

```
#diámetro -8= 15
meno8<- delete.vertices(yeast, v = "YLR378C")
diameter(meno8)
```

```
## [1] 15
```

```
#diámetro -9= 15
meno9<- delete.vertices(yeast, v = "YMR260C")
diameter(meno9)
```

```
## [1] 15
```



```
#diámetro -10=15
meno10<- delete.vertices(yeast, v = "YBR251W")
diameter(meno10)
```

```
## [1] 15
```

h. Determine los diez nodos más importantes por al menos tres medidas de centralidad.

```
is.directed(yeast) #Dice que no, por lo que asumimos que la red es no dirigida.
```

```
## [1] FALSE
```

```
excentricidad<-eccentricity(yeast)# calculo la excentricidad de la red, que es la distancia del nodo a
sort(excentricidad, decreasing=FALSE)
```

##	YBL046W	YHR102W	YGR173W	YDR342C	YIR005W	YNL201C	YDR188W	YIL071C
##	1	1	1	1	1	1	1	1
##	YKL122C	YDL220C	YDR407C	YLR258W	YBL047C	YCL014W	YGR292W	YER162C
##	1	1	1	1	1	1	1	1
##	YFL006W	YPL208W	YJL006C	YFR021W	YBL066C	YKL019W	YLR113W	YAL023C
##	1	1	1	1	1	1	1	1
##	YMR303C	YDL042C	YOR370C	YDR395W	YDL070W	YGL058W	YNR054C	YGL008C
##	1	1	1	1	1	1	1	1
##	YEL060C	YPL193W	YDL167C	YHL006C	YNL329C	YOR212W	YKL008C	YDL084W
##	1	1	1	1	1	1	1	1
##	YHR034C	YPL133C	YMR204C	YDR520C	YNL020C	YKR007W	YCR014C	YNR039C
##	1	1	1	1	1	1	1	1
##	YML023C	YFR017C	YOR037W	YDL237W	YPL114W	YJL070C	YOR247W	YOL052C
##	1	1	1	1	1	1	1	1
##	YBR056W	YKL186C	YNL277W	YER151C	YML119W	YMR298W	YHR193C	YNL070W
##	1	1	1	1	1	1	1	1
##	YER114C	YDL229W	YPL152W	YPL218W	YDL049C	YJL054W	YMR104C	YBR082C
##	1	1	1	1	1	1	1	1
##	YLR139C	YCR034W	YPR072W	YIR033W	YHR103W	YGR080W	YNL121C	YBR170C
##	1	1	1	1	1	1	1	1
##	YDR152W	YDR343C	YGL174W	YDR075W	YOL117W	YDL092W	YMR218C	YFR015C
##	1	1	1	1	1	1	1	1
##	YCR030C	YDR405W	YBR299W	YEL037C	YFL007W	YDR361C	YML112W	YNL242W
##	1	1	1	1	1	1	1	1
##	YNL210W	YDL090C	YGL158W	YFL042C	YDR227W	YBR264C	YAL059W	YLR399C
##	1	1	1	1	1	1	1	1
##	YMR231W	YCR066W	YDR365C	YNL208W	YJR055W	YDR078C	YKL197C	YCL055W
##	1	1	1	1	1	1	1	1
##	YER063W	YCR060W	YBR239C	YJL185C	YGR241C	YFR025C	YDR205W	YER038C
##	1	1	1	1	1	1	1	1
##	YPR184W	YCL056C	YPR148C	YMR133W	YDR504C	YLR223C	YDR214W	YFR007W
##	1	1	1	1	1	1	1	1
##	YPL138C	YHL003C	YLR303W	YNR051C	YLL032C	YOR006C	YKL029C	YDL200C
##	1	1	1	1	1	1	1	1
##	YBL085W	YNL209W	YIL153W	YCR067C	YJL174W	YLR242C	YOR297C	YKL126W

##	1	1	1	1	1	1	1	1
##	YIL030C	YLR372W	YER068W	YKL020C	YDR351W	YLL050C	YMR060C	YHR005C
##	1	1	1	1	1	1	1	2
##	YGR048W	YDL126C	YLR025W	YPL049C	YBL058W	YHR119W	YHL011C	YDR049W
##	2	2	2	2	2	2	2	2
##	YDL077C	YNL258C	YGL036W	YGL192W	YBR077C	YOR275C	YKR022C	YLR148W
##	2	2	2	2	2	2	2	2
##	YPL045W	YLR396C	YPR173C	YKR094C	YIL148W	YOR092W	YBR287W	YER142C
##	2	2	2	2	2	2	2	2
##	YNL095C	YML060W	YLR152C	YGR082W	YCR048W	YNR019W	YMR106C	YDR059C
##	2	2	2	2	2	2	2	2
##	YOR045W	YOL061W	YDR490C	YNL032W	YKL189W	YOR353C	YCL028W	YDR082W
##	2	2	2	2	2	2	2	2
##	YDL095W	YMR028W	YPL036W	YBL081W	YJR086W	YKR034W	YBR246W	YGR163W
##	2	2	2	2	2	2	2	2
##	YBR212W	YJL125C	YML062C	YPR133W-A	YDR177W	YMR022W	YOR257W	YMR284W
##	2	2	2	2	2	2	2	2
##	YBL069W	YJR143C	YOR321W	YER099C	YLR015W	YNL056W	YGR086C	YNL099C
##	2	2	2	3	3	3	3	3
##	YOR043W	YPL004C	YGR040W	YDR480W	YBL068W	YOL100W	YBR175W	YGR122W
##	3	3	3	3	3	3	3	3
##	YLR440C	YBL016W	YBL010C	YMR154C	YKL181W	YGL145W	YER128W	YDR541C
##	3	3	3	3	3	3	3	3
##	YAR003W	YPL074W	YLR019W	YCR095C	YDR469W	YLL010C	YDL159W	YHR084W
##	4	4	4	4	4	4	4	4
##	YKL142W	YEL048C	YDR394W	YMR049C	YDR127W	YKL145W	YOR272W	YMR290C
##	4	4	8	8	8	8	8	8
##	YHL030W	YKL067W	YCL017C	YJL138C	YPL135W	YGL245W	YAL035W	YJR109C
##	8	8	8	8	8	8	8	8
##	YMR012W	YGR240C	YIL033C	YNL085W	YNL189W	YLR231C	YPR067W	YDR283C
##	8	8	8	8	8	8	8	8
##	YLL027W	YPR033C	YPL252C	YGL018C	YIL094C	YOR226C	YLR197W	YOR039W
##	8	8	8	8	8	8	9	9
##	YER090W	YER021W	YKL166C	YOR061W	YGL049C	YGR158C	YPR010C	YPL093W
##	9	9	9	9	9	9	9	9
##	YER006W	YFR052W	YOR261C	YHR052W	YDR280W	YGR162W	YDR101C	YOL041C
##	9	9	9	9	9	9	9	9
##	YHR197W	YLL008W	YPL043W	YOR117W	YOR310C	YNL002C	YBR126C	YKL014C
##	9	9	9	9	9	9	9	9
##	YPL012W	YPL203W	YJL203W	YLR222C	YOL077C	YFR001W	YKR081C	YDR496C
##	9	9	9	9	9	9	9	9
##	YMR205C	YDR087C	YGR145W	YOR326W	YMR309C	YDR388W	YER178W	YNL071W
##	9	9	9	9	9	9	9	9
##	YKL103C	YBR221C	YJL026W	YDL185W	YNR016C	YKL182W	YGR103W	YGL019W
##	9	9	9	9	9	9	9	9
##	YIL125W	YDL097C	YPR016C	YFL018C	YCL030C	YBR256C	YFR004W	YDL007W
##	9	9	9	9	9	9	9	9
##	YDL111C	YLR175W	YHR200W	YHR069C	YNL132W	YOR206W	YNL061W	YGR095C
##	9	9	9	9	9	9	9	9
##	YOR259C	YIL116W	YGR195W	YLR347C	YGL137W	YJR093C	YJL164C	YPR108W
##	9	9	9	9	9	9	9	9
##	YBL004W	YGR090W	YDR240C	YGL111W	YMR125W	YHR216W	YOL021C	YDL029W
##	9	9	9	9	9	9	9	9
##	YJL109C	YDL147W	YMR314W	YDL031W	YGR135W	YCR035C	YPL111W	YBR208C

##	9	9	9	9	9	9	9	9
##	YKL172W	YOR136W	YKL104C	YLR355C	YOR142W	YER174C	YCR012W	YGL011C
##	9	9	9	9	9	9	9	9
##	YKL009W	YGR245C	YGL009C	YER012W	YGL195W	YOR184W	YOR001W	YBR160W
##	9	9	9	9	9	9	9	9
##	YMR239C	YPL266W	YOR180C	YDL014W	YLR449W	YDR337W	YOR362C	YJL005W
##	9	9	9	9	9	9	9	9
##	YPL211W	YDR385W	YBR142W	YIL128W	YER126C	YER052C	YGR218W	YGR232W
##	9	9	9	9	9	9	9	9
##	YBR009C	YMR308C	YGR267C	YHR033W	YER002W	YLR421C	YOL086C	YKR002W
##	9	9	9	9	9	9	9	9
##	YAL003W	YGR234W	YIL061C	YDR036C	YOR181W	YPR191W	YLR002C	YGL207W
##	9	9	9	9	9	9	9	9
##	YGR155W	YDL134C	YHR066W	YFL002C	YMR108W	YBR272C	YMR172W	YER155C
##	9	9	9	9	9	9	9	9
##	YOR202W	YOR035C	YBR103W	YDR427W	YBR025C	YHR114W	YCL009C	YBR136W
##	9	9	9	9	9	9	9	9
##	YHR086W	YBR109C	YBL039C	YCL059C	YDR502C	YOL139C	YDR130C	YNL139C
##	9	9	9	9	9	9	9	9
##	YML032C	YOR323C	YDL175C	YLR106C	YMR229C	YBL007C	YFL045C	YAR002W
##	9	9	9	9	9	9	9	9
##	YNL088W	YHR111W	YOR167C	YML064C	YLR245C	YNR033W	YJL045W	YJR051W
##	9	9	9	9	9	9	9	9
##	YLL041C	YKL148C	YDR510W	YFL059W	YGR010W	YMR118C	YPR004C	YDR115W
##	9	9	9	9	9	9	9	9
##	YBL080C	YHL018W	YKL141W	YKL192C	YDR148C	YBR002C	YMR101C	YGL221C
##	9	9	9	9	9	9	9	9
##	YOR111W	YDL193W	YBR072W	YHR038W	YJL130C	YDR174W	YOR155C	YIL020C
##	9	9	9	9	9	9	9	9
##	YOR303W	YOR020C	YIL066C	YPL231W	YGR180C	YKL130C	YJL093C	YOR284W
##	9	9	9	9	9	9	9	9
##	YML125C	YDR487C	YHR168W	YBR176W	YDR454C	YGR136W	YJL199C	YPL017C
##	9	9	9	9	9	9	9	9
##	YOL023W	YDR064W	YPR060C	YGR144W	YML009C	YGL205W	YGL211W	YDR270W
##	9	9	9	9	9	9	9	9
##	YGL040C	YBR295W	YEL066W	YDR453C	YLR284C	YGR214W	YLR377C	YPL028W
##	9	9	9	9	9	9	9	9
##	YHR025W	YLR048W	YBR029C	YDR201W	YOR285W	YBR137W	YNL026W	YHR129C
##	9	9	9	9	9	9	9	9
##	YNL292W	YIL160C	YER055C	YAL054C	YGL059W	YNL331C	YPR193C	YGR148C
##	9	9	9	9	9	9	9	9
##	YAL038W	YER154W	YIL042C	YGL031C	YLR264W	YDR060W	YCL040W	YDR047W
##	9	9	9	9	9	9	9	9
##	YJL218W	YPL088W	YCR009C	YNR053C	YKL216W	YDR236C	YNL005C	YJR010W
##	9	9	9	9	9	9	9	9
##	YPR074C	YGL166W	YBR117C	YBL076C	YKL150W	YGL037C	YHR208W	YNL232W
##	9	9	9	9	9	9	9	9
##	YKL211C	YGR207C	YLR328W	YNL123W	YGL175C	YIL147C	YIL043C	YNL092W
##	9	9	9	9	9	9	9	9
##	YOR093C	YBR222C	YLR209C	YER096W	YOR076C	YER110C	YIR027C	YCR003W
##	9	9	9	9	9	9	9	9
##	YDL052C	YCR076C	YIL154C	YOR133W	YDR196C	YNL044W	YML059C	YPL091W
##	9	9	9	9	9	9	9	9
##	YLR180W	YDR100W	YGL148W	YGR244C	YDR383C	YDR018C	YGR024C	YKL040C

