

In [34]:

```
day_off <- c(2, 2, 0, 0, 5, 8, 3, 4, 1, 0,  
            0, 7, 1, 7, 1, 5, 4, 0, 4, 0,  
            1, 8, 9, 7, 0, 1, 7, 2, 5, 5,  
            4, 3, 3, 0, 0, 2, 5, 1, 3, 0,  
            1, 0, 2, 4, 5, 0, 5, 7, 5, 1)
```

In [35]:

```
freq <- table(day_off)
```

In [36]:

```
sum(freq)
```

Out[36]:

50

In [37]:

```
freq
```

Out[37]:

```
day_off  
 0  1  2  3  4  5  7  8  9  
12  8  5  4  5  8  5  2  1
```

In [38]:

```
freq[1]
```

Out[38]:

0: 12

In [39]:

```
library(xtable)  
xtable(freq)
```

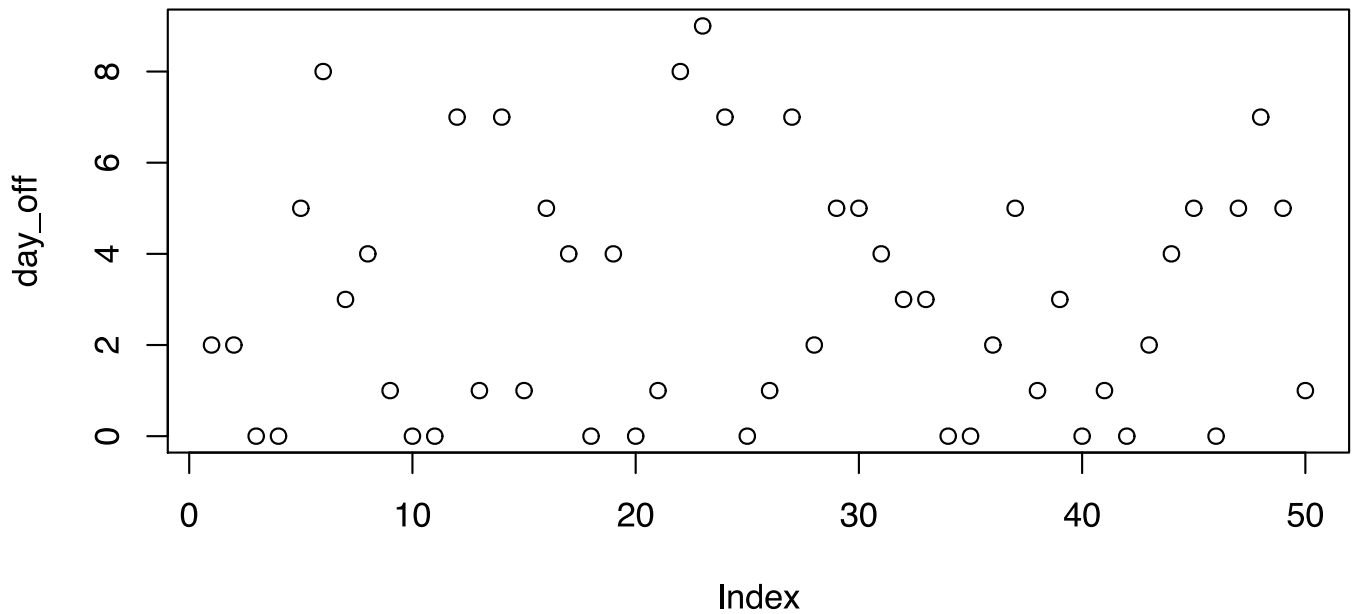
Out[39]:

	day_off
0	12
1	8
2	5
3	4
4	5
5	8
7	5
8	2
9	1

1. Quanti lavoratori hanno preso almeno 1 giorno di malattia?
2. Quanti lavoratori hanno preso da 3 a 5 giorni di malattia?
3. Quanti lavoratori hanno preso più di 5 giorni di malattia?

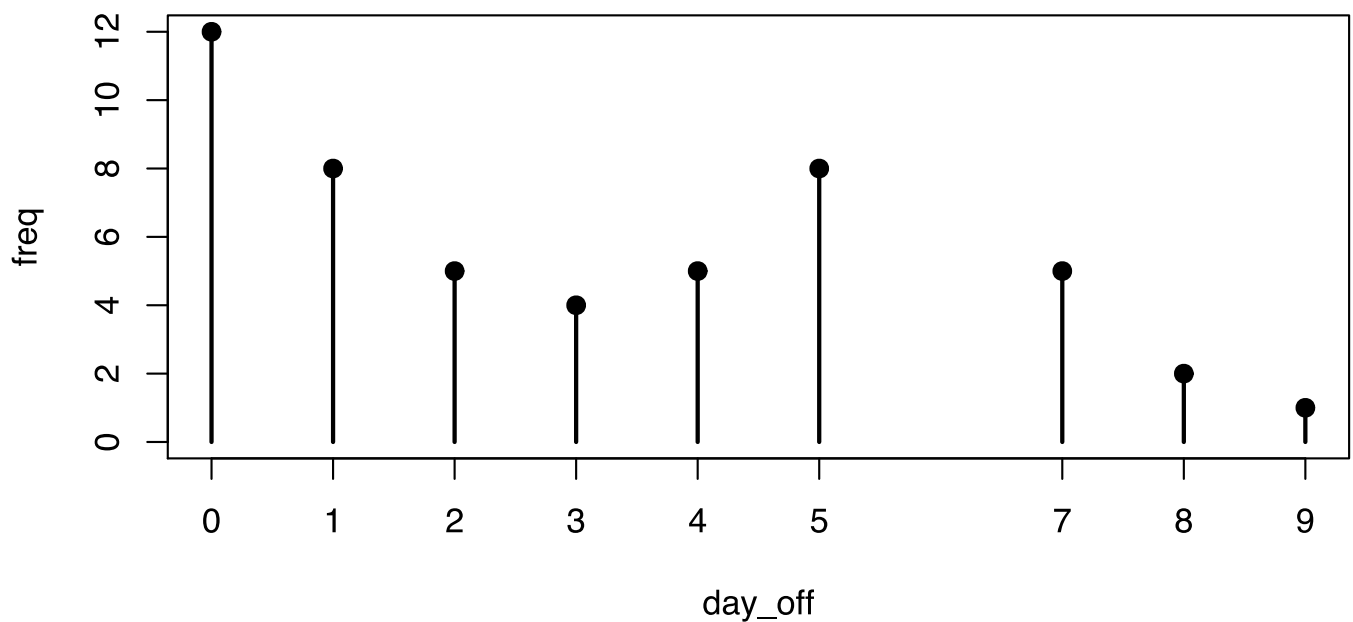
In [86]:

```
options(repr.plot.height=4)  
plot(day_off)
```



