

## PRÁCTICA 2

### SUMAR COMPONENTES DEL VECTOR

**Se suman los valores del vector con un bucle for.**

```
v=c(1/3, sqrt(7),9/6,0.5)
pepito=0
for(i in 1:length(v)){
    pepito=pepito+v[i]
}
```

pepito

**Para sumar los valores del vector con un bucle while.**

```
i=1
rosita=0
while(i<=length(v)){
    rosita=rosita+v[i]
}
```

rosita

**Pero el bucle anterior no acabaría nunca porque siempre se cumpliría la condición de  $i=1$ ; por lo tanto, para que pare se añade  $i=i+1$  que va incrementando el índice del vector que se utiliza en cada momento.**

```
i=1
rosita=0
while(i<=length(v)){
    rosita=rosita+v[i]
    i=i+1
}
```

rosita

### #EJERCICIO 1. MEDICACIÓN

Se sabe que la evolución de las células infectadas en función del tiempo sigue la ley  $N(t) = 10\exp(t/20)$  (\*) donde N es el número de nuevas células infectadas y t es el tiempo. Con el objeto de decidir el tipo de medicación se seguirá el siguiente criterio:

- Si  $N < 5000$ , enfermo recuperable sin medicación.
- Si  $N \geq 5000$  y  $N \leq 10000$ , medicación moderada.
- Si  $N > 20000$ , medicación agresiva.
- En otro caso se trata de una situación intermedia.

Para ello, primero definimos la función N, después inicializamos los vectores xd (valores del tiempo), yd (número de células infectadas) y color igualándolos a cero.

Iniciamos el bucle while, si n es menor que 5000 entonces asignamos el color verde (que representa que el enfermo es recuperable sin medicación). Si N es menor o igual que 10000 y mayor o igual que 5000 entonces asignamos el color naranja y si es mayor que 20000 asignamos el color azul. Incrementamos los valores de la variable índice y del tiempo. Cerramos el bucle.

Representamos gráficamente la función que determina el número de células infectadas en función del tiempo.

Añadimos la legenda.

```
N=function(t){
    10*exp(t/20)
}
i=1
xd=0
yd=0
color=0
```

```

tfin=168
dt=0.5
t=0
while(t<=tfin){
  xd[i]=t; yd[i]=N(t)
  if (N(t)<=5000){
    color[i]='green'
  }else if (N(t)>5000& N(t)<10000){
    color[i]='orange'
  }else if (N(t)>20000){
    color[i]='red'
  }else{
    color[i]='blue'
  }
  i=i+1; t=t+dt
}
color
plot(xd,yd,xlab='Tiempo(horas)',ylab='num células',main='medicacion',type='b',col=color)
legend(x='top',c('sin medicacion','Medicacion moderada','Situación intermedia',
'Medicación agresiva',fill=c('green','orange','blue','red'))

```

```

> color
[1] "green" "green" "green" "green" "green" "green" "green" "green"
[9] "green" "green" "green" "green" "green" "green" "green" "green"
[17] "green" "green" "green" "green" "green" "green" "green" "green"
[25] "green" "green" "green" "green" "green" "green" "green" "green"
[33] "green" "green" "green" "green" "green" "green" "green" "green"
[41] "green" "green" "green" "green" "green" "green" "green" "green"
[49] "green" "green" "green" "green" "green" "green" "green" "green"
[57] "green" "green" "green" "green" "green" "green" "green" "green"
[65] "green" "green" "green" "green" "green" "green" "green" "green"
[73] "green" "green" "green" "green" "green" "green" "green" "green"
[81] "green" "green" "green" "green" "green" "green" "green" "green"
[89] "green" "green" "green" "green" "green" "green" "green" "green"
[97] "green" "green" "green" "green" "green" "green" "green" "green"
[105] "green" "green" "green" "green" "green" "green" "green" "green"
[113] "green" "green" "green" "green" "green" "green" "green" "green"
[121] "green" "green" "green" "green" "green" "green" "green" "green"
[129] "green" "green" "green" "green" "green" "green" "green" "green"
[137] "green" "green" "green" "green" "green" "green" "green" "green"
[145] "green" "green" "green" "green" "green" "green" "green" "green"
[153] "green" "green" "green" "green" "green" "green" "green" "green"
[161] "green" "green" "green" "green" "green" "green" "green" "green"
[169] "green" "green" "green" "green" "green" "green" "green" "green"
[177] "green" "green" "green" "green" "green" "green" "green" "green"
[185] "green" "green" "green" "green" "green" "green" "green" "green"
[193] "green" "green" "green" "green" "green" "green" "green" "green"
[201] "green" "green" "green" "green" "green" "green" "green" "green"
[209] "green" "green" "green" "green" "green" "green" "green" "green"
[217] "green" "green" "green" "green" "green" "green" "green" "green"
[225] "green" "green" "green" "green" "green" "green" "green" "green"
[233] "green" "green" "green" "green" "green" "green" "green" "green"
[241] "green" "green" "green" "green" "green" "green" "green" "green"
[249] "green" "orange" "orange" "orange" "orange" "orange" "orange" "orange"
[257] "orange" "orange" "orange" "orange" "orange" "orange" "orange" "orange"
[265] "orange" "orange" "orange" "orange" "orange" "orange" "orange" "orange"
[273] "orange" "orange" "orange" "orange" "orange" "blue" "blue" "blue"
[281] "blue" "blue" "blue" "blue" "blue" "blue" "blue" "blue"
[289] "blue" "blue" "blue" "blue" "blue" "blue" "blue" "blue"
[297] "blue" "blue" "blue" "blue" "blue" "blue" "blue" "blue"
[305] "blue" "red" "red" "red" "red" "red" "red" "red"
[313] "red" "red" "red" "red" "red" "red" "red" "red"
[321] "red" "red" "red" "red" "red" "red" "red" "red"
[329] "red" "red" "red" "red" "red" "red" "red" "red"
[337] "red"

```