##	9	9	9	9	9	9	9	9
##	YNL072W	YDR318W	YLR342W	YEL021W	YER168C	YFR050C	YPL059W	YPL148C
##	9	9	9	9	9	9	9	9
##	YDR533C	YIL035C	YOL142W	YNL316C	YOL018C	YPR113W	YDL227C	YGR276C
##	9	9	9	9	9	9	9	9
##	YBR088C	YML042W	YJR133W	YHL009C	YDL142C	YOR209C	YOR131C	YBR041W
##	9	9	9	9	9	9	9	9
##	YJR056C	YMR186W	YFR009W	YGR192C	YJR057W	YFR047C	YDL033C	YDR268W
##	9	9	9	9	9	9	9	9
##	YJR070C	YPR201W	YOL097C	YPL227C	YGL169W	YDR044W	YKR031C	YBR121C
##	9	9	9	9	9	9	9	9
##	YDL174C	YDL178W	YPR081C	YEL071W	YMR177W	YJR148W	YHR206W	YHR088W
##	9	9	9	9	9	9	9	9
##	YER171W	YBR243C	YNL220W	YFL033C	YLR107W	YBR166C	YDR341C	YHR032W
##	9	9	9	9	9	9	9	9
##	YDL078C	YCL004W	YDR338C	YPR183W	YGL094C	YOL126C	YKL085W	YOL080C
##	9	9	9	9	9	9	9	9
##	YJL046W	YKR059W	YCL029C	YDR129C	YMR190C	YLR234W	YFL039C	YDR138W
##	9	9	9	9	9	9	9	9
##	YNL079C	YDR098C	YNL110C	YLR009W	YGL105W	YOL082W	YGR193C	YPL235W
##	9	9	9	9	9	9	9	9
##	YER070W	YJR016C	YDR432W	YCL054W	YLR276C	YHR020W	YKL081W	YJR132W
##	9	9	9	9	9	9	9	9
##	YOL078W	YAL036C	YOR227W	YJL187C	YDL208W	YHL004W	YEL047C	YBR248C
##	9	9	9	9	9	9	9	9
##	YGL048C	YMR038C	YBR108W	YLR006C	YPL104W	YOR347C	YOR286W	YML087C
##	9	9	9	9	9	9	9	9
##	YPL040C	YFL010C	YBR042C	YLR259C	YHR091C	YOL064C	YOR095C	YML086C
##	9	9	9	9	9	9	9	9
##	YPL224C	YNL243W	YOL076W	YOR332W	YGL026C	YDL140C	YLR291C	YBR154C
##	9	9	9	10	10	10	10	10
##	YOR116C	YIL062C	YOR260W	YMR193W	YPR187W	YBL045C	YOR207C	YGL220W
##	10	10	10	10	10	10	10	10
##	YCR077C	YOR341W	YLR409C	YMR146C	YMR061W	YIL112W	YBR251W	YLR370C
##	10	10	10	10	10	10	10	10
##	YLL036C	YBR135W	YIL021W	YOL149W	YJL098W	YPL126W	YDL060W	YDR228C
##	10	10	10	10	10	10	10	10
##	YDL225W	YLR166C	YNL113W	YFR040W	YIR001C	YER081W	YER094C	YLR423C
##	10	10	10	10	10	10	10	10
##	YGL123W	YNL284C	YML025C	YOL040C	YGR034W	YMR188C	YDL191W	YFR030W
##	10	10	10	10	10	10	10	10
##	YDL136W	YGR220C	YNR037C	YOL127W	YLR340W	YFL022C	YBL038W	YDR041W
##	10	10	10	10	10	10	10	10
##	YHL015W	YGR264C	YFR049W	YDR354W	YJL063C	YPL183W-A	YDR190C	YDR116C
##	10	10	10	10	10	10	10	10
##	YDR091C	YOR151C	YGR013W	YMR189W	YDR301W	YKR068C	YBR055C	YAL044C
##	10	10	10	10	10	10	10	10
##	YOL058W	YBL033C	YDR158W	YGR020C	YBR127C	YOR270C	YOR210W	YPR167C
##	10	10	10	10	10	10	10	10
##	YLR447C	YDR211W	YNR035C	YLR117C	YGR091W	YDR195W	YAL016W	YBR260C
##	10	10	10	10	10	10	10	10
##	YER069W	YJR065C	YNL287W	YJR113C	YGL190C	YOL038W	YER022W	YML100W
##	10	10	10	10	10	10	10	10
##	YDR299W	YDL145C	YER026C	YDL188C	YJL088W	YDR449C	YFR037C	YER082C

##	10	10	10	10	10	10	10	10
##	YBR079C	YFR051C	YGR262C	YML092C	YJR007W	YNR003C	YPR110C	YCR057C
##	10	10	10	10	10	10	10	10
##	YPR104C	YBR146W	YER016W	YCR093W	YER086W	YKL013C	YAL029C	YGR263C
##	10	10	10	10	10	10	10	10
##	YHR203C	YMR047C	YDR324C	YDL047W	YIL076W	YPL139C	YDL030W	YHR018C
##	10	10	10	10	10	10	10	10
##	YLR153C	YKR060W	YJR063W	YBL002W	YGL068W	YGL120C	YKL001C	YLR129W
##	10	10	10	10	10	10	10	10
##	YGL156W	YLR432W	YBL041W	YIL093C	YIL078W	YCR033W	YEL054C	YKL143W
##	10	10	10	10	10	10	10	10
##	YKR069W	YMR199W	YDR140W	YNL333W	YNL182C	YNL262W	YPL204W	YPL256C
##	10	10	10	10	10	10	10	10
##	YNL104C	YGL022W	YGL070C	YJR111C	YML022W	YBR218C	YDL051W	YHR024C
##	10	10	10	10	10	10	10	10
##	YJL001W	YPR054W	YNL124W	YPR181C	YDR381W	YOR335C	YGL171W	YOL004W
##	10	10	10	10	10	10	10	10
##	YEL002C	YLR438W	YJR101W	YKL056C	YOR340C	YPL217C	YCR046C	YCR053W
##	10	10	10	10	10	10	10	10
##	YGR161C	YLR029C	YKL007W	YMR105C	YNL075W	YMR116C	YPR137W	YGL099W
##	10	10	10	10	10	10	10	10
##	YPL001W	YAL033W	YMR128W	YFR044C	YHR170W	YER029C	YPR023C	YER093C
##	10	10	10	10	10	10	10	10
##	YHR174W	YKR067W	YJL080C	YDR225W	YDR311W	YPR190C	YDR300C	YOR204W
##	10	10	10	10	10	10	10	10
##	YMR158W	YLL011W	YLR293C	YKL218C	YBR200W	YIL070C	YHR196W	YGR150C
##	10	10	10	10	10	10	10	10
##	YJR043C	YPL013C	YOR145C	YLL018C	YMR095C	YLR200W	YOR329C	YNL138W
##	10	10	10	10	10	10	10	10
##	YOL010W	YGL130W	YKL099C	YDR386W	YHR059W	YHR085W	YPL258C	YKL060C
##	10	10	10	10	10	10	10	10
##	YOR276W	YLL034C	YDR074W	YNL112W	YIL063C	YLR371W	YOL006C	YML069W
##	10	10	10	10	10	10	10	10
##	YBL003C	YHR030C	YNL016W	YLR304C	YHR041C	YGR270W	YBR133C	YHR023W
##	10	10	10	10	10	10	10	10
##	YLR186W	YJR104C	YNL135C	YPL153C	YAL025C	YER008C	YPR103W	YPL009C
##	10	10	10	10	10	10	10	10
##	YMR093W	YER127W	YHR147C	YPR047W	YDL239C	YDL100C	YDL226C	YPR105C
##	10	10	10	10	10	10	10	10
##	YJR123W	YNR036C	YPR132W	YOR063W	YPL131W	YGL147C	YNL067W	YLR367W
##	10	10	10	10	10	10	10	10
##	YJL190C	YIL018W	YGL103W	YLR344W	YGR085C	YPR102C	YNL178W	YBR283C
##	10	10	10	10	10	10	10	10
##	YLR378C	YMR217W	YDL061C	YDR237W	YPR166C	YLR388W	YDR418W	YDL161W
##	10	10	10	10	10	10	10	10
##	YML010W	YLR075W	YPL220W	YGL135W	YKL003C	YLR060W	YNL306W	YEL015W
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##	YKL049C	YOR349W	YOR265W	YDR192C	YJL034W	YDR156W	YPL065W	YLR206W
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##	YPL018W	YDR364C	YGL216W	YKL074C	YGL217C	YMR302C	YMR246W	YGR252W
##	11	11	11	11	11	11	11	11
##	YDL063C	YLL002W	YOL115W	YDR080W	YKR054C	YDR054C	YPL240C	YER105C
##	11	11	11	11	11	11	11	11
##	YDR212W	YPL241C	YBR188C	YMR109W	YER173W	YGL085W	YMR198W	YCR038C
##	11	11	11	11	11	11	11	11
##	YOR290C	YGL244W	YLR071C	YNL119W	YML097C	YPL194W	YKL068W	YHR158C
##	11	11	11	11	11	11	11	11
##	YAL020C	YDR323C	YDL102W	YDR254W	YGR229C	YGR140W	YFR019W	YJL090C
##	11	11	11	11	11	11	11	11
##	YGL116W	YGL124C	YER007W	YER107C	YHL027W	YPR135W	YMR307W	YGL240W
##	11	11	11	11	11	11	11	11
##	YBL103C	YNL126W	YAL040C	YNR038W	YIL002C	YMR129W	YBL051C	YOR157C
##	11	11	11	11	11	11	11	11
##	YDR020C	YMR236W	YDR022C	YLR192C	YDR176W	YGR196C	YPR160W	YNL169C
##	11	11	11	11	11	11	11	11
##	YCR052W	YBR245C	YJL061W	YCR002C	YNR046W	YHR099W	YMR226C	YLL022C

##	11	11	11	11	11	11	11	11
##	YHR098C	YHR135C	YMR091C	YJR074W	YHR064C	YKL028W	YLR321C	YLR262C
##	11	11	11	11	11	11	11	11
##	YJR006W	YPR112C	YGR154C	YKL152C	YJL033W	YLL026W	YKL095W	YPL161C
##	11	11	11	11	11	11	11	11
##	YPL140C	YIL113W	YFR011C	YNL023C	YKL080W	YPR189W	YIR034C	YHR057C
##	11	11	11	11	11	11	11	11
##	YGR120C	YEL041W	YMR032W	YLR126C	YOR164C	YCL032W	YGR239C	YJR135C
##	11	11	11	11	11	11	11	11
##	YKR088C	YJL151C	YPL105C	YLR190W	YPL174C	YGL170C	YJL058C	YKR100C
##	11	11	11	11	11	11	11	11
##	YKL050C	YCL033C	YER071C	YDL121C	YER062C	YDR261W-A	YJL068C	YPL172C
##	11	11	11	11	11	11	11	11
##	YPL159C	YMR233W	YLR239C	YOR028C	YCR005C	YMR163C	YAR073W	YLR319C
##	11	11	11	11	11	11	11	11
##	YLR031W	YNL247W	YJR083C	YLR446W	YGR170W	YOR074C	YLR253W	YHR184W
##	11	11	11	11	11	11	11	11
##	YDR273W	YDR026C	YGR189C	YJL153C	YLR376C	YJL057C	YPR136C	YNL047C
##	11	11	11	11	11	11	11	11
##	YLR420W	YNL049C	YBR284W	YBR155W	YDL013W	YLR072W	YPR172W	YNL273W
##	11	11	11	11	11	11	11	11
##	YOR318C	YLR373C	YJR134C	YNL105W	YOR317W	YOR359W	YDR203W	YPR175W
##	11	11	11	11	11	11	11	11
##	YOR324C	YDR455C	YDL118W	YPL233W	YKL023W	YEL013W	YOL129W	YAL028W
##	11	11	11	11	11	11	11	11
##	YBR037C	YDL154W	YHL001W	YKL006W	YLR156W	YNR050C	YKL076C	YHR143W-A
##	11	11	11	11	11	11	11	11
##	YDL088C	YMR067C	YER060W	YLR005W	YDR005C	YER056C	YDR194C	YGR185C
##	11	11	11	11	11	11	11	11
##	YHR130C	YGR121C	YHR180W	YLR059C	YER039C	YER180C	YOR289W	YMR055C
##	11	11	11	11	11	11	11	11
##	YNR043W	YNR048W	YAL060W	YDR008C	YNL042W	YMR273C	YDR034C	YOL050C
##	11	11	11	11	11	11	11	11
##	YDR423C	YOR112W	YGR101W	YML127W	YLR133W	YML079W	YJL129C	YLL057C
##	11	11	11	11	11	11	11	11
##	YNL305C	YGR007W	YIL162W	YOL008W	YDR171W	YHR144C	YFL060C	YGR062C
##	11	11	11	11	11	11	11	11
##	YGL017W	YIR032C	YGR202C	YHR201C	YML005W	YHR070W	YGL173C	YOL148C
##	11	11	11	11	11	11	11	11
##	YKL093W	YBR015C	YPL084W	YOR008C	YDR160W	YMR039C	YBR229C	YDL207W
##	11	11	11	11	11	11	11	11
##	YIL009W	YKL089W	YMR168C	YLR045C	YDR150W	YER111C	YOR195W	YJL030W
##	11	11	11	11	11	11	11	11
##	YIR031C	YGL097W	YDR164C	YIL004C	YLR268W	YNL106C	YER015W	YBR080C
##	11	11	11	11	11	11	11	11
##	YBL050W	YBR097W	YDR495C	YGL095C	YPL155C	YGL086W	YJL013C	YPL209C
##	11	11	11	11	11	11	11	11
##	YGR238C	YBL082C	YHR010W	YPR116W	YDR369C	YGL163C	YDR217C	YBR215W
##	11	11	11	11	11	11	11	11
##	YOL068C	YOR025W	YMR224C	YNL171C	YAL026C	YLR425W	YNL289W	YMR299C
##	11	11	11	11	11	11	11	11
##	YKR047W	YIL159W	YOR058C	YDR149C	YDL117W	YLR381W	YJR053W	YDR289C
##	11	11	11	11	11	11	11	11
##	YBR095C	YBR107C	YNL170W	YHR191C	YBR231C	YNL215W	YNL307C	YML095C-A