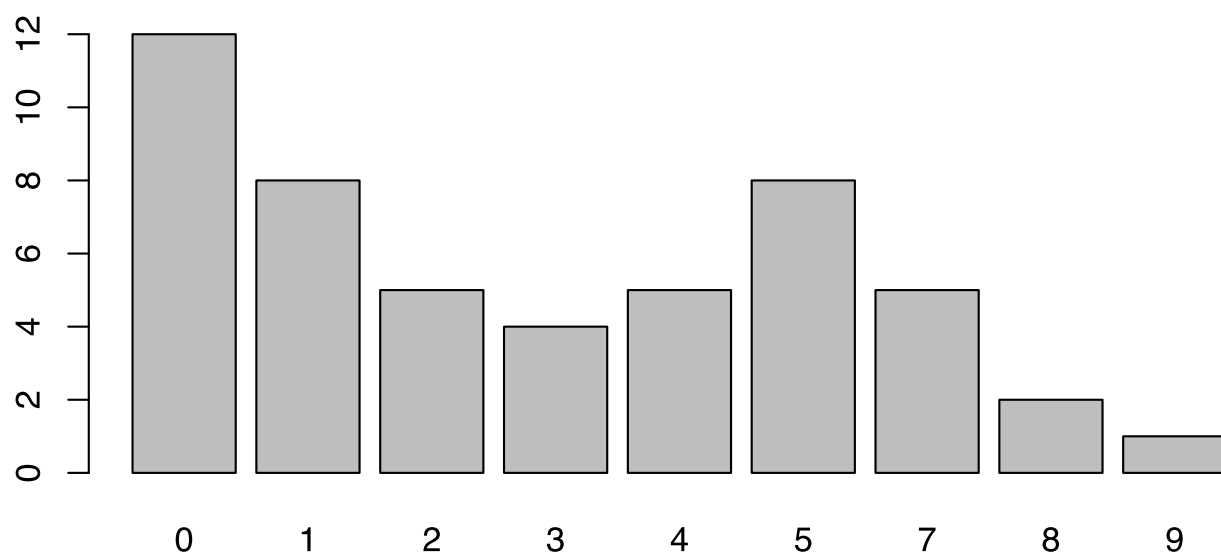
In [98]:

```
plot(freq, type="p", bg="black", pch=21)  
lines(freq)
```



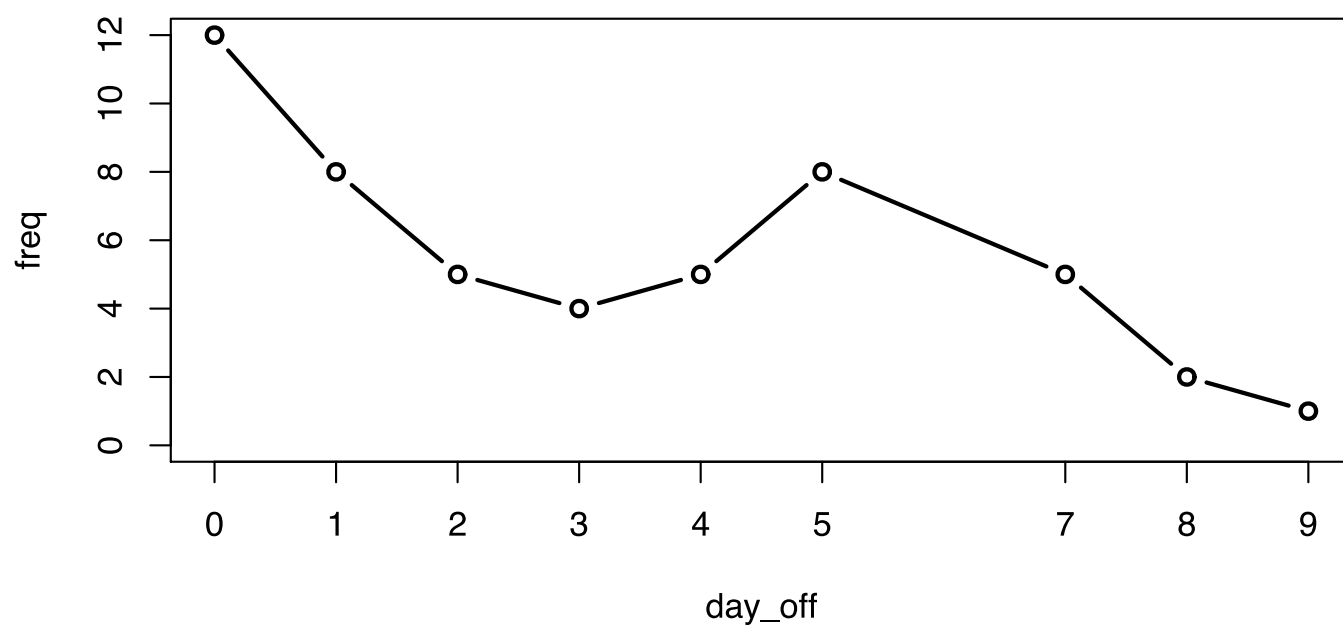
In [42]:

```
barplot(freq)
```



In [43]:

```
plot(freq, type="b")
```



In [45]:

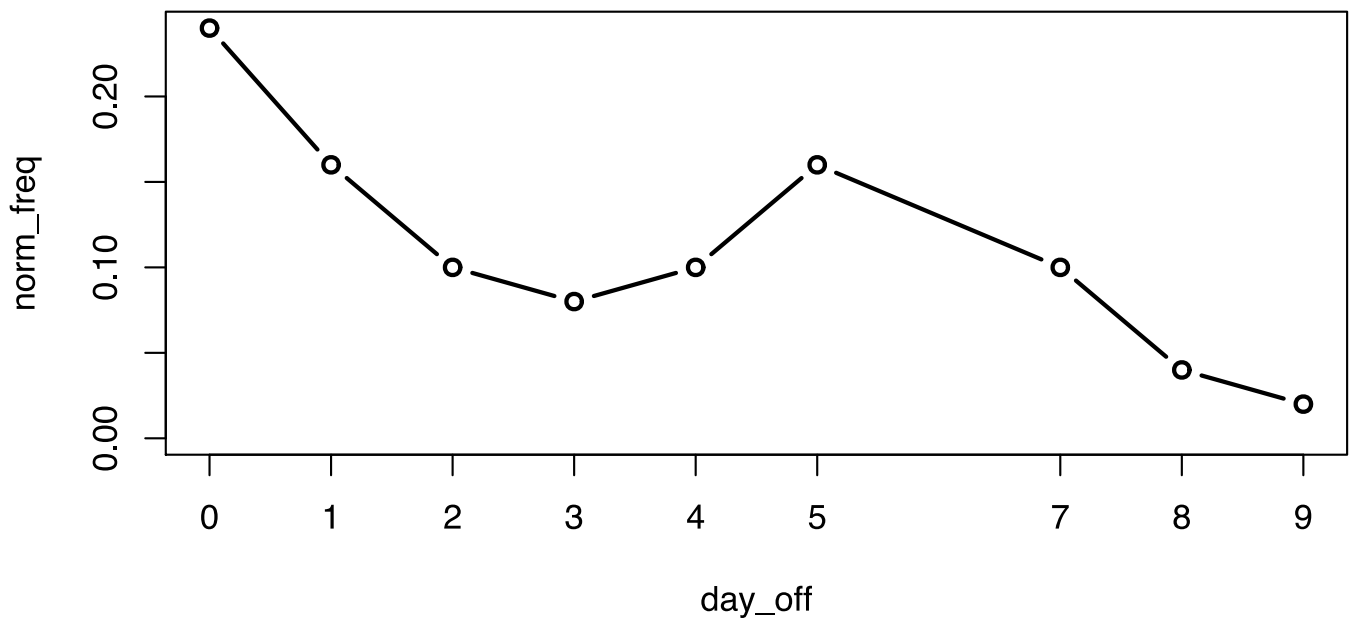
```
norm_freq = freq / sum(freq)
norm_freq
```