##	11	11	11	11	11	11	11	11
##	YML016C	YCL016C	YER122C	YLR235C	YNL098C	YDR328C	YOL094C	YDR460W
##	11	11	11	11	11	12	12	12
##	YER027C	YBL056W	YKL057C	YBR125C	YGL208W	YBR087W	YML098W	YIL050W
##	12	12	12	12	12	12	12	12
##	YJR050W	YBL021C	YPR066W	YCL010C	YEL011W	YBR059C	YBR081C	YJR042W
##	12	12	12	12	12	12	12	12
##	YNL261W	YKR014C	YMR120C	YDR001C	YDR359C	YER146W	YOR244W	YIL079C
##	12	12	12	12	12	12	12	12
##	YOL090W	YNL290W	YER031C	YJL081C	YFL024C	YPL254W	YOR185C	YKR006C
##	12	12	12	12	12	12	12	12
##	YLR127C	YOR106W	YAL027W	YER089C	YGL092W	YML095C	YBR017C	YNL312W
##	12	12	12	12	12	12	12	12
##	YOR144C	YGL187C	YMR223W	YIL046W	YCR086W	YNL152W	YOR385W	YDR084C
##	12	12	12	12	12	12	12	12
##	YEL043W	YDR142C	YPR046W	YER144C	YDR408C	YGL134W	YJR102C	YJR094C
##	12	12	12	12	12	12	12	12
##	YNL086W	YER141W	YKL038W	YGL015C	YGL079W	YGL161C	YPR028W	YML008C
##	12	12	12	12	12	12	12	12
##	YLR028C	YLR211C	YCL019W	YLR345W	YLR362W	YGR071C	YKL061W	YDR479C
##	12	12	12	12	12	12	12	12
##	YGL125W	YDL165W	YHR171W	YPL149W	YLR125W	YLR030W	YLR182W	YDR113C
##	12	12	12	12	12	12	12	12
##	YFR008W	YIL144W	YDR189W	YBL102W	YIL052C	YMR077C	YOR232W	YER023W
##	12	12	12	12	12	12	12	12
##	YBR187W	YGR209C	YER056C-A	YMR316W	YIR038C	YJL176C	YER143W	YDL044C
##	12	12	12	12	12	12	12	12
##	YJR048W	YDR366C	YOR101W	YGR146C	YMR009W	YHL021C	YNR069C	YNL041C
##	12	12	12	12	12	12	12	12
##	YOR004W	YNL155W	YDR339C	YDR403W	YDR109C	YOR052C	YCL027W	YER167W
##	12	12	12	12	12	12	12	12
##	YML104C	YPL242C	YGR006W	YOR254C	YLL043W	YHR101C	YOR194C	YJL194W
##	12	12	12	12	12	12	12	12
##	YLR103C	YHR118C	YGL206C	YPR141C	YKL073W	YAL009W	YOR109W	YPR159W
##	12	12	12	12	12	12	12	12
##	YML124C	YKR086W	YMR081C	YAL030W	YBR289W	YJL148W	YML103C	YPR025C
##	12	12	12	12	12	12	12	12
##	YDR477W	YOR358W	YEL053C	YPL003W	YHL002W	YFL008W	YGR061C	YPR018W
##	12	12	12	12	12	12	12	12
##	YER136W	YDR099W	YFL009W	YGL100W	YOR217W	YML077W	YOL093W	YBR225W
##	12	12	12	12	12	12	12	12
##	YGR075C	YDL002C	YJR144W	YLR384C	YJL024C	YBR091C	YDR139C	YEL022W
##	12	12	12	12	12	12	12	12
##	YPL085W	YDL204W	YLR196W	YOL070C	YMR094W	YDL216C	YLR254C	YDR425W
##	12	12	12	12	12	12	12	12
##	YOR159C	YDR489W	YOR023C	YDR271C	YMR159C	YGL172W	YOR302W	YPL095C
##	12	12	12	12	12	12	12	12
##	YPL201C	YKR082W	YDR252W	YPL023C	YGR057C	YFL034C-B	YGR247W	YEL018W
##	12	12	12	12	12	12	12	12
##	YMR280C	YMR001C	YLR451W	YIL122W	YLR185W	YDR500C	YOR124C	YKL075C
##	12	12	12	12	12	12	12	12
##	YOR220W	YIL092W	YKL044W	YKL107W	YHR177W	YGR129W	YHR014W	YNL249C
##	12	12	12	12	12	12	12	12
##	YDL219W	YOR005C	YDR356W	YPR019W	YLR335W	YDR027C	YKL022C	YLR116W

##	12	12	12	12	12	12	12	12
##	YLR195C	YHR004C	YNL299W	YLR306W	YKL196C	YNL102W	YHR202W	YNL031C
##	12	12	12	12	12	12	12	12
##	YGR116W	YNL006W	YKL176C	YOR153W	YKL092C	YIL106W	YLR170C	YJL074C
##	12	12	12	12	12	13	13	13
##	YBR195C	YDL192W	YDL003W	YOR057W	YGL150C	YIL136W	YCR020C-A	YLR097C
##	13	13	13	13	13	13	13	13
##	YDR439W	YDR013W	YEL005C	YLR417W	YNR007C	YJL072C	YIR016W	YBL006C
##	13	13	13	13	13	13	13	13
##	YGR004W	YIL109C	YML034W	YNR068C	YJL019W	YJR110W	YML105C	YHR172W
##	13	13	13	13	13	13	13	13
##	YFR028C	YPL031C	YML065W	YML088W	YLR270W	YDR097C	YNL172W	YHR051W
##	13	13	13	13	13	13	13	13
##	YOR264W	YML014W	YPL002C	YER106W	YDR357C	YOR097C	YDR261W-B	YGR161C-C
##	13	13	13	13	13	13	13	13
##	YMR030W	YOL131W	YLR026C	YLR453C	YPL169C	YOR281C	YJR011C	YPL090C
##	13	13	13	13	13	13	13	13
##	YBR181C	YLR274W	YDR085C	YLR079W	YBL023C	YEL032W	YGL038C	YHR079C
##	13	13	13	13	13	13	13	13
##	YGL027C	YGR098C	YOR160W	YPR029C	YER059W	YPL219W	YNL216W	YBR202W
##	13	13	13	14	14	14	14	14
##	YGR092W	YGL003C	YDR320C	YDL137W	YNL161W	YBR255W	YBL078C	YAR019C
##	14	14	14	14	14	14	14	14
##	YAL024C	YPL259C	YHL019C	YFR043C	YDL224C	YKL135C	YHR152W	YPR111W
##	14	15	15	15	15	15	15	15
##	YDR146C							
##	15							

#necesito ordenarlo en forma creciente, y el comando sort no puede usarse en este objeto, por lo que t
de esta manera puedo otorgarle un número a cada nodo,
 sort(excentricidad, decreasing=FALSE)

##	YBL046W	YHR102W	YGR173W	YDR342C	YIR005W	YNL201C	YDR188W	YIL071C
##	1	1	1	1	1	1	1	1
##	YKL122C	YDL220C	YDR407C	YLR258W	YBL047C	YCL014W	YGR292W	YER162C
##	1	1	1	1	1	1	1	1
##	YFL006W	YPL208W	YJL006C	YFR021W	YBL066C	YKL019W	YLR113W	YAL023C
##	1	1	1	1	1	1	1	1
##	YMR303C	YDL042C	YOR370C	YDR395W	YDL070W	YGL058W	YNR054C	YGL008C
##	1	1	1	1	1	1	1	1
##	YEL060C	YPL193W	YDL167C	YHL006C	YNL329C	YOR212W	YKL008C	YDL084W
##	1	1	1	1	1	1	1	1
##	YHR034C	YPL133C	YMR204C	YDR520C	YNL020C	YKR007W	YCR014C	YNR039C
##	1	1	1	1	1	1	1	1
##	YML023C	YFR017C	YOR037W	YDL237W	YPL114W	YJL070C	YOR247W	YOL052C
##	1	1	1	1	1	1	1	1
##	YBR056W	YKL186C	YNL277W	YER151C	YML119W	YMR298W	YHR193C	YNL070W
##	1	1	1	1	1	1	1	1
##	YER114C	YDL229W	YPL152W	YPL218W	YDL049C	YJL054W	YMR104C	YBR082C
##	1	1	1	1	1	1	1	1
##	YLR139C	YCR034W	YPR072W	YIR033W	YHR103W	YGR080W	YNL121C	YBR170C
##	1	1	1	1	1	1	1	1
##	YDR152W	YDR343C	YGL174W	YDR075W	YOL117W	YDL092W	YMR218C	YFR015C
##	1	1	1	1	1	1	1	1

##	YCR030C	YDR405W	YBR299W	YEL037C	YFL007W	YDR361C	YML112W	YNL242W
##	1	1	1	1	1	1	1	1
##	YNL210W	YDL090C	YGL158W	YFL042C	YDR227W	YBR264C	YAL059W	YLR399C
##	1	1	1	1	1	1	1	1
##	YMR231W	YCR066W	YDR365C	YNL208W	YJR055W	YDR078C	YKL197C	YCL055W
##	1	1	1	1	1	1	1	1
##	YER063W	YCR060W	YBR239C	YJL185C	YGR241C	YFR025C	YDR205W	YER038C
##	1	1	1	1	1	1	1	1
##	YPR184W	YCL056C	YPR148C	YMR133W	YDR504C	YLR223C	YDR214W	YFR007W
##	1	1	1	1	1	1	1	1
##	YPL138C	YHL003C	YLR303W	YNR051C	YLL032C	YOR006C	YKL029C	YDL200C
##	1	1	1	1	1	1	1	1
##	YBL085W	YNL209W	YIL153W	YCR067C	YJL174W	YLR242C	YOR297C	YKL126W
##	1	1	1	1	1	1	1	1
##	YIL030C	YLR372W	YER068W	YKL020C	YDR351W	YLL050C	YMR060C	YHR005C
##	1	1	1	1	1	1	1	2
##	YGR048W	YDL126C	YLR025W	YPL049C	YBL058W	YHR119W	YHL011C	YDR049W
##	2	2	2	2	2	2	2	2
##	YDL077C	YNL258C	YGL036W	YGL192W	YBR077C	YOR275C	YKR022C	YLR148W
##	2	2	2	2	2	2	2	2
##	YPL045W	YLR396C	YPR173C	YKR094C	YIL148W	YOR092W	YBR287W	YER142C
##	2	2	2	2	2	2	2	2
##	YNL095C	YML060W	YLR152C	YGR082W	YCR048W	YNR019W	YMR106C	YDR059C
##	2	2	2	2	2	2	2	2
##	YOR045W	YOL061W	YDR490C	YNL032W	YKL189W	YOR353C	YCL028W	YDR082W
##	2	2	2	2	2	2	2	2
##	YDL095W	YMR028W	YPL036W	YBL081W	YJR086W	YKR034W	YBR246W	YGR163W
##	2	2	2	2	2	2	2	2
##	YBR212W	YJL125C	YML062C	YPR133W-A	YDR177W	YMR022W	YOR257W	YMR284W
##	2	2	2	2	2	2	2	2
##	YBL069W	YJR143C	YOR321W	YER099C	YLR015W	YNL056W	YGR086C	YNL099C
##	2	2	2	3	3	3	3	3
##	YOR043W	YPL004C	YGR040W	YDR480W	YBL068W	YOL100W	YBR175W	YGR122W
##	3	3	3	3	3	3	3	3
##	YLR440C	YBL016W	YBL010C	YMR154C	YKL181W	YGL145W	YER128W	YDR541C
##	3	3	3	3	3	3	3	3
##	YAR003W	YPL074W	YLR019W	YCR095C	YDR469W	YLL010C	YDL159W	YHR084W
##	4	4	4	4	4	4	4	4
##	YKL142W	YEL048C	YDR394W	YMR049C	YDR127W	YKL145W	YOR272W	YMR290C
##	4	4	8	8	8	8	8	8
##	YHL030W	YKL067W	YCL017C	YJL138C	YPL135W	YGL245W	YAL035W	YJR109C
##	8	8	8	8	8	8	8	8
##	YMR012W	YGR240C	YIL033C	YNL085W	YNL189W	YLR231C	YPR067W	YDR283C
##	8	8	8	8	8	8	8	8
##	YLL027W	YPR033C	YPL252C	YGL018C	YIL094C	YOR226C	YLR197W	YOR039W
##	8	8	8	8	8	8	9	9
##	YER090W	YER021W	YKL166C	YOR061W	YGL049C	YGR158C	YPR010C	YPL093W
##	9	9	9	9	9	9	9	9
##	YER006W	YFR052W	YOR261C	YHR052W	YDR280W	YGR162W	YDR101C	YOL041C
##	9	9	9	9	9	9	9	9
##	YHR197W	YLL008W	YPL043W	YOR117W	YOR310C	YNL002C	YBR126C	YKL014C
##	9	9	9	9	9	9	9	9
##	YPL012W	YPL203W	YJL203W	YLR222C	YOL077C	YFR001W	YKR081C	YDR496C
##	9	9	9	9	9	9	9	9

##	YMR205C	YDR087C	YGR145W	YOR326W	YMR309C	YDR388W	YER178W	YNL071W
##	9	9	9	9	9	9	9	9
##	YKL103C	YBR221C	YJL026W	YDL185W	YNR016C	YKL182W	YGR103W	YGL019W
##	9	9	9	9	9	9	9	9
##	YIL125W	YDL097C	YPR016C	YFL018C	YCL030C	YBR256C	YFR004W	YDL007W
##	9	9	9	9	9	9	9	9
##	YDL111C	YLR175W	YHR200W	YHR069C	YNL132W	YOR206W	YNL061W	YGR095C
##	9	9	9	9	9	9	9	9
##	YOR259C	YIL116W	YGR195W	YLR347C	YGL137W	YJR093C	YJL164C	YPR108W
##	9	9	9	9	9	9	9	9
##	YBL004W	YGR090W	YDR240C	YGL111W	YMR125W	YHR216W	YOL021C	YDL029W
##	9	9	9	9	9	9	9	9
##	YJL109C	YDL147W	YMR314W	YDL031W	YGR135W	YCR035C	YPL111W	YBR208C
##	9	9	9	9	9	9	9	9
##	YKL172W	YOR136W	YKL104C	YLR355C	YOR142W	YER174C	YCR012W	YGL011C
##	9	9	9	9	9	9	9	9
##	YKL009W	YGR245C	YGL009C	YER012W	YGL195W	YOR184W	YOR001W	YBR160W
##	9	9	9	9	9	9	9	9
##	YMR239C	YPL266W	YOR180C	YDL014W	YLR449W	YDR337W	YOR362C	YJL005W
##	9	9	9	9	9	9	9	9
##	YPL211W	YDR385W	YBR142W	YIL128W	YER126C	YER052C	YGR218W	YGR232W
##	9	9	9	9	9	9	9	9
##	YBR009C	YMR308C	YGR267C	YHR033W	YER002W	YLR421C	YOL086C	YKR002W
##	9	9	9	9	9	9	9	9
##	YAL003W	YGR234W	YIL061C	YDR036C	YOR181W	YPR191W	YLR002C	YGL207W
##	9	9	9	9	9	9	9	9
##	YGR155W	YDL134C	YHR066W	YFL002C	YMR108W	YBR272C	YMR172W	YER155C
##	9	9	9	9	9	9	9	9
##	YOR202W	YOR035C	YBR103W	YDR427W	YBR025C	YHR114W	YCL009C	YBR136W
##	9	9	9	9	9	9	9	9
##	YHR086W	YBR109C	YBL039C	YCL059C	YDR502C	YOL139C	YDR130C	YNL139C
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##	YAL038W	YER154W	YIL042C	YGL031C	YLR264W	YDR060W	YCL040W	YDR047W
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##	YOR093C	YBR222C	YLR209C	YER096W	YOR076C	YER110C	YIR027C	YCR003W
##	9	9	9	9	9	9	9	9
##	YDL052C	YCR076C	YIL154C	YOR133W	YDR196C	YNL044W	YML059C	YPL091W
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##	9	9	9	9	9	9	9	9
##	YNL072W	YDR318W	YLR342W	YEL021W	YER168C	YFR050C	YPL059W	YPL148C
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##	YDR533C	YIL035C	YOL142W	YNL316C	YOL018C	YPR113W	YDL227C	YGR276C
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##	9	9	9	9	9	9	9	9
##	YER171W	YBR243C	YNL220W	YFL033C	YLR107W	YBR166C	YDR341C	YHR032W
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##	YLL036C	YBR135W	YIL021W	YOL149W	YJL098W	YPL126W	YDL060W	YDR228C
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##	10	10	10	10	10	10	10	10
##	YGL123W	YNL284C	YML025C	YOL040C	YGR034W	YMR188C	YDL191W	YFR030W
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##	YDL136W	YGR220C	YNR037C	YOL127W	YLR340W	YFLO22C	YBL038W	YDR041W
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##	YDR091C	YOR151C	YGR013W	YMR189W	YDR301W	YKR068C	YBR055C	YAL044C
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##	10	10	10	10	10	10	10	10
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##	10	10	10	10	10	10	10	10
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##	10	10	10	10	10	10	10	10
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##	10	10	10	10	10	10	10	10
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##	10	10	10	10	10	10	10	10
##	YGR286C	YBR257W	YNR074C	YPR002W	YDL065C	YNL256W	YOR119C	YDL087C
##	10	10	10	10	10	10	10	10
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##	YMR288W	YLR022C	YDL205C	YDR235W	YNL263C	YFL001W	YMR113W	YOR274W
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##	YKR087C	YER087W	YMR178W	YNL244C	YDR296W	YHR156C	YKL194C	YDR117C
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##	YGL023C	YBR085W	YJR032W	YAL041W	YKL212W	YJL095W	YLR111W	YEL003W
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##	10	10	10	10	10	10	10	10
##	YKR024C	YDL066W	YDR028C	YDR422C	YLR074C	YLR275W	YDL213C	YML063W
##	10	10	10	10	10	10	10	10
##	YIL034C	YAR007C	YDR170C	YBR249C	YLR044C	YGR253C	YJR064W	YOR158W
##	10	10	10	10	10	10	10	10
##	YDL153C	YHR019C	YGL060W	YKL082C	YLR337C	YMR096W	YGR233C	YBR098W
##	10	10	10	10	10	10	10	10
##	YDR179C	YOL054W	YCR079W	YPR121W	YDR166C	YHR016C	YDR023W	YJL115W
##	10	10	10	10	10	10	10	10
##	YOL108C	YIL008W	YJL184W	YGR178C	YMR293C	YJR125C	YLR277C	YOR221C
##	10	10	10	10	10	10	10	10
##	YJL048C	YJL052W	YPR040W	YJR009C	YIL075C	YOL143C	YBL024W	YDR232W
##	10	10	10	10	10	10	10	10
##	YMR296C	YGR058W	YLR135W	YOR224C	YKR037C	YHR021C	YMR035W	YDR233C
##	10	10	10	10	10	10	10	10
##	YOR089C	YKL010C	YPL125W	YPL171C	YIL039W	YOR356W	YMR232W	YGR043C
##	10	10	10	10	10	10	10	10
##	YLR354C	YJR017C	YOR026W	YNL302C	YNR041C	YJL180C	YOR330C	YER014W
##	10	10	10	10	10	10	10	10
##	YLR249W	YLR263W	YMR167W	YIL007C	YPR041W	YML117W	YJR014W	YGL084C
##	10	10	10	10	10	10	10	10
##	YOL145C	YBR038W	YDR529C	YGR110W	YGR125W	YJR141W	YGL225W	YLR112W
##	10	10	10	10	10	10	10	10
##	YDL217C	YGR194C	YBR223C	YGL043W	YHR011W	YGR124W	YAR008W	YGR255C
##	10	10	10	10	10	10	10	10
##	YOR219C	YBL098W	YLR441C	YDR035W	YBL019W	YNL040W	YPR118W	YLR056W
##	10	10	10	10	10	10	10	10
##	YDR297W	YGR060W	YMR234W	YKL094W	YKL157W	YNL045W	YMR013C	YJL198W
##	10	10	10	10	10	10	10	10
##	YGL178W	YDL143W	YPR163C	YML085C	YDL017W	YBR171W	YNL084C	YIL095W
##	10	10	10	10	10	10	10	10

##	YKR042W	YAL013W	YOR216C	YLR330W	YMR235C	YLR238W	YHR115C	YDR200C
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##	YGR032W	YBR237W	YKL139W	YER172C	YHR154W	YBR021W	YGL226C-A	YDR363W
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##	YHR134W	YOR027W	YLR433C	YKL190W	YDR473C	YGL115W	YLR208W	YHR107C
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##	YNL147W	YNL118C	YNR012W	YDR298C	YML026C	YJR121W	YKL170W	YGL112C
##	11	11	11	11	11	11	11	11
##	YIL104C	YAL032C	YJL014W	YIL142W	YNL078W	YPR051W	YBR193C	YGR083C
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##	YOR304W	YJL041W	YDR378C	YNL330C	YOR174W	YLR314C	YGL234W	YKR025W
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##	YJR076C	YDL006W	YNL207W	YPR168W	YBR130C	YMR213W	YBR253W	YKL144C
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##	YDR308C	YPL181W	YGR186W	YOR056C	YEL056W	YDR416W	YAL021C	YOR150W
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##	YBL026W	YKL193C	YPL195W	YGL241W	YNL154C	YJL173C	YGR204W	YBR254C
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##	YMR139W	YER003C	YNL236W	YPR182W	YGR200C	YCL024W	YOR368W	YLR310C
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##	YLR212C	YLR229C	YIL126W	YNL311C	YAR014C	YDR021W	YBL090W	YLR398C
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##	YMR025W	YDR071C	YJR090C	YIL068C	YJR068W	YGL127C	YGL198W	YGR268C
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##	YBR217W	YER170W	YPL081W	YLR052W	YDR488C	YDR016C	YAR015W	YNR057C
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##	YOL069W	YPR083W	YKL052C	YOR065W	YOR034C	YBR227C	YOR308C	YDR277C
##	11	11	11	11	11	11	11	11
##	YPR026W	YMR143W	YDL089W	YGR223C	YNL069C	YLR287C	YIL053W	YDL083C
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##	11	11	11	11	11	11	11	11

##	YGR119C	YLR244C	YPR001W	YNR001C	YCR087C-A	YGR172C	YBL091C	YDR229W
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##	YBR252W	YPL109C	YGR188C	YGL151W	YLR167W	YGR283C	YCR081W	YPL082C
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##	YMR068W	YPR070W	YNR010W	YDR145W	YLR142W	YGL254W	YBR061C	YBR018C
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##	YHR176W	YGR113W	YLR357W	YDR527W	YER118C	YDR538W	YGL181W	YPR131C
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##	YOL039W	YNR032W	YHR210C	YCL063W	YNR073C	YER037W	YDL209C	YJL140W
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##	YNL199C	YFR002W	YKL002W	YBL022C	YIL084C	YBR020W	YNL129W	YMR130W
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##	YDR052C	YDL081C	YNL280C	YNL151C	YNR071C	YFR036W	YEL062W	YBR024W
##	11	11	11	11	11	11	11	11
##	YMR263W	YML015C	YER060W-A	YDR147W	YCR020C	YNL320W	YGR094W	YPL246C
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##	YHR029C	YLR017W	YIL155C	YOL137W	YKR080W	YGR256W	YDR293C	YEL038W
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##	YFL030W	YHR183W	YCR059C	YIR015W	YHR013C	YBR207W	YNL332W	YGL224C
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##	YJR156C	YDL244W	YKR079C	YEL024W	YNL142W	YMR114C	YDL141W	YPR138C
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##	YMR200W	YLR210W	YBR050C	YDL028C	YCL061C	YLR085C	YML115C	YDR392W
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##	YKL049C	YOR349W	YOR265W	YDR192C	YJL034W	YDR156W	YPL065W	YLR206W
##	11	11	11	11	11	11	11	11
##	YPL018W	YDR364C	YGL216W	YKL074C	YGL217C	YMR302C	YMR246W	YGR252W
##	11	11	11	11	11	11	11	11
##	YDL063C	YLL002W	YOL115W	YDR080W	YKR054C	YDR054C	YPL240C	YER105C
##	11	11	11	11	11	11	11	11

##	YDR212W	YPL241C	YBR188C	YMR109W	YER173W	YGL085W	YMR198W	YCR038C
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##	YOR290C	YGL244W	YLR071C	YNL119W	YML097C	YPL194W	YKL068W	YHR158C
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##	YGL116W	YGL124C	YER007W	YER107C	YHL027W	YPR135W	YMR307W	YGL240W
##	11	11	11	11	11	11	11	11
##	YBL103C	YNL126W	YAL040C	YNR038W	YIL002C	YMR129W	YBL051C	YOR157C
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##	YDR020C	YMR236W	YDR022C	YLR192C	YDR176W	YGR196C	YPR160W	YNL169C
##	11	11	11	11	11	11	11	11
##	YCR052W	YBR245C	YJL061W	YCR002C	YNR046W	YHR099W	YMR226C	YLL022C
##	11	11	11	11	11	11	11	11
##	YHR098C	YHR135C	YMR091C	YJR074W	YHR064C	YKL028W	YLR321C	YLR262C
##	11	11	11	11	11	11	11	11
##	YJR006W	YPR112C	YGR154C	YKL152C	YJL033W	YLL026W	YKL095W	YPL161C
##	11	11	11	11	11	11	11	11
##	YPL140C	YIL113W	YFR011C	YNL023C	YKL080W	YPR189W	YIR034C	YHR057C
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##	YGR120C	YEL041W	YMR032W	YLR126C	YOR164C	YCL032W	YGR239C	YJR135C
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##	YKR088C	YJL151C	YPL105C	YLR190W	YPL174C	YGL170C	YJL058C	YKR100C
##	11	11	11	11	11	11	11	11
##	YKL050C	YCL033C	YER071C	YDL121C	YER062C	YDR261W-A	YJL068C	YPL172C
##	11	11	11	11	11	11	11	11
##	YPL159C	YMR233W	YLR239C	YOR028C	YCR005C	YMR163C	YAR073W	YLR319C
##	11	11	11	11	11	11	11	11
##	YLR031W	YNL247W	YJR083C	YLR446W	YGR170W	YOR074C	YLR253W	YHR184W
##	11	11	11	11	11	11	11	11
##	YDR273W	YDR026C	YGR189C	YJL153C	YLR376C	YJL057C	YPR136C	YNL047C
##	11	11	11	11	11	11	11	11
##	YLR420W	YNL049C	YBR284W	YBR155W	YDL013W	YLR072W	YPR172W	YNL273W
##	11	11	11	11	11	11	11	11
##	YOR318C	YLR373C	YJR134C	YNL105W	YOR317W	YOR359W	YDR203W	YPR175W
##	11	11	11	11	11	11	11	11
##	YOR324C	YDR455C	YDL118W	YPL233W	YKL023W	YEL013W	YOL129W	YAL028W
##	11	11	11	11	11	11	11	11
##	YBR037C	YDL154W	YHL001W	YKL006W	YLR156W	YNR050C	YKL076C	YHR143W-A
##	11	11	11	11	11	11	11	11
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##	11	11	11	11	11	11	11	11
##	YHR130C	YGR121C	YHR180W	YLR059C	YER039C	YER180C	YOR289W	YMR055C
##	11	11	11	11	11	11	11	11
##	YNR043W	YNR048W	YAL060W	YDR008C	YNL042W	YMR273C	YDR034C	YOL050C
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##	YDR423C	YOR112W	YGR101W	YML127W	YLR133W	YML079W	YJL129C	YLL057C
##	11	11	11	11	11	11	11	11
##	YNL305C	YGR007W	YIL162W	YOL008W	YDR171W	YHR144C	YFL060C	YGR062C
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##	YGL017W	YIR032C	YGR202C	YHR201C	YML005W	YHR070W	YGL173C	YOL148C
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##	YKL093W	YBR015C	YPL084W	YOR008C	YDR160W	YMR039C	YBR229C	YDL207W
##	11	11	11	11	11	11	11	11