Out[45]:

```
day_off
  0    1    2    3    4    5    7    8    9
0.24 0.16 0.10 0.08 0.10 0.16 0.10 0.04 0.02
```

In [46]:

```
plot(norm_freq, type="b")
```



In [47]:

```
years <- 1968:2004
names <- c("Bob Goalby", "George Archer", "Billy Casper", "Charles Coody",
           "Jack Nicklaus", "Tommy Aaron", "Gary Player", "Jack Nicklaus",
           "Ray Floyd", "Tom Watson", "Gary Player", "Fuzzy Zoeller",
           "Severiano Ballesteros", "Tom Watson", "Craig Stadler",
           "Severiano Ballesteros", "Ben Crenshaw", "Bernhard Langer",
           "Jack Nicklaus", "Larry Mize", "Sandy Lyle", "Nick Faldo",
           "Nick Faldo", "Ian Woosnam", "Fred Couples", "Bernhard Langer",
           "J.M. Olazabal", "Ben Crenshaw", "Nick Faldo", "Tiger Woods",
           "Mark O'Meara", "J.M. Olazabal", "Vijay Singh", "Tiger Woods",
           "Tiger Woods", "Mike Weir", "Phil Nickelson")
points <- c(277, 281, 279, 279, 286, 283, 278, 276, 271, 276, 277, 280, 275,
            280, 284, 280, 277, 282, 279, 285, 281, 283, 278, 277, 275, 277,
            279, 274, 276, 270, 279, 280, 278, 272, 276, 281, 279)
```

In [48]:

```
masters <- data.frame(years, names, points)
masters
```

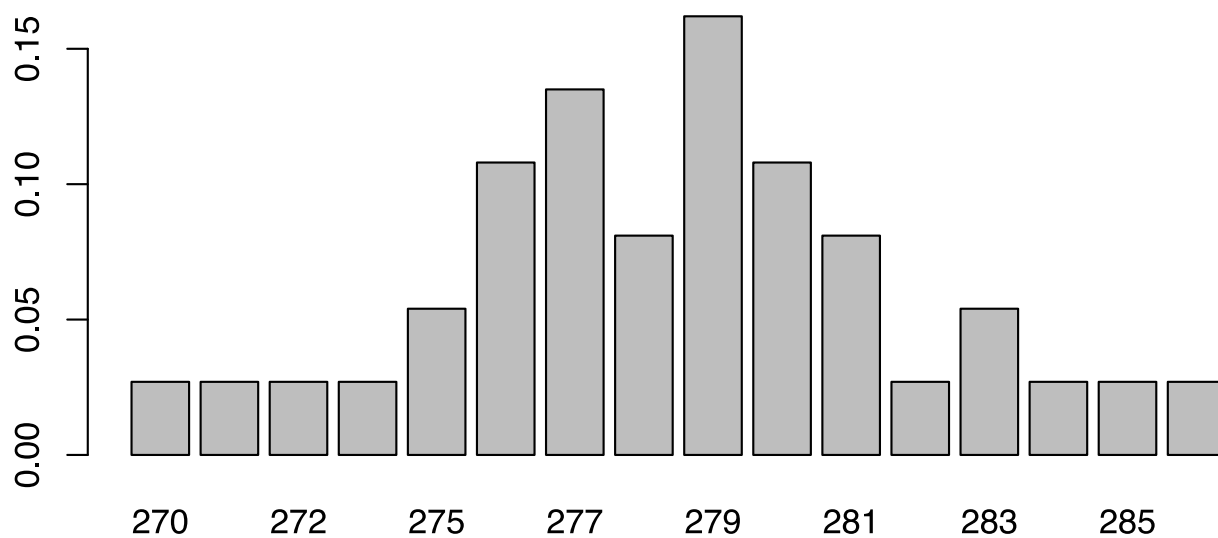
Out[48]:

	years	names	points
1	1968	Bob Goalby	277
2	1969	George Archer	281
3	1970	Billy Casper	279
4	1971	Charles Coody	279
5	1972	Jack Nicklaus	286
6	1973	Tommy Aaron	283
7	1974	Gary Player	278
8	1975	Jack Nicklaus	276
9	1976	Ray Floyd	271
10	1977	Tom Watson	276
11	1978	Gary Player	277
12	1979	Fuzzy Zoeller	280
13	1980	Severiano Ballesteros	275
14	1981	Tom Watson	280
15	1982	Craig Stadler	284
16	1983	Severiano Ballesteros	280
17	1984	Ben Crenshaw	277
18	1985	Bernhard Langer	282
19	1986	Jack Nicklaus	279
20	1987	Larry Mize	285
21	1988	Sandy Lyle	281
22	1989	Nick Faldo	283
23	1990	Nick Faldo	278
24	1991	Ian Woosnam	277
25	1992	Fred Couples	275
26	1993	Bernhard Langer	277
27	1994	J.M. Olazabal	279
28	1995	Ben Crenshaw	274

29	1996	Nick Faldo	276
30	1997	Tiger Woods	270
31	1998	Mark O'Meara	279
32	1999	J.M. Olazabal	280
33	2000	Vijay Singh	278
34	2001	Tiger Woods	272
35	2002	Tiger Woods	276
36	2003	Mike Weir	281
37	2004	Phil Nickelson	279

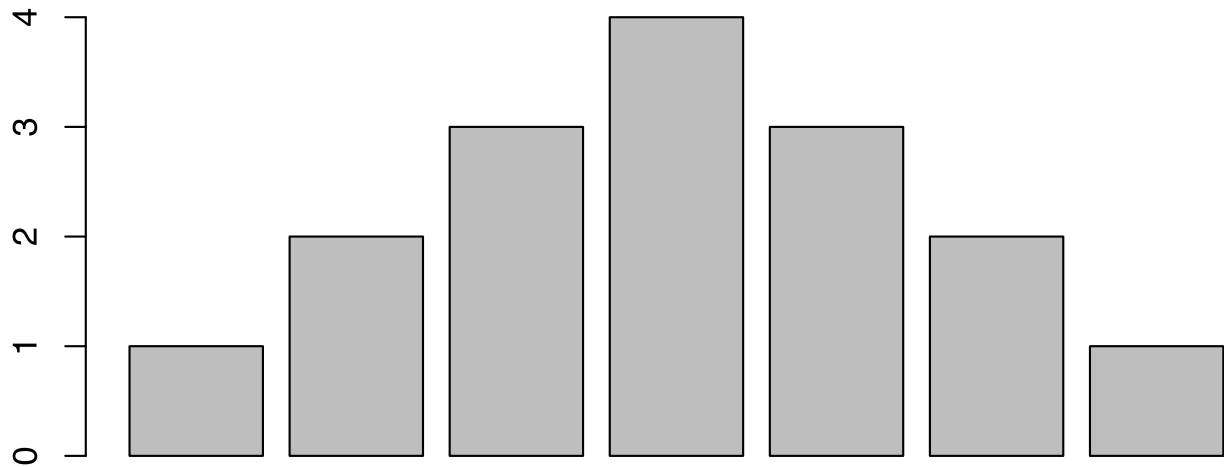
In [49]:

```
points_norm_freq <- round(table(masters$points) / nrow(masters), digits=3)  
barplot(points_norm_freq)
```