##	YIL009W	YKL089W	YMR168C	YLR045C	YDR150W	YER111C	YOR195W	YJL030W
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##	YIR031C	YGL097W	YDR164C	YIL004C	YLR268W	YNL106C	YER015W	YBR080C
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##	11	11	11	11	11	11	11	11
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##	YER027C	YBL056W	YKL057C	YBR125C	YGL208W	YBR087W	YML098W	YIL050W
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##	12	12	12	12	12	12	12	12
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##	12	12	12	12	12	12	12	12
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##	YLR103C	YHR118C	YGL206C	YPR141C	YKL073W	YAL009W	YOR109W	YPR159W
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##	YDR477W	YOR358W	YEL053C	YPL003W	YHL002W	YFL008W	YGR061C	YPR018W
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##	YER136W	YDR099W	YFL009W	YGL100W	YOR217W	YML077W	YOL093W	YBR225W
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##	YGR075C	YDL002C	YJR144W	YLR384C	YJL024C	YBR091C	YDR139C	YEL022W
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##	12	12	12	12	12	12	12	12
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##	12	12	12	12	12	12	12	12
##	YMR280C	YMR001C	YLR451W	YIL122W	YLR185W	YDR500C	YOR124C	YKL075C
##	12	12	12	12	12	12	12	12
##	YOR220W	YIL092W	YKL044W	YKL107W	YHR177W	YGR129W	YHR014W	YNL249C
##	12	12	12	12	12	12	12	12
##	YDL219W	YOR005C	YDR356W	YPR019W	YLR335W	YDR027C	YKL022C	YLR116W
##	12	12	12	12	12	12	12	12
##	YLR195C	YHR004C	YNL299W	YLR306W	YKL196C	YNL102W	YHR202W	YNL031C
##	12	12	12	12	12	12	12	12
##	YGR116W	YNL006W	YKL176C	YOR153W	YKL092C	YIL106W	YLR170C	YJL074C
##	12	12	12	12	12	13	13	13
##	YBR195C	YDL192W	YDL003W	YOR057W	YGL150C	YIL136W	YCR020C-A	YLR097C
##	13	13	13	13	13	13	13	13
##	YDR439W	YDR013W	YEL005C	YLR417W	YNR007C	YJL072C	YIR016W	YBL006C
##	13	13	13	13	13	13	13	13
##	YGR004W	YIL109C	YML034W	YNR068C	YJL019W	YJR110W	YML105C	YHR172W
##	13	13	13	13	13	13	13	13
##	YFR028C	YPL031C	YML065W	YML088W	YLR270W	YDR097C	YNL172W	YHR051W
##	13	13	13	13	13	13	13	13
##	YOR264W	YML014W	YPL002C	YER106W	YDR357C	YOR097C	YDR261W-B	YGR161C-C
##	13	13	13	13	13	13	13	13
##	YMR030W	YOL131W	YLR026C	YLR453C	YPL169C	YOR281C	YJR011C	YPL090C
##	13	13	13	13	13	13	13	13
##	YBR181C	YLR274W	YDR085C	YLR079W	YBL023C	YEL032W	YGL038C	YHR079C
##	13	13	13	13	13	13	13	13
##	YGL027C	YGR098C	YOR160W	YPR029C	YER059W	YPL219W	YNL216W	YBR202W
##	13	13	13	14	14	14	14	14
##	YGR092W	YGL003C	YDR320C	YDL137W	YNL161W	YBR255W	YBL078C	YAR019C
##	14	14	14	14	14	14	14	14
##	YAL024C	YPL259C	YHL019C	YFR043C	YDL224C	YKL135C	YHR152W	YPR111W
##	14	15	15	15	15	15	15	15
##	YDR146C							
##	15							

*#ordenar en orden creciente, ya que la excentricidad, entre más baja, indica que el nodo es más central
por excentricidad los nodos más importantes son YBL046W YHR102W YGR173W YDR342C YIR005W YNL*

*digri<-degree(yeast)# no se indica si in o out, o total, debido a que es una red no dirigida.
sort(digri, decreasing =TRUE) #se ordena de manera decreciente, porque entre mayor el valor del degree,*

##	YPR110C	YPL131W	YNL178W	YIL021W	YOL127W	YJL063C	YBR283C	YLR378C
##	118	115	114	113	113	108	108	108
##	YMR260C	YBR251W	YGL123W	YNL284C	YGL103W	YOL040C	YGR034W	YDL191W
##	107	106	106	106	106	104	104	104
##	YDL136W	YGR220C	YNR037C	YOR063W	YIL018W	YLR344W	YEL050C	YPL183W-A
##	104	104	104	104	104	104	104	102
##	YDR041W	YJR113C	YML010W	YBL038W	YLR075W	YGL068W	YHL015W	YNL189W

##	101	97	95	94	93	91	90	90
##	YJR123W	YBL004W	YDL014W	YLR175W	YBL092W	YNL132W	YDR101C	YNR016C
##	86	73	68	62	62	60	58	58
##	YIL147C	YPR010C	YJL109C	YER016W	YBR257W	YMR290C	YDL029W	YER006W
##	58	57	57	57	57	56	56	55
##	YDR496C	YGR103W	YBR084C-A	YBL027W	YKL009W	YHR203C	YJR145C	YHR052W
##	55	55	55	55	54	54	54	53
##	YPR016C	YGR090W	YBR146W	YDR237W	YNL271C	YOR116C	YPL093W	YPR187W
##	53	53	53	53	53	52	52	52
##	YOR207C	YMR310C	YGR283C	YNL002C	YPL012W	YMR049C	YNL306W	YOR341W
##	52	52	52	51	51	50	50	49
##	YGL059W	YIL042C	YML025C	YOL077C	YOR272W	YGL205W	YGL211W	YBR234C
##	48	48	47	46	46	46	45	45
##	YDR116C	YNL061W	YHR147C	YDL140C	YPL043W	YGR145W	YMR158W	YDL061C
##	44	44	44	43	43	43	43	43
##	YPR166C	YLR388W	YDR036C	YGL147C	YNL067W	YLR367W	YJL190C	YGR085C
##	43	43	42	42	42	42	42	42
##	YPR102C	YBR048W	YKL173W	YMR188C	YOR151C	YMR125W	YDR025W	YLR197W
##	42	42	42	41	41	41	41	40
##	YML026C	YKL170W	YOR206W	YDR450W	YDR012W	YNL177C	YJL177W	YKL180W
##	40	40	40	40	40	40	40	40
##	YBR031W	YER117W	YBL087C	YDR127W	YBR208C	YNL081C	YCR031C	YJL191W
##	40	40	40	39	39	39	39	39
##	YHR197W	YPL126W	YKR081C	YOR150W	YIL133C	YDR394W	YLR340W	YNL069C
##	38	38	38	38	38	37	37	37
##	YKL113C	YLR409C	YDL185W	YKL145W	YDR449C	YPL231W	YMR143W	YDL083C
##	37	36	36	36	36	36	36	36
##	YPL212C	YKL104C	YEL054C	YDR418W	YPL220W	YGL135W	YHR148W	YNL292W
##	36	35	35	35	35	35	35	35
##	YGR118W	YNL185C	YLL008W	YNR036C	YPR132W	YDL202W	YKL192C	YML049C
##	35	35	34	34	34	34	34	34
##	YFL001W	YGL063W	YDR117C	YBR247C	YDR337W	YER029C	YBR154C	YLR423C
##	34	34	34	34	33	33	32	32
##	YOR210W	YER082C	YDR324C	YER126C	YML009C	YNL244C	YPL227C	YNL110C
##	32	32	32	32	32	32	32	32
##	YHL004W	YKL014C	YDL031W	YKR060W	YPL211W	YCL059C	YKL024C	YDR226W
##	32	31	31	31	31	31	31	31
##	YER170W	YLR244C	YBL091C	YMR208W	YGR162W	YKL182W	YLR147C	YDL227C
##	31	31	31	31	30	30	30	30
##	YGL111W	YJR014W	YHL030W	YGL120C	YJR002W	YML054C	YJR008W	YPR183W
##	29	29	28	28	28	28	28	28
##	YDR162C	YMR314W	YLR129W	YNL236W	YER061C	YNL123W	YBR041W	YHR088W
##	28	27	27	27	27	27	27	27
##	YOL041C	YLL036C	YGR245C	YOR180C	YAL035W	YHR041C	YMR093W	YNL137C
##	26	26	26	26	26	26	26	26
##	YOR093C	YBR222C	YMR012W	YMR128W	YLR284C	YDR060W	YHR009C	YJR016C
##	26	26	25	25	25	25	25	25
##	YLR275W	YGL049C	YGR158C	YGL019W	YHR200W	YGR095C	YGR195W	YOL021C
##	25	24	24	24	24	24	24	24
##	YCR057C	YER012W	YBL013W	YBR029C	YDR283C	YPR033C	YIL035C	YMR190C
##	24	24	24	24	24	24	24	24
##	YOR061W	YBR193C	YER022W	YKL172W	YOR174W	YGL245W	YGR240C	YLR186W
##	23	23	23	23	23	23	23	23
##	YML064C	YNL256W	YPL151C	YOL135C	YOL051W	YLR071C	YFR052W	YLR222C

##	23	23	23	23	23	23	22	22
##	YFR004W	YKL067W	YER069W	YJR109C	YIL061C	YLR002C	YPL217C	YDR427W
##	22	22	22	22	22	22	22	22
##	YJR091C	YPL028W	YIL160C	YPR144C	YMR288W	YGR104C	YDL148C	YML007W
##	22	22	22	22	22	22	22	22
##	YEL061C	YER090W	YER021W	YOR261C	YOR117W	YDR087C	YBR055C	YIL116W
##	22	21	21	21	21	21	21	21
##	YLR117C	YDR299W	YMR112C	YDL030W	YLR449W	YNL182C	YOR335C	YDR148C
##	21	21	21	21	21	21	21	21
##	YOL120C	YGL151W	YNL301C	YCR081W	YPR070W	YNR010W	YPR178W	YDR272W
##	21	21	21	21	21	21	21	21
##	YHR058C	YOR040W	YDR443C	YJR057W	YML004C	YDR280W	YER081W	YCL030C
##	21	21	21	21	21	20	20	20
##	YDL007W	YDL111C	YHR069C	YOR259C	YPR108W	YJR007W	YOR001W	YPR168W
##	20	20	20	20	20	20	20	20
##	YIL093C	YHR114W	YNL088W	YNR033W	YER133W	YPR067W	YLL027W	YNL005C
##	20	20	20	20	20	20	20	20
##	YHR208W	YIL154C	YOL142W	YDR292C	YJR148W	YCL054W	YOR039W	YDL097C
##	20	20	20	20	20	20	19	19
##	YGR013W	YDR240C	YPR190C	YOR145C	YKL060C	YKL012W	YDL087C	YPL213W
##	19	19	19	19	19	19	19	19
##	YKL216W	YPL252C	YPL042C	YGL025C	YGR128C	YOR326W	YBR221C	YIL125W
##	19	19	19	19	19	18	18	18
##	YLR447C	YDL147W	YBR160W	YPL266W	YKL144C	YKR002W	YFL002C	YER155C
##	18	18	18	18	18	18	18	18
##	YMR024W	YMR262W	YBL055C	YAL054C	YBR115C	YNL168C	YHR206W	YFL033C
##	18	18	18	18	18	18	18	18
##	YLR006C	YJR017C	YNL113W	YGR091W	YMR047C	YER052C	YNL075W	YLL011W
##	18	18	17	17	17	17	17	17
##	YJL130C	YLR424W	YDR454C	YOL023W	YNL026W	YMR300C	YER110C	YJR070C
##	17	17	17	17	17	17	17	17
##	YJL020C	YLR276C	YGL048C	YMR061W	YJL203W	YER178W	YNL071W	YGL112C
##	17	17	17	16	16	16	16	16
##	YFL018C	YCL017C	YJR093C	YLR355C	YLR153C	YDR308C	YDR416W	YML022W
##	16	16	16	16	16	16	16	16
##	YDL051W	YBL026W	YCL009C	YLR106C	YHR026W	YDR064W	YLR231C	YPL234C
##	16	16	16	16	16	16	16	16
##	YGR214W	YLR048W	YPL214C	YHR189W	YJL218W	YNR053C	YDR235W	YEL021W
##	16	16	16	16	16	16	16	16
##	YPL148C	YPR113W	YDR441C	YGR193C	YOR221C	YGR194C	YGL026C	YFR001W
##	16	16	16	16	16	16	15	15
##	YLR347C	YJL138C	YNR003C	YGL011C	YGR263C	YHR018C	YBR253W	YDR140W
##	15	15	15	15	15	15	15	15
##	YHR030C	YER127W	YDL239C	YDR007W	YLR115W	YAL043C	YEL027W	Q0130
##	15	15	15	15	15	15	15	15
##	YPL017C	YOL066C	YNR074C	YHL016C	YPL091W	YLR180W	YNL072W	YML094W
##	15	15	15	15	15	15	15	15
##	YER050C	YLR058C	YBR088C	YDR428C	YDL142C	YDL209C	YOL060C	YLR277C
##	15	15	15	15	15	15	15	15
##	YOR224C	YOR260W	YER094C	YDR301W	YDR211W	YOR362C	YBR142W	YLR421C
##	15	14	14	14	14	14	14	14
##	YKL003C	YLL041C	YOR111W	YNL063W	YKL018W	YNL317W	YGR156W	Q0045
##	14	14	14	14	14	14	14	14
##	Q0250	YKL059C	YOR308C	YML046W	YEL058W	YBR119W	YDL238C	YBR281C

##	14	14	14	14	14	14	14	14
##	YMR278W	YLR298C	YMR240C	YJR069C	YPR043W	YKR038C	YDL104C	YBR263W
##	14	14	14	14	14	14	14	14
##	YJR137C	YIL094C	YHR062C	YDR129C	YJL069C	YKR048C	YBR248C	YOR332W
##	14	14	14	14	14	14	14	13
##	YLR291C	YOR310C	YDR448W	YDR158W	YBR127C	YDR195W	YGR135W	YCR035C
##	13	13	13	13	13	13	13	13
##	YML092C	YBR081C	YBR218C	YCR046C	YLR029C	YHR066W	YFR044C	YHR170W
##	13	13	13	13	13	13	13	13
##	YPL013C	YLR200W	YKL099C	YHR086W	YDR502C	YPR103W	YHR111W	YHR038W
##	13	13	13	13	13	13	13	13
##	YBR189W	YPL081W	YPR060C	YKR001C	YOR285W	YNR058W	Q0275	YNL232W
##	13	13	13	13	13	13	13	13
##	YPR107C	YCR003W	YOR274W	YGR244C	YGR021W	YJL121C	YGR084C	YDR347W
##	13	13	13	13	13	13	13	13
##	YDR404C	YPL118W	YGL236C	YKL155C	YOR131C	YGL129C	YNL073W	YMR121C
##	13	13	13	13	13	13	13	13
##	YPL069C	YDR037W	YNL220W	YJL172W	YLR009W	YGL105W	YOL149W	YMR309C
##	13	13	13	13	13	13	12	12
##	YDR298C	YJR121W	YAL032C	YGR020C	YOL038W	YFR037C	YGL195W	YJL005W
##	12	12	12	12	12	12	12	12
##	YGR232W	YGR267C	YER002W	YIL033C	YOL139C	YBR039W	YDL004W	YBL099W
##	12	12	12	12	12	12	12	12
##	YPR024W	YLR289W	YGL030W	YDR322W	YOR076C	YLR022C	YDR018C	YIR042C
##	12	12	12	12	12	12	12	12
##	YDL043C	YNL222W	YKR009C	YPR073C	YBR003W	YJL167W	YER171W	YCL004W
##	12	12	12	12	12	12	12	12
##	YJL046W	YDR364C	YGR252W	YEL051W	YHR020W	YBR042C	YDR328C	YLR208W
##	12	12	12	12	12	12	11	11
##	YDL160C	YDL116W	YDL060W	YDR388W	YPL135W	YJL088W	YOR142W	YGL009C
##	11	11	11	11	11	11	11	11
##	YMR239C	YBL041W	YNL262W	YGR218W	YOL004W	YCR053W	YBR200W	YMR229C
##	11	11	11	11	11	11	11	11
##	YDL100C	YDL226C	YEL015W	YCR028C-A	YER017C	YHR025W	YDL168W	YDR236C
##	11	11	11	11	11	11	11	11
##	YJR047C	YMR294W	YIR027C	YDL052C	YGR278W	YLR439W	YMR178W	YKL184W
##	11	11	11	11	11	11	11	11
##	YGR112W	YNL218W	YLR143W	YKR031C	YOL005C	YMR089C	YEL034W	YDR175C
##	11	11	11	11	11	11	11	11
##	YDL213C	YOR226C	YOR286W	YCR077C	YKR068C	YGL137W	YPL111W	YCR012W
##	11	11	11	10	10	10	10	10
##	YDL047W	YKR025W	YJR063W	YIL078W	YKL143W	YJL001W	YLR438W	YGL207W
##	10	10	10	10	10	10	10	10
##	YHR196W	YOR202W	YPL198W	YOR047C	YMR286W	YGL076C	Q0085	YPR004C
##	10	10	10	10	10	10	10	10
##	YBL080C	YBR002C	YMR101C	YDL193W	YER095W	YOR065W	YBR198C	YHR129C
##	10	10	10	10	10	10	10	10
##	YOR196C	YOR236W	YGL037C	YMR074C	YGR207C	YPL082C	YOR241W	YDL150W
##	10	10	10	10	10	10	10	10
##	YMR113W	YOL121C	YJR024C	YGL062W	YGR274C	YJL189W	YGL018C	YPR101W
##	10	10	10	10	10	10	10	10
##	YKL194C	YKL151C	YJR117W	YPL178W	YCR072C	YMR242C	YOR312C	YML015C
##	10	10	10	10	10	10	10	10
##	YGR074W	YHR106W	YGL169W	YDR076W	YJR139C	YDR353W	YER057C	YPL008W

##	10	10	10	10	10	10	10	10
##	YKL132C	YEL024W	YIL051C	YBR288C	YAL040C	YMR236W	YPL237W	YNL248C
##	10	10	10	10	10	10	10	10
##	YGR253C	YOL143C	YNL302C	YDR473C	YER112W	YLR166C	YMR205C	YPR167C
##	10	10	10	9	9	9	9	9
##	YGL190C	YDL145C	YOR136W	YKR069W	YNL104C	YBR009C	YGL171W	YPR191W
##	9	9	9	9	9	9	9	9
##	YGR155W	YDR167W	YAL033W	YLR288C	YDR311W	YBR025C	YDR074W	YBL007C
##	9	9	9	9	9	9	9	9
##	YGL127C	YMR118C	YKL141W	YOR128C	YGR180C	YCR036W	YGL143C	YIL103W
##	9	9	9	9	9	9	9	9
##	YOR278W	YDL045C	YIR022W	YDL182W	YLR406C	YML110C	YER074W	YIL069C
##	9	9	9	9	9	9	9	9
##	YKL211C	YLR328W	YDL075W	YDR145W	YDR196C	YGL128C	YMR287C	YDR462W
##	9	9	9	9	9	9	9	9
##	YGL091C	YLR281C	YLR359W	YBR019C	YOL114C	YMR315W	YNL151C	YIL003W
##	9	9	9	9	9	9	9	9
##	YKL191W	YML051W	YDR293C	YBR196C	YBL105C	YDR054C	YOL140W	YMR193W
##	9	9	9	9	9	9	9	8
##	YHR107C	YOL058W	YNL287W	YDL188C	YKR026C	YGL234W	YPL139C	YJR042W
##	8	8	8	8	8	8	8	8
##	YGR186W	YPL204W	YOL086C	YGR204W	YNL085W	YBR103W	YLL018C	YFL045C
##	8	8	8	8	8	8	8	8
##	YOR167C	YBR153W	YGR010W	YDR242W	Q0105	YGL221C	YHR168W	YBR176W
##	8	8	8	8	8	8	8	8
##	YAR015W	YNL162W	YHR141C	YHL032C	YOR108W	YBR270C	YGR019W	YML106W
##	8	8	8	8	8	8	8	8
##	YER157W	YMR271C	YDL055C	YNL241C	YML059C	YDL205C	YGR113W	YFR050C
##	8	8	8	8	8	8	8	8
##	YKR087C	YER087W	YDR004W	YCR019W	YJR105W	YER179W	YOR209C	YPR035W
##	8	8	8	8	8	8	8	8
##	YBR084W	YDR539W	YJL092W	YMR084W	YDL131W	YOR168W	YOL033W	YKL156W
##	8	8	8	8	8	8	8	8
##	YOR122C	YBR245C	YDR432W	YLR074C	YGR120C	YMR293C	YHR021C	YOL148C
##	8	8	8	8	8	8	8	8
##	YMR146C	YJL124C	YJL098W	YNL147W	YFR040W	YNL118C	YFL022C	YNR012W
##	7	7	7	7	7	7	7	7
##	YCL010C	YAL044C	YBL033C	YGR083C	YER025W	YFR051C	YGR262C	YDR378C
##	7	7	7	7	7	7	7	7
##	YIL076W	YOR184W	YGL070C	YJR111C	YFL038C	YDL134C	YBR272C	YDL132W
##	7	7	7	7	7	7	7	7
##	YNL112W	YLR212C	YOL006C	YIL126W	YOR323C	YJR068W	YMR217W	YDR510W
##	7	7	7	7	7	7	7	7
##	YDR115W	YDR259C	YMR267W	YPL124W	YIL020C	YPR088C	YLR295C	YMR153W
##	7	7	7	7	7	7	7	7
##	YMR150C	YER055C	YAL038W	YER154W	YLR264W	YDR086C	YPR074C	YBR117C
##	7	7	7	7	7	7	7	7
##	YDR050C	YNL092W	YGR231C	YPR082C	YGL148W	YKL040C	YLR342W	YER168C
##	7	7	7	7	7	7	7	7
##	YGR132C	YPR086W	YGR276C	YML021C	YHR046C	YOR014W	YIL084C	YDR287W
##	7	7	7	7	7	7	7	7
##	YOL071W	YPL160W	YGR012W	YFL030W	YMR090W	YJR149W	YER004W	YLR107W
##	7	7	7	7	7	7	7	7
##	YBR166C	YDR341C	YIL074C	YGL094C	YOL126C	YOL080C	YJR060W	YFL005W

##	7	7	7	7	7	7	7	7
##	YCL029C	YKR054C	YFL039C	YKR028W	YGL044C	YOL082W	YDR238C	YGR061C
##	7	7	7	7	7	7	7	7
##	YOR158W	YJL187C	YMR035W	YOR347C	YHR091C	YOR095C	YBL019W	YML085C
##	7	7	7	7	7	7	7	7
##	YIL106W	YIL062C	YGL220W	YLR370C	YKL057C	YGL122C	YDR228C	YDL225W
##	6	6	6	6	6	6	6	6
##	YFR030W	YDR354W	YJL026W	YJL014W	YBR256C	YOR270C	YNR035C	YAL016W
##	6	6	6	6	6	6	6	6
##	YJR065C	YBR079C	YOR304W	YCR093W	YKL013C	YBL002W	YKL001C	YMR213W
##	6	6	6	6	6	6	6	6
##	YDR385W	YMR116C	YPR137W	YGL099W	YPL254W	YKR067W	YMR172W	YMR268C
##	6	6	6	6	6	6	6	6
##	YHR059W	YBL039C	YGL092W	YNL016W	YMR223W	YPR047W	YLR245C	YLR060W
##	6	6	6	6	6	6	6	6
##	YFL059W	YCL018W	YOR303W	YML125C	YDR487C	YDR408C	YMR054W	YGR144W
##	6	6	6	6	6	6	6	6
##	YOR361C	YGR210C	YNL122C	YDL235C	YHL014C	YGR286C	YPR002W	YGL031C
##	6	6	6	6	6	6	6	6
##	YDL112W	YOR201C	YLR167W	YPL070W	YOR133W	YGL133W	YPL011C	YGR005C
##	6	6	6	6	6	6	6	6
##	YDR336W	YMR023C	YKR072C	YJL140W	YMR263W	YGR175C	YAL062W	YDL201W
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##	YGR169C	YDL174C	YDL178W	YEL071W	YBL061C	YLR011W	YDL036C	YLR382C
##	6	6	6	6	6	6	6	6
##	YOL095C	YLR308W	YDL078C	YDL141W	YLR165C	YLR307W	YBR023C	YGL252C
##	6	6	6	6	6	6	6	6
##	YBR011C	YKL085W	YJL095W	YEL003W	YGR092W	YOR290C	YDL102W	YNL079C
##	6	6	6	6	6	6	6	6
##	YGR078C	YNL153C	YPL235W	YER070W	YKL081W	YIL034C	YHR019C	YOR089C
##	6	6	6	6	6	6	6	6
##	YPL172C	YGR101W	YGR255C	YBL098W	YML086C	YLL057C	YDL143W	YPR029C
##	6	6	6	6	6	6	6	5
##	YGL115W	YOL094C	YBL045C	YBR126C	YGL237C	YBR135W	YIR001C	YKL103C
##	5	5	5	5	5	5	5	5
##	YIL142W	YLR025W	YNL330C	YGL156W	YPL181W	YMR199W	YER177W	YMR120C
##	5	5	5	5	5	5	5	5
##	YPL256C	YIL128W	YGL197W	YMR308C	YHR024C	YBR060C	YDR381W	YGR234W
##	5	5	5	5	5	5	5	5
##	YOR181W	YGR161C	YGR200C	YLR310C	YDR300C	YDL098C	YIL070C	YOR035C
##	5	5	5	5	5	5	5	5
##	YPL258C	YML069W	YJR104C	YGL198W	YCR086W	YJR049C	YNL200C	YGL153W
##	5	5	5	5	5	5	5	5
##	YIL066C	YJL093C	YDR429C	YNR057C	YDR062W	YNL086W	YPR026W	YDL089W
##	5	5	5	5	5	5	5	5
##	YDR264C	YGR148C	YLR028C	YDL203C	YGR134W	YJR010W	YBL076C	YKL150W
##	5	5	5	5	5	5	5	5
##	YBR252W	YIL043C	YBR018C	YBR213W	YLR357W	YAL046C	YPL059W	YDR296W
##	5	5	5	5	5	5	5	5
##	YNL316C	YEL070W	YOL059W	YPL010W	YNL288W	YPL132W	YLR386W	YHR210C
##	5	5	5	5	5	5	5	5
##	YNR073C	YER037W	YDL022W	YKL002W	YMR130W	YFR009W	YDL081C	YNR071C
##	5	5	5	5	5	5	5	5
##	YMR009W	YNL030W	YDR147W	YBR094W	YDR268W	YDR111C	YGR094W	YPL246C

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##	YOL097C	YJL060W	YEL038W	YPL279C	YOR390W	YNL037C	YLR089C	YGL224C
##	5	5	5	5	5	5	5	5
##	YOR375C	YPL206C	YHR032W	YBR053C	YPL110C	YDR338C	YHR128W	YER183C
##	5	5	5	5	5	5	5	5
##	YLR163C	YGL154C	YKR059W	YPL016W	YAL041W	YER125W	YDR389W	YOR265W
##	5	5	5	5	5	5	5	5
##	YFL037W	YHR118C	YOR098C	YLR234W	YDR212W	YER173W	YPL269W	YHR158C
##	5	5	5	5	5	5	5	5
##	YER107C	YJL061W	YGL106W	YNR052C	YHR099W	YGL100W	YBR249C	YDL153C
##	5	5	5	5	5	5	5	5
##	YLR337C	YDR023W	YEL041W	YDR489W	YDR232W	YMR296C	YKR037C	YOR356W
##	5	5	5	5	5	5	5	5
##	YML087C	YOL145C	YOL064C	YLR133W	YGR062C	YNL243W	YDL207W	YBR087W
##	5	5	5	5	5	5	5	4
##	YNL078W	YPR051W	YJL041W	YER174C	YLR314C	YJR076C	YNL207W	YAL021C
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##	YHR166C	YDR359C	YHR033W	YOR244W	YPR181C	YJL081C	YKL007W	YGL241W
##	4	4	4	4	4	4	4	4
##	YFL024C	YJR022W	YPR023C	YJL080C	YKL218C	YJR043C	YML109W	YHR169W
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##	4	4	4	4	4	4	4	4
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##	4	4	4	4	4	4	4	4
##	YBR295W	YML126C	YIL145C	YGR119C	YDL065C	YOR119C	YDR047W	YCR009C
##	4	4	4	4	4	4	4	4
##	YHR042W	YER091C	YOR327C	YPR048W	YNL251C	YBR061C	YMR048W	YLR035C
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##	YFR047C	YOR004W	YOR137C	YHR028C	YOL043C	YKR080W	YMR177W	YHR012W
##	4	4	4	4	4	4	4	4
##	YHL022C	YOR171C	YBR243C	YLR361C	YDR339C	YML075C	YHR179W	YAL015C
##	4	4	4	4	4	4	4	4
##	YKR079C	YCR024C	YNL011C	YOL123W	YGL213C	YHR089C	YBL079W	YKL079W
##	4	4	4	4	4	4	4	4
##	YGR208W	YIR006C	YJL194W	YGL206C	YPR141C	YGL216W	YOL115W	YER105C
##	4	4	4	4	4	4	4	4
##	YAL009W	YNL298W	YDL020C	YNL064C	YDR138W	YNL272C	YIR008C	YDR098C
##	4	4	4	4	4	4	4	4
##	YPR055W	YDL155W	YDR020C	YPL031C	YDR176W	YBR170C	YCR002C	YFL009W
##	4	4	4	4	4	4	4	4
##	YOR217W	YDR028C	YML063W	YPR112C	YOR227W	YPL161C	YMR094W	YPR121W
##	4	4	4	4	4	4	4	4
##	YMR231W	YMR032W	YDR425W	YEL047C	YPL174C	YBL024W	YPL104W	YNL247W
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##	YPL171C	YPL040C	YOR026W	YMR167W	YML117W	YHL001W	YKL006W	YBR038W

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##	YPL224C	YDL219W	YMR234W	YGL178W	YGL173C	YPL084W	YLR330W	YDR150W
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##	YER027C	YPL203W	YGL208W	YNL099C	YML098W	YGR264C	YDR091C	YHR102W
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##	YBR260C	YDL126C	YHR216W	YER026C	YOR250C	YBR059C	YER086W	YAL029C
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##	YNL154C	YPL001W	YDR472W	YBL058W	YBR282W	YDR507C	YMR139W	YMR108W
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##	YHR085W	YDL195W	YIL063C	YLR371W	YNL139C	YML032C	YHR023W	YBL090W
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##	YBR137W	YIL053W	YOL055C	YGL079W	YGL161C	YPR028W	YGR172C	YGR188C
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##	YBL022C	YIL167W	YBR191W	YLR418C	YBR024W	YNR069C	YNL041C	YDL033C
##	3	3	3	3	3	3	3	3
##	YNL192W	YPR201W	YLR401C	YLR405W	YBR121C	YPR081C	YML096W	YCR059C
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##	YHR013C	YNL155W	YLR105C	YPL079W	YNR015W	YLR174W	YML080W	YLR109W
##	3	3	3	3	3	3	3	3
##	YNL142W	YDL166C	YLR450W	YPR145W	YPR138C	YLR260W	YKR050W	YJR103W
##	3	3	3	3	3	3	3	3
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##	YDR392W	YOR349W	YNL070W	YJL034W	YDR156W	YLR103C	YKL205W	YKL074C
##	3	3	3	3	3	3	3	3
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##	3	3	3	3	3	3	3	3
##	YGR229C	YGR140W	YKL048C	YFR019W	YER007W	YJR075W	YEL029C	YNL126W
##	3	3	3	3	3	3	3	3
##	YIL002C	YLR305C	YML103C	YKL135C	YDR477W	YOR358W	YGR250C	YOL061W
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##	3	3	3	3	3	3	3	3
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##	3	3	3	3	3	3	3	3
##	YBR229C	YMR235C	YLR079W	YBR237W	YJL030W	YOL076W	YHR004C	YLR268W
##	3	3	3	3	3	3	3	3
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##	2	2	2	2	2	2	2	2
##	YLR432W	YCR033W	YNL201C	YOR056C	YEL056W	YML102W	YDR188W	YDR001C
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##	YER146W	YPR054W	YPL004C	YAL003W	YOL090W	YDL003W	YPL195W	YJL173C
##	2	2	2	2	2	2	2	2
##	YBR254C	YKR085C	YLR352W	YER093C	YPR182W	YDR225W	YOR368W	YOR204W
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##	YAL012W	YGR150C	YOR329C	YOL010W	YBR136W	YGL130W	YHR119W	YEL055C
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##	YCR082W	YOR212W	YOR020C	YEL005C	YKL008C	YDL139C	YGL134W	YHR113W
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##	YNR007C	YMR124W	YBR228W	YIR016W	YNL259C	YEL066W	YDR453C	YCL020W
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##	2	2	2	2	2	2	2	2
##	YKL061W	YMR068W	YHR171W	YLR125W	YLR182W	YOR059C	YNL263C	YKR022C
##	2	2	2	2	2	2	2	2
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##	2	2	2	2	2	2	2	2
##	YER023W	YER148W	YPR003C	YBR065C	YDR121W	YLR092W	YML042W	YGL250W
##	2	2	2	2	2	2	2	2
##	YER056C-A	YDR382W	YML101C	YPL189W	YDR045C	YOL039W	YNR032W	YJR077C
##	2	2	2	2	2	2	2	2
##	YHR074W	YBR294W	YFR002W	YMR298W	YDR505C	YER060W-A	YDL164C	YLR017W
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##	YPR019W	YBR171W	YNL084C	YLR274W	YKL089W	YHR152W	YGR032W	YKL022C
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##	1	1	1	1	1	1	1	1
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##	1	1	1	1	1	1	1	1
##	YIL079C	YKL056C	YKL193C	YDR407C	YLR258W	YOR057W	YBL047C	YOR185C
##	1	1	1	1	1	1	1	1
##	YCL024W	YKR006C	YAR003W	YCL014W	YGR292W	YER162C	YDR412W	YFL006W
##	1	1	1	1	1	1	1	1
##	YPL208W	YJL006C	YPL074W	YGL150C	YFR021W	YBL066C	YKL019W	YLR113W
##	1	1	1	1	1	1	1	1
##	YMR303C	YDL042C	YOR106W	YOR276W	YIL136W	YBR143C	YAL027W	YOR110W

##	1	1	1	1	1	1	1	1
##	YCR020C-A	YER089C	YOR370C	YDR395W	YML095C	YLR304C	YBR133C	YAR014C
##	1	1	1	1	1	1	1	1
##	YDR021W	YLR097C	YDL070W	YDL077C	YGL058W	YNR054C	YEL060C	YPL193W
##	1	1	1	1	1	1	1	1
##	YDR256C	YDR439W	YHL006C	YNL152W	YOR385W	YFR043C	YNL329C	YHR060W
##	1	1	1	1	1	1	1	1
##	YML031W	YHR121W	YEL043W	YDR142C	YHL018W	YDR013W	YJL039C	YLR019W
##	1	1	1	1	1	1	1	1
##	YGL036W	YDR446W	YJR094C	YDL084W	YPR083W	YJL072C	YHR034C	YKL052C
##	1	1	1	1	1	1	1	1
##	YOR034C	YPL133C	YMR204C	YGL192W	YDR277C	YGR223C	YER141W	YBL006C
##	1	1	1	1	1	1	1	1
##	YBR077C	YGR165W	YKL038W	YNL331C	YPR001W	YGL015C	YNL020C	YNR001C
##	1	1	1	1	1	1	1	1
##	YGR004W	YCR087C-A	YLR049C	YCR014C	YCL040W	YOR102W	YLR211C	YML056C
##	1	1	1	1	1	1	1	1
##	YPL088W	YNR039C	YIL109C	YML023C	YGL166W	YGL053W	YGL119W	YML034W
##	1	1	1	1	1	1	1	1
##	YFR017C	YGR071C	YDR479C	YJL086C	YPL109C	YCR095C	YGL125W	YDL165W
##	1	1	1	1	1	1	1	1
##	YML037C	YLR142W	YGL254W	YNR068C	YKL043W	YJL019W	YCR076C	YPL149W
##	1	1	1	1	1	1	1	1
##	YLR030W	YOR037W	YGR066C	YDL218W	YDL237W	YBL068W	YDR100W	YOR243C
##	1	1	1	1	1	1	1	1
##	YDR383C	YPL219W	YDL224C	YDR527W	YPL114W	YDR105C	YDR533C	YJL070C
##	1	1	1	1	1	1	1	1
##	YHR156C	YOR247W	YKR099W	YJR110W	YPR106W	YOL052C	YOR232W	YOR115C
##	1	1	1	1	1	1	1	1
##	YBR187W	YBR056W	YJR097W	YKL186C	YGR209C	YPR126C	YJR133W	YHL009C
##	1	1	1	1	1	1	1	1
##	YKL035W	YLR118C	YMR316W	YNL277W	YLR267W	YMR270C	YIR038C	YJL176C
##	1	1	1	1	1	1	1	1
##	YGL189C	YNL054W-B	YER143W	YGR081C	YER151C	YDL044C	YCL063W	YJR048W
##	1	1	1	1	1	1	1	1
##	YNL199C	YML119W	YDR366C	YJR056C	YDR052C	YNL216W	YOR101W	YGR146C
##	1	1	1	1	1	1	1	1
##	YNL280C	YJR159W	YEL062W	YHL021C	YKR094C	YIL148W	YCR020C	YNL320W
##	1	1	1	1	1	1	1	1
##	YDR044W	YHR029C	YLR177W	YOR092W	YBR287W	YOL137W	YHR047C	YER078C
##	1	1	1	1	1	1	1	1
##	YER142C	YBR207W	YNL095C	YML105C	YDR403W	YCR037C	YML060W	YFR006W
##	1	1	1	1	1	1	1	1
##	YLR152C	YOR311C	YNR013C	YLL029W	YDR109C	YER145C	YOR143C	YIL137C
##	1	1	1	1	1	1	1	1
##	YKL106W	YGR070W	YML055W	YMR138W	YNL117W	YHR172W	YLR216C	YJR010C-A
##	1	1	1	1	1	1	1	1
##	YOR182C	YCL027W	YER167W	YML104C	YOR033C	YGR082W	YBR202W	YOL100W
##	1	1	1	1	1	1	1	1
##	YGR006W	YBR050C	YOR254C	YDL028C	YLL043W	YCL061C	YLR085C	YML115C
##	1	1	1	1	1	1	1	1
##	YKL049C	YER114C	YMR149W	YPL065W	YLR206W	YER165W	YOR103C	YMR302C
##	1	1	1	1	1	1	1	1
##	YDL063C	YDL101C	YLL002W	YDR080W	YPL240C	YDR320C	YDL229W	YPL152W

##	1	1	1	1	1	1	1	1
##	YPL218W	YDL049C	YCR048W	YJR040W	YJL002C	YJL054W	YMR104C	YBR188C
##	1	1	1	1	1	1	1	1
##	YNR019W	YMR109W	YMR198W	YCR038C	YGL244W	YNL119W	YLR139C	YML097C
##	1	1	1	1	1	1	1	1
##	YMR106C	YAL020C	YDR323C	YOR085W	YGL116W	YGL124C	YHL027W	YPR135W
##	1	1	1	1	1	1	1	1
##	YGL073W	YBL103C	YDR059C	YKR086W	YOR045W	YMR081C	YAL030W	YCR034W
##	1	1	1	1	1	1	1	1
##	YNR038W	YPR072W	YJL148W	YNL116W	YIR033W	YHR103W	YHR031C	YGR080W
##	1	1	1	1	1	1	1	1
##	YBL051C	YNL121C	YOR157C	YDR469W	YDR022C	YLR192C	YKL189W	YGR196C
##	1	1	1	1	1	1	1	1
##	YHL002W	YOR353C	YNL169C	YDR152W	YDR343C	YGL174W	YDL137W	YNR046W
##	1	1	1	1	1	1	1	1
##	YML065W	YCL028W	YML088W	YLR270W	YOL117W	YLL010C	YDL092W	YDR097C
##	1	1	1	1	1	1	1	1
##	YDR082W	YMR218C	YFR015C	YDR170C	YML077W	YOL093W	YCR030C	YKL028W
##	1	1	1	1	1	1	1	1
##	YDR405W	YGR075C	YBR299W	YEL037C	YFL007W	YDR361C	YNL172W	YML112W
##	1	1	1	1	1	1	1	1
##	YGL060W	YKL082C	YNL242W	YNL210W	YDL090C	YAL036C	YGL158W	YDL095W
##	1	1	1	1	1	1	1	1
##	YFL042C	YDR227W	YJL024C	YBR091C	YGR154C	YKL152C	YEL022W	YPL085W
##	1	1	1	1	1	1	1	1
##	YJL033W	YMR028W	YLL026W	YLR196W	YOL054W	YOL070C	YBR264C	YCR079W
##	1	1	1	1	1	1	1	1
##	YPL140C	YIL113W	YAL059W	YFR011C	YLR399C	YHR016C	YDL159W	YNL023C
##	1	1	1	1	1	1	1	1
##	YHR051W	YHR084W	YCR066W	YDL216C	YDR365C	YPL036W	YOL108C	YNL208W
##	1	1	1	1	1	1	1	1
##	YJR055W	YBL081W	YOR264W	YIL008W	YHR057C	YLR254C	YDR078C	YLR126C
##	1	1	1	1	1	1	1	1
##	YJL184W	YGR122W	YKL197C	YOR159C	YKR088C	YJL151C	YLR440C	YJR125C
##	1	1	1	1	1	1	1	1
##	YOR023C	YJR086W	YML014W	YJL048C	YDR271C	YER106W	YGL170C	YKR100C
##	1	1	1	1	1	1	1	1
##	YER063W	YCR060W	YBR239C	YKL050C	YCL033C	YJL185C	YBR255W	YDL121C
##	1	1	1	1	1	1	1	1
##	YJL068C	YKL142W	YMR233W	YKR034W	YLR239C	YOR028C	YCR005C	YMR163C
##	1	1	1	1	1	1	1	1
##	YAR073W	YOR302W	YKL010C	YBR246W	YPL125W	YGR241C	YDR357C	YLR031W
##	1	1	1	1	1	1	1	1
##	YGR163W	YOR097C	YFR025C	YJR083C	YPL201C	YDR261W-B	YGR170W	YGR161C-C
##	1	1	1	1	1	1	1	1
##	YKR082W	YOR074C	YIL039W	YLR253W	YHR184W	YDR273W	YDR026C	YDR205W
##	1	1	1	1	1	1	1	1
##	YDR252W	YGR189C	YPL023C	YJL153C	YER038C	YLR376C	YJL057C	YGR247W
##	1	1	1	1	1	1	1	1
##	YPR136C	YLR420W	YPR184W	YBL078C	YEL018W	YNL049C	YBR284W	YBR155W
##	1	1	1	1	1	1	1	1
##	YDL013W	YLR072W	YPR172W	YJL180C	YNL273W	YMR280C	YOR318C	YMR030W
##	1	1	1	1	1	1	1	1
##	YCL056C	YOR330C	YEL048C	YOL131W	YLR451W	YPR148C	YLR263W	YBL010C

##	1	1	1	1	1	1	1	1
##	YJR134C	YNL105W	YMR154C	YOR359W	YDR203W	YOR324C	YDR455C	YDL118W
##	1	1	1	1	1	1	1	1
##	YMR133W	YIL122W	YPL233W	YIL007C	YLR185W	YDR500C	YKL023W	YEL013W
##	1	1	1	1	1	1	1	1
##	YOL129W	YLR026C	YAL028W	YDR504C	YDL154W	YLR156W	YLR223C	YNR050C
##	1	1	1	1	1	1	1	1
##	YDR214W	YKL076C	YOR124C	YKL075C	YKL181W	YHR143W-A	YDL088C	YMR067C
##	1	1	1	1	1	1	1	1
##	YBR212W	YOR281C	YFR007W	YDR529C	YPL138C	YGR110W	YLR005W	YDR005C
##	1	1	1	1	1	1	1	1
##	YGL145W	YER128W	YGL225W	YLR112W	YDR194C	YGR185C	YHR130C	YLR303W
##	1	1	1	1	1	1	1	1
##	YDL217C	YHR180W	YDR541C	YLR059C	YER039C	YER180C	YOR289W	YNR048W
##	1	1	1	1	1	1	1	1
##	YAL060W	YNR051C	YBR223C	YOR220W	YIL092W	YDR008C	YNL042W	YLL032C
##	1	1	1	1	1	1	1	1
##	YMR273C	YKL044W	YOL050C	YKL107W	YDR423C	YOR112W	YHR177W	YJR011C
##	1	1	1	1	1	1	1	1
##	YHR014W	YML127W	YPR118W	YNL249C	YLR056W	YDR297W	YGR060W	YGR007W
##	1	1	1	1	1	1	1	1
##	YJL125C	YOL008W	YDR171W	YHR144C	YFL060C	YKL157W	YNL045W	YGL017W
##	1	1	1	1	1	1	1	1
##	YOR005C	YGR202C	YHR201C	YML005W	YHR070W	YMR013C	YJL198W	YPR163C
##	1	1	1	1	1	1	1	1
##	YOR008C	YDR160W	YML062C	YLR335W	YIL095W	YKR042W	YMR039C	YAL013W
##	1	1	1	1	1	1	1	1
##	YAL024C	YIL009W	YDR085C	YMR168C	YLR238W	YHR115C	YDR027C	YDR200C
##	1	1	1	1	1	1	1	1
##	YPR133W-A	YPR111W	YDR146C	YBL085W	YBL023C	YEL032W	YLR045C	YKL139W
##	1	1	1	1	1	1	1	1
##	YGL038C	YHR079C	YLR116W	YIR031C	YLR195C	YGL097W	YNL299W	YHR154W
##	1	1	1	1	1	1	1	1
##	YLR306W	YBR021W	YDR164C	YNL209W	YKL196C	YIL153W	YCR067C	YJL174W
##	1	1	1	1	1	1	1	1
##	YOR297C	YKL126W	YGL226C-A	YDR177W	YMR022W	YER015W	YBR080C	YBL050W
##	1	1	1	1	1	1	1	1
##	YOR257W	YNL102W	YBR097W	YDR495C	YGL095C	YPL155C	YHR202W	YPL209C
##	1	1	1	1	1	1	1	1
##	YGR238C	YNL031C	YGR116W	YBL082C	YHR134W	YIL030C	YNL006W	YKL176C
##	1	1	1	1	1	1	1	1
##	YMR284W	YGL027C	YGR098C	YBL069W	YHR010W	YPR116W	YDR369C	YDR217C
##	1	1	1	1	1	1	1	1
##	YBR215W	YOL068C	YOR025W	YMR224C	YNL171C	YOR160W	YAL026C	YLR425W
##	1	1	1	1	1	1	1	1
##	YNL289W	YMR299C	YOR153W	YKR047W	YIL159W	YDL117W	YLR381W	YJR053W
##	1	1	1	1	1	1	1	1
##	YDR289C	YBR095C	YBR107C	YNL170W	YHR191C	YBR231C	YNL215W	YNL307C
##	1	1	1	1	1	1	1	1
##	YML016C	YCL016C	YJR143C	YOR321W	YKL092C	YLR372W	YOR027W	YER068W
##	1	1	1	1	1	1	1	1
##	YER122C	YKL020C	YDR351W	YLR433C	YKL190W	YLL050C	YLR235C	YNL098C
##	1	1	1	1	1	1	1	1
##	YMR060C							

```
## 1
```

```
clo<-closeness(yeast)
```

```
## Warning in closeness(yeast): At centrality.c:2874 :closeness centrality is not
## well-defined for disconnected graphs
```

```
#cercanía de la centralidad, también es una medida de centralidad. Suma todas las distancias, y este va
#sort(yeast, decreasing=TRUE) #no lo corrí porque mi computadora colapsa horrible, pero...
# ordenamos de modo decreciente, por lo que así sabremos cuales son los nodos con mayor closeness centr
```

2. Clusterizar la red por al menos dos métodos y determinar el tamaño del clúster más grande.

```
#Finding community structure by multi-level optimization of modularity (louvain)
```

```
metd1 <- cluster_louvain(yeast)
c1<-table(membership(metd1)) #En total hay 114 clusters,
#y el tamaño del cluster más grande es de 460 nodos
sort(c1, decreasing = TRUE)
```

```
##
## 4 11 12 8 1 7 20 10 5 2 15 18 17 31 3 16 9 6 30 14
## 460 325 187 180 173 157 116 110 98 90 83 83 59 54 52 34 29 22 20 15
## 27 22 32 35 96 23 29 19 21 26 59 68 94 24 39 53 98 107 13 25
## 15 7 7 7 7 6 6 5 5 5 5 5 5 4 4 4 4 4 3 3
## 36 62 65 69 70 75 76 93 95 97 104 28 33 34 37 38 40 41 42 43
## 3 3 3 3 3 3 3 3 3 3 3 2 2 2 2 2 2 2 2 2
## 44 45 46 47 48 49 50 51 52 54 55 56 57 58 60 61 63 64 66 67
## 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## 71 72 73 74 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92
## 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## 99 100 101 102 103 105 106 108 109 110 111 112 113 114
## 2 2 2 2 2 2 2 2 2 2 2 2 2 2
```

```
##
#Community strucure via short random walks (walktrap)
mtd2<- cluster_walktrap(yeast)
c2<-table(membership(mtd2))
sort(c2, decreasing=TRUE)
```

```
##
## 6 106 13 1 17 12 18 75 37 8 43 11 20 53 110 101 3 9 118 15
## 438 184 123 83 58 46 41 32 30 28 28 26 24 24 24 22 21 21 20 19
## 100 29 28 42 102 87 4 52 58 67 193 7 10 163 31 74 104 219 275 41
## 19 17 16 16 16 15 14 14 14 14 14 13 12 12 11 11 11 11 10
## 66 78 97 105 112 280 59 61 62 114 21 22 71 203 223 267 60 68 70 85
## 10 10 10 10 10 10 9 9 9 9 8 8 8 8 8 8 7 7 7 7
## 108 124 132 145 174 199 220 224 5 14 30 36 40 44 46 49 57 77 83 86
```

```
## 7 7 7 7 7 7 7 7 6 6 6 6 6 6 6 6 6 6 6
## 103 147 269 277 19 47 50 65 69 96 99 107 175 225 226 228 231 235 242 272
## 6 6 6 6 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
## 278 279 2 25 27 39 45 48 51 54 55 73 81 82 88 90 92 95 111 125
## 5 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
## 138 141 215 217 227 233 234 243 244 245 246 247 249 250 251 253 268 273 274 16
## 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 3
## 23 24 26 32 33 34 35 38 56 63 64 76 79 80 84 89 93 94 98 109
## 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
## 113 116 152 172 192 196 198 200 201 204 209 211 212 213 214 218 221 222 229 230
## 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
## 232 236 237 238 239 240 241 248 254 255 256 257 258 259 260 261 262 263 264 266
## 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
## 270 271 276 281 282 307 311 322 72 91 115 117 119 120 121 122 123 126 127 128
## 3 3 3 3 3 3 3 3 2 2 2 2 2 2 2 2 2 2 2
## 129 130 131 133 134 135 136 137 139 140 142 143 144 146 148 149 150 151 153 154
## 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## 155 156 157 158 159 160 161 162 164 165 166 167 168 169 170 171 173 176 177 178
## 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## 179 180 181 182 183 184 185 186 187 188 189 190 191 194 195 197 202 205 206 207
## 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## 208 210 216 252 265 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297
## 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## 298 299 300 301 302 303 304 305 306 308 309 310 312 313 314 315 316 317 318 319
## 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## 320 321 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340
## 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
## 341 342 343 344 345 346 347 348 349 350 351 352 353
## 2 2 2 2 2 2 2 2 1 1 1 1 1
```

#el cluster más grande comprende 438 nodos, y en total son 353 clusters.

j. Determine si la red es de mundo pequeño, ultra pequeño u otra. Para saber si la red es de mundo pequeño, debemos saber la media de la distancia, entre más pequeña, es más certero que la red es de mundo pequeño, además, también debe calcularse el coeficiente de clusterización o transitivity, en el que se espera obtener valores grandes, si se trata de una red de mundo pequeño.

Primero la distancia media, que arroja un valor cercano a 5.1, no es pequeño.

```
#primero la distancia media
mean_distance(yeast)
```

```
## [1] 5.095629
```

Este comando sirve para calcular la transitivity, cuyo valor es de 0.4668, un valor pequeño.

```
transitivity(yeast)
```

```
## [1] 0.4686178
```

#

No se trata de una red de mundo pequeño. Me parece que es una red free-scale, debido a que algunos nodos están altamente conectados, mientras que otros tienen un degree pequeño.