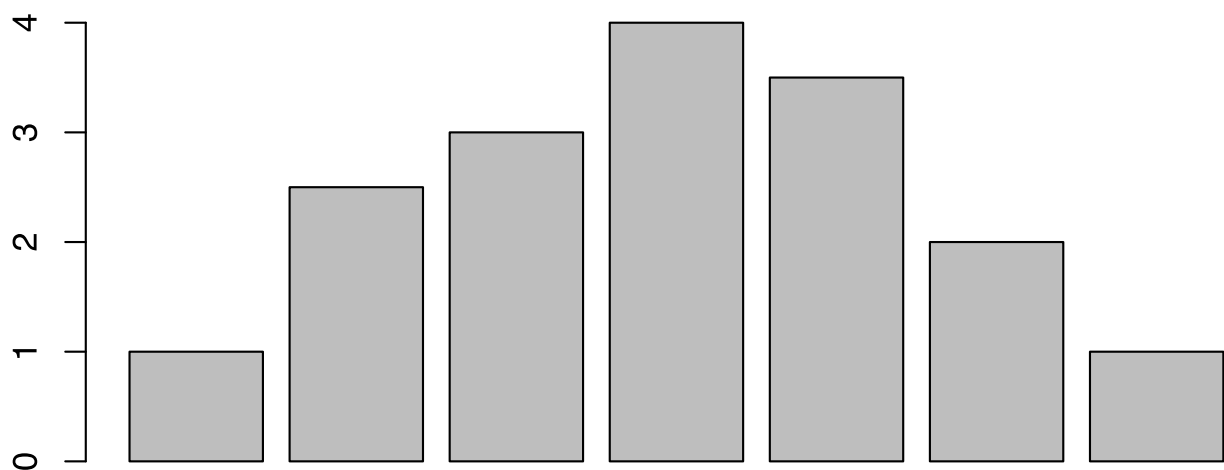
In [50]:

```
barplot(c(1, 2, 3, 4, 3, 2, 1))
```



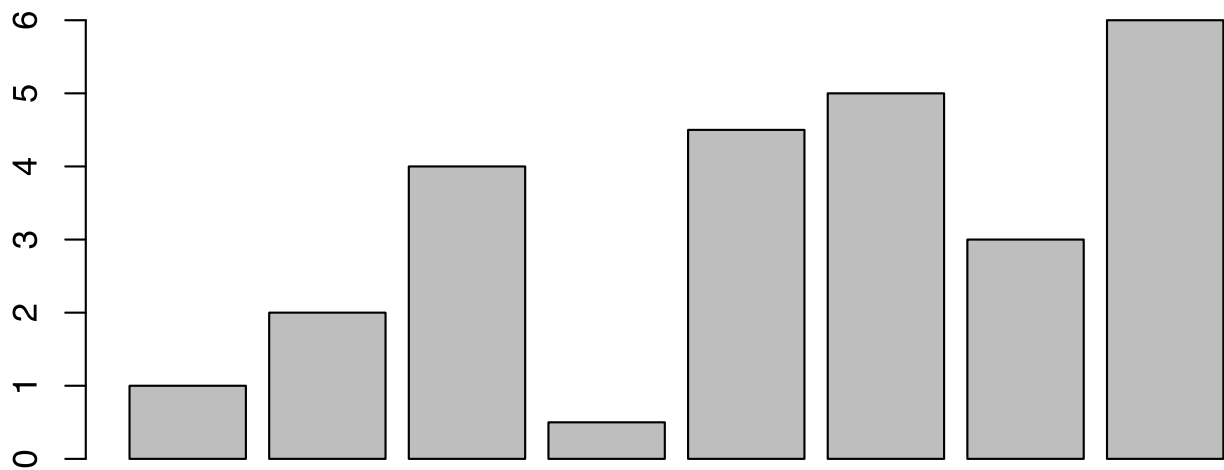
In [51]:

```
barplot(c(1, 2.5, 3, 4, 3.5, 2, 1))
```



In [52]:

```
barplot(c(1, 2, 4, 0.5, 4.5, 5, 3, 6))
```

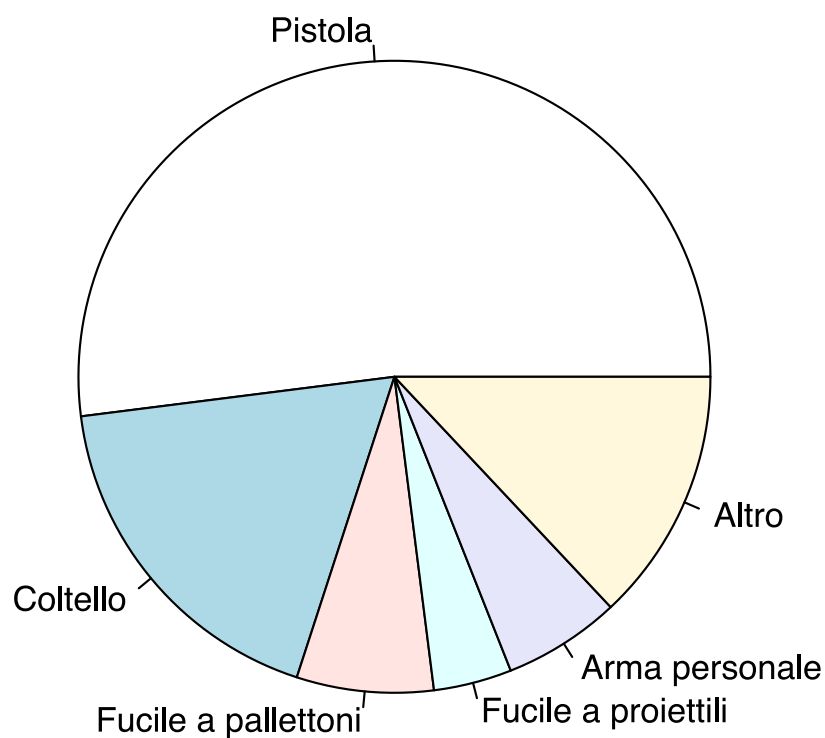


In [54]:

```
weapons <- c("Pistola", "Coltello", "Fucile a pallettoni",  
            "Fucile a proiettili", "Arma personale", "Altro")  
percentage <- c(52, 18, 7, 4, 6, 13)  
data.frame(weapons, percentage)  
options(repr.plot.height = 6)  
pie(percentage, labels=weapons)
```

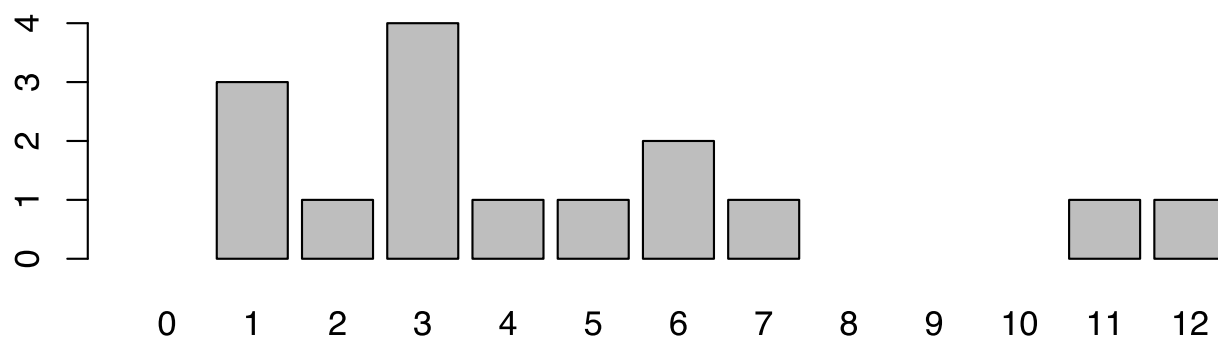
Out[54]:

	weapons	percentage
1	Pistola	52
2	Coltello	18
3	Fucile a pallettoni	7
4	Fucile a proiettili	4
5	Arma personale	6
6	Altro	13



In [55]:

```
options(repr.plot.height=3)
barplot(c(0, 3, 1, 4, 1, 1, 2, 1, 0, 0, 0, 1, 1), names.arg = sapply(0:12, as.
```



1. Qual è il numero massimo di isolati di distanza tra le case degli studenti e la scuola?
2. Qual è il numero minimo?
3. Quanti studenti vivono a meno di 5 isolati dalla scuola?
4. Quanti studenti vivono a più di 4 isolati dalla scuola?

In [56]:

```
cholesterol <- c(213, 174, 192, 200, 187, 181, 216, 206, 221, 212,
  193, 196, 220, 200, 199, 178, 193, 205, 196, 195,
  191, 171, 221, 204, 204, 183, 194, 200, 183, 188,
  193, 211, 202, 213, 194, 184, 191, 191, 183, 227)
```

In [58]:

```
sort(cholesterol)
```

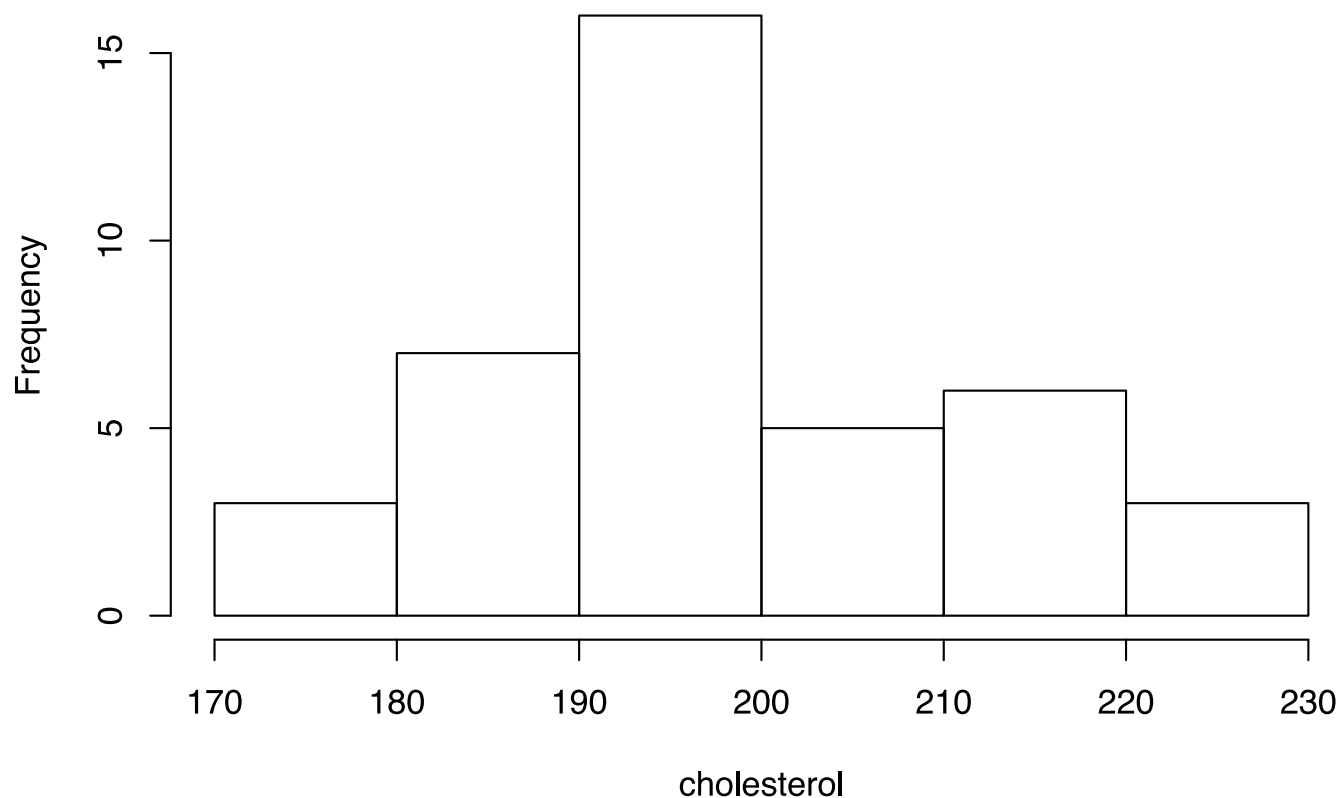
Out[58]:

```
171 174 178 181 183 183 183 184 187 188 191 191 191
192 193 193 193 194 194 195 196 196 199 200 200 200
202 204 204 205 206 211 212 213 213 216 220 221 221
227
```

In [61]:

```
options(repr.plot.height=5)  
hist(cholesterol)
```

Histogram of cholesterol



In [62]:

```
pressure_30_40 <- c(3, 17, 118, 460, 768, 675, 312, 120, 45, 18, 3, 1)  
pressure_50_60 <- c(1, 2, 23, 57, 122, 149, 167, 73, 62, 35, 20, 9, 3, 5, 2, 1)
```

In [99]:

```
sum(pressure_30_40)  
sum(pressure_50_60)
```

Out[99]:

2540

Out[99]:

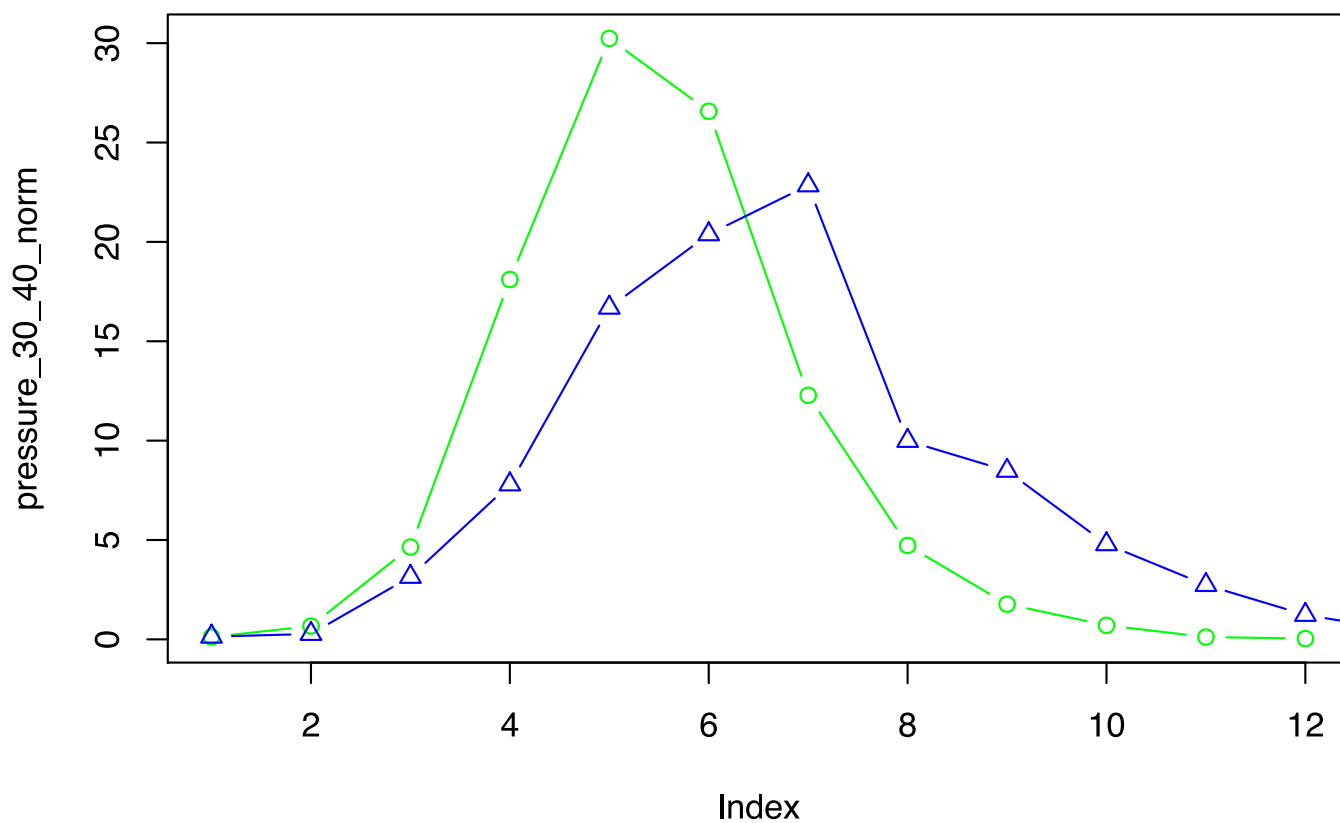
731

In [68]:

```
pressure_30_40_norm <- pressure_30_40 / sum(pressure_30_40) * 100  
pressure_50_60_norm <- pressure_50_60 / sum(pressure_50_60) * 100
```

In [83]:

```
plot(pressure_30_40_norm, type="b", col="green")  
lines(pressure_50_60_norm, type="b", pch=2, col="blue")
```



In [144]:

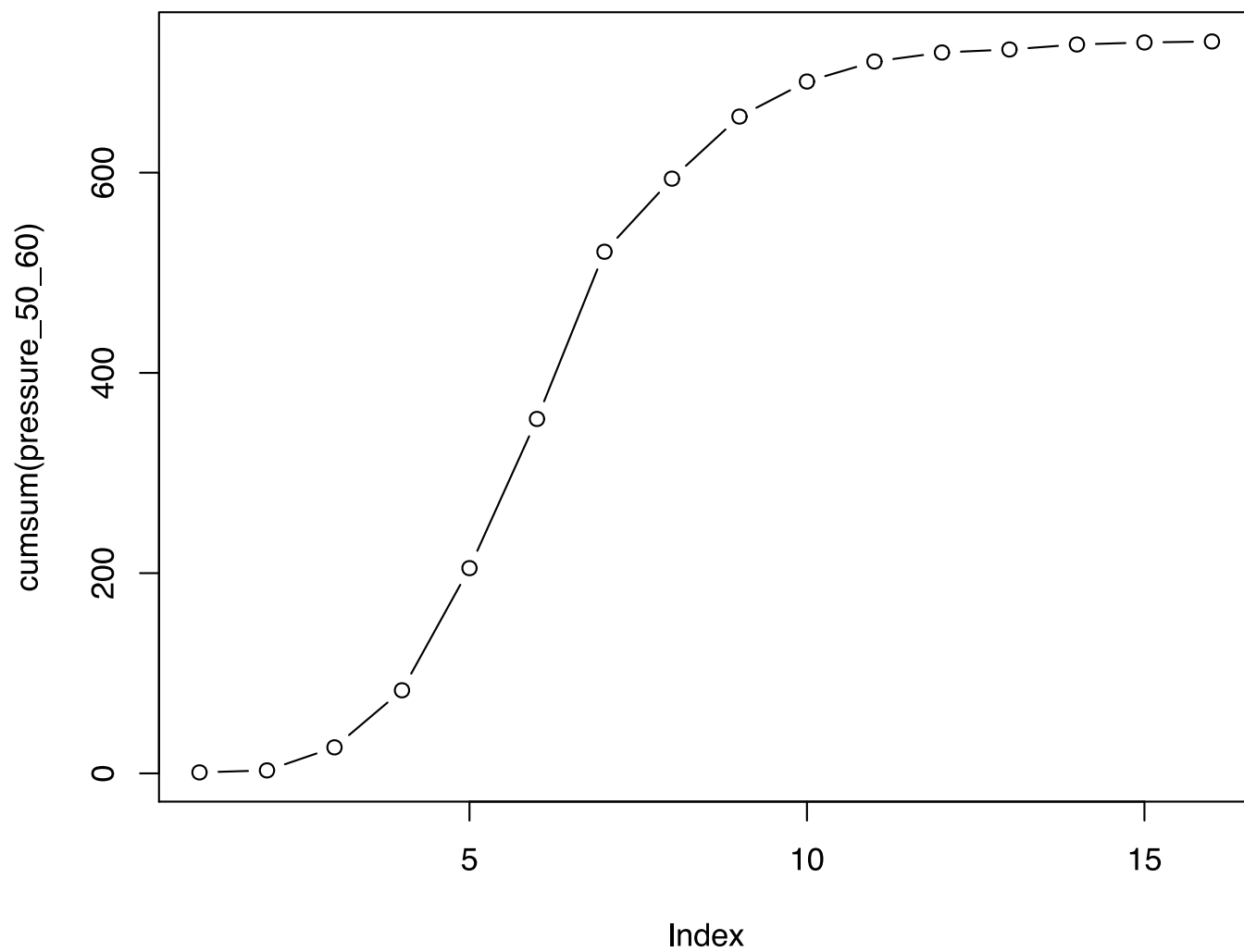
```
cumsum(pressure_50_60)
```

Out[144]:

```
1  3 26 83 205 354 521 594 656 691 711 720 723 728  
730 731
```

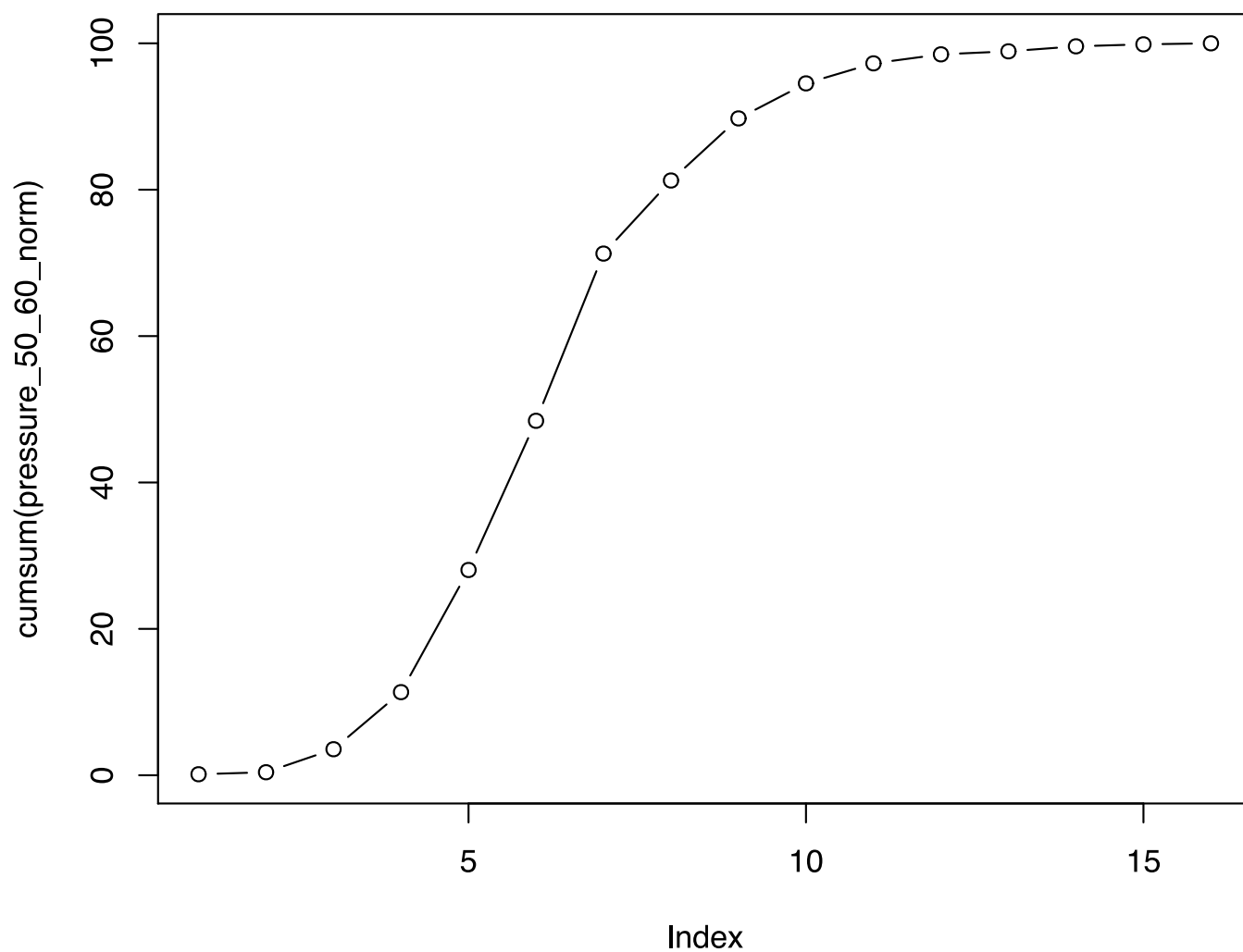
In [147]:

```
plot(cumsum(pressure_50_60), type="b")
```



In [148]:

```
plot(cumsum(pressure_50_60_norm), type="b")
```



In [100]:

```
income <- c(30941, 25128, 32151, 26183, 23512, 32996, 33276,  
            42706, 32779, 42120, 29596, 28821, 30001, 25057,  
            33404, 28240, 28280, 29141, 25579, 25446, 27744,  
            36298, 39244, 30296, 34071, 22372, 28936, 25020,  
            29771, 30180, 34334, 39453, 23941, 36043, 27711,  
            26982, 29405, 25575, 28731, 31727, 31319, 25400,  
            26894, 27671, 28551, 24306, 29567, 32922, 32677,  
            23688, 29923, 30578)
```

In [119]:

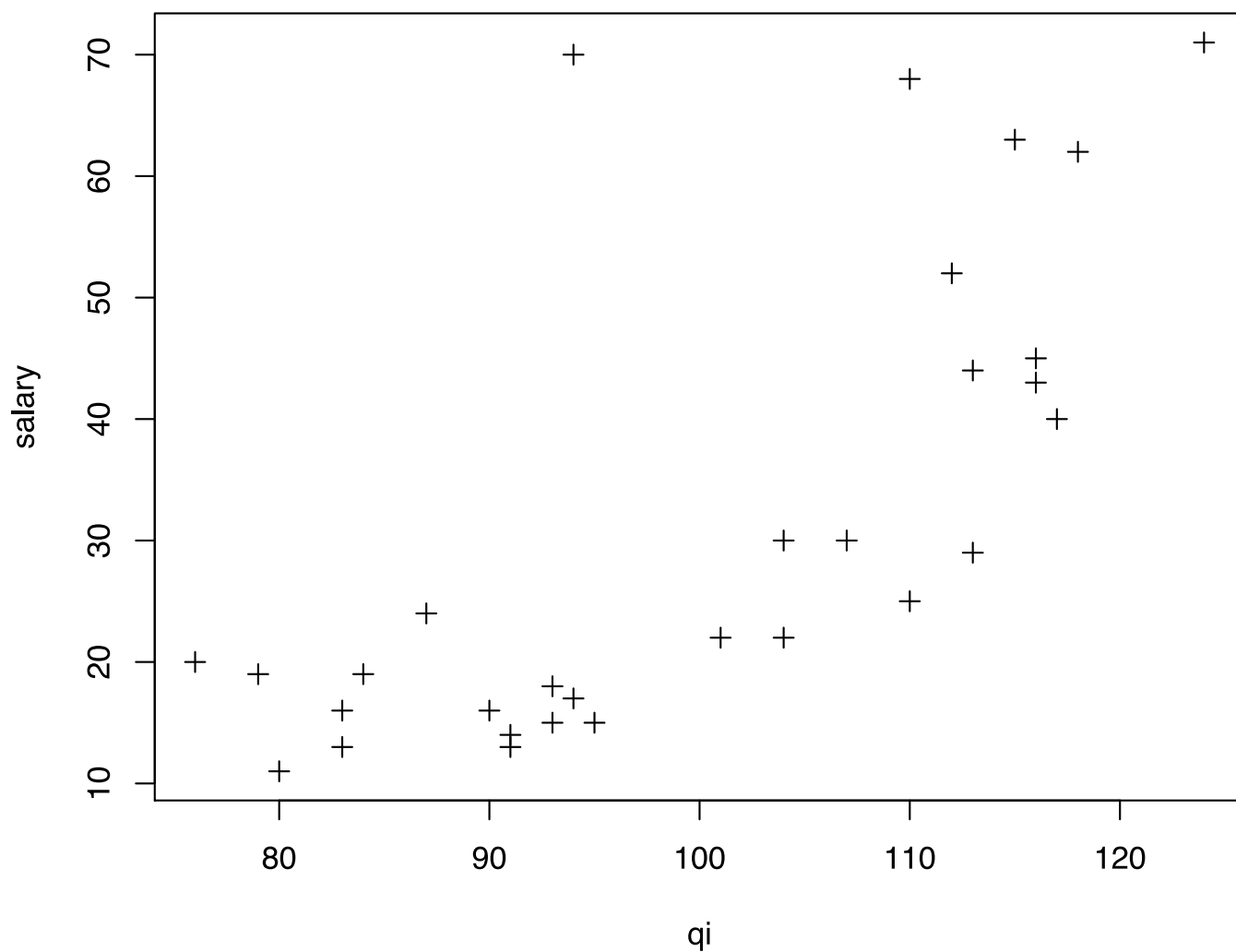
```
stem(income, scale=3)
```

The decimal point is 3 digit(s) to the right of the |

22		4
23		579
24		3
25		0114466
26		29
27		0777
28		236789
29		146689
30		02369
31		37
32		2789
33		034
34		13
35		
36		03
37		
38		
39		25
40		
41		
42		17

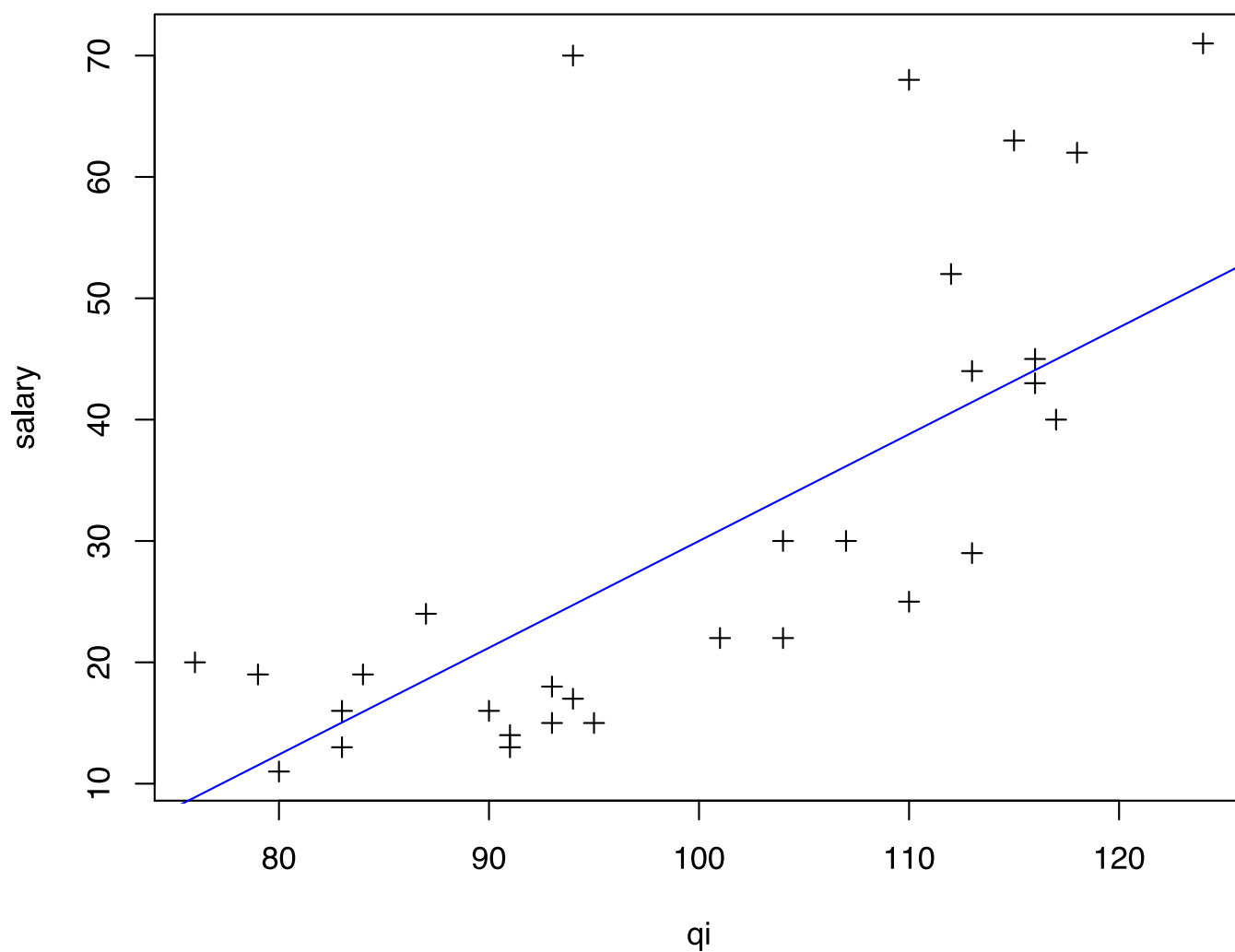
In [123]:

```
qi <- c(110, 107, 83, 87, 117, 104, 110, 118, 116, 94,  
        93, 101, 93, 76, 91, 84, 83, 112, 80, 91,  
        113, 124, 79, 116, 113, 94, 95, 104, 115, 90)  
salary <- c(68, 30, 13, 24, 40, 22, 25, 62, 45, 70,  
            15, 22, 18, 20, 14, 19, 16, 52, 11, 13,  
            29, 71, 19, 43, 44, 17, 15, 30, 63, 16)  
options(repr.plot.height=6)  
plot(qi, salary, pch=3)
```



In [143]:

```
plot(qi, salary, pch=3)
abline(a=-58, b=0.88, col="blue")
```



In [151]:

```
1161.7/37
```

Out[151]:

```
31.3972972972973
```

In []:

