Examen 2: Mariana Ávalos y Heráclito

Ejercicio 1

- Cree un conjunto de datos manzanas que representen 500 manzanas elegidas al azar, siguiendo la distribución mencionada.

```
#Problema 1
n_manz = 500
stdv_manz = 30
media_manz = 200

#1
sample1 = rnorm(n_manz, media_manz, stdv_manz)
sample1
```

```
> sample1
  [1] 172.49335 214.61371 149.65824 166.91295 261.24045 205.02288 238.51874 262.67648 214.71061 220.91471 185.06776 182.05904 186.84429 169.38958
 [15] 195.78539 221.97314 259.02430 267.20105 202.26036 153.06464 251.46298 206.72596 204.29223 165.75680 212.92439 159.25186 180.33673 145.42569
 [29] 157.59124 208.08667 209.87194 260.36120 213.19898 235.56036 228.10511 184.12070 210.28819 179.02866 247.18805 211.69278 183.88702 235.08700
 [43] 153.82178 226.81258 221.79307 201.04574 215.44372 183.50711 203.03860 215.77542 171.84055 184.86912 256.49057 190.48245 241.28586 210.87648
 [57] 175.16363 209.56998 205.46081 188.74924 195.33798 150.57479 291.13378 123.72246 214.39911 245.21654 180.83478 127.18838 205.16255 138.92023
 [71] 249.24519 191.40999 121.91413 153.90806 192.45784 248.25258 226.12675 224.28548 227.83632 209.70031 201.79481 219.66946 198.90706 173.16555
 [85] 153.00185 220.47285 205.48026 178.82730 220.96149 228.04825 232.28382 186.29740 217.72618 193.08606 256.87536 250.03779 215.06612 253.55798
 [99] 230.69737 225.75178 273.02065 190.55319 206.01925 180.04343 157.46485 176.20541 190.10327 196.39926 183.27374 188.93335 165.80169 251.46012
[113] 168.27119 201.46338 211.40397 193.63118 181.18607 171.56170 170.66409 200.11089 230.08303 223.65663 161.26537 273.95467 203.08668 225.84868
[127] 152.80923 238.78778 255.02222 201.08785 145.38026 212.26813 188.94328 232.63296 259.37857 197.28651 188.77700 179.70145 266.60526 202.18431
[141] 167.73058 227.77913 176.36444 196.12958 220.16609 211.28629 185.56729 130.24893 272.98899 202.30431 185.90747 190.05115 231.23891 254.99111
[155] 225.70068 244.66259 233.62538 185.89604 192.14507 220.37029 258.70204 235.98962 202.72033 236.86132 244.02880 237.47563 220.39652 241.24743
[169] 200.78416 189.05337 206.13026 197.76223 207.11143 234.62078 182.85656 237.46012 185.77807 165.77292 221.72449 266.68363 192.74330 201.22587
[183] 207.61239 200.93334 226.22055 196.12554 187.20490 167.13607 213.05257 177.52228 204.49664 206.59653 214.69650 204.50408 161.52875 140.81254
[197] 185.51833 227.07112 166.21950 202.18300 157.13985 229.85353 240.09778 242.55255 151.21397 213.30482 168.45189 152.68273 225.70975 251.40593
[211] 207.16345 183.55850 200.73654 222.46259 191.16746 234.46842 223.60279 231.46604 192.46138 194.39937 210.66117 214.38116 208.34961 213.32696
[225] 213.54271 262.42867 159.10238 261.27854 184.62815 252.01424 176.82063 193.61298 228.38696 189.11196 170.00646 232.10864 214.77971 191.53253
[239]  90.44658 186.09890 230.09804 213.24121 216.95056 202.19850 151.31382 226.87870 191.60072 227.09767 203.03286 219.53498 180.77589 177.34166
[253] 200.41560 193.84834 139.28694 170.25433 211.93792 156.20710 174.19421 235.16831 227.16890 203.31799 174.93231 241.32681 197.39891 233.31850
[267] 208.08981 183.58586 194.33093 148.50619 185.12675 201.02941 224.98230 221.93549 267.30623 179.72136 216.53381 173.70693 186.29632 212.15622
[281] 217.55374 219.59767 258.27557 230.52820 211.18973 196.22202 171.73468 220.75265 182.95234 150.16676 195.68041 217.36366 207.16859 192.48983
[295] 186.01117 202.44289 211.73570 169.99981 210.92062 187.16002 171.91282 213.12276 224.32937 179.88936 259.56157 195.17847 182.35099 260.38887
[309] 171.25432 244.48467 190.31849 220.74506 196.88637 163.17792 229.92942 182.74118 237.40344 178.56997 200.94523 207.33093 188.01913 168.25222
[323] 178.51222 224.73420 159.65458 194.73493 198.83817 216.24172 216.82861 240.52420 179.07248 197.78754 238.24336 184.05924 163.47741 256.04954
[337] 202.39306 206.80000 180.35678 200.89425 204.42325 185.06365 229.12471 221.47690 229.54524 231.97671 151.17504 213.07468 216.98294 238.60495
[351] 189.18655 188.90066 189.46196 166.01682 215.70201 247.57906 147.27917 182.72718 197.61074 210.01953 221.04522 214.03595 212.39588 227.32836
[365] 172.78396 212.87233 249.52088 197.86373 198.99843 183.49231 182.31625 219.36649 153.66665 210.20484 191.45015 211.54409 177.82196 219.13149
[379] 170.96828 168.19340 219.42424 217.12890 244.72405 248.77354 230.21752 217.10823 237.24007 227.86046 166.07430 213.12953 199.95291 229.27434
[393] 196.14835 174.79638 246.69665 199.51619 193.96687 256.97367 195.02415 188.33016 207.74690 185.88257 219.04804 187.05989 178.92051 177.61204
[407] 190.89610 201.10587 155.86389 208.38475 239.81214 233.60151 159.09723 193.91683 181.52635 191.42193 235.89307 182.70177 287.74281 193.65796
[421] 256.16551 209.01584 227.72908 201.10151 234.86472 234.19101 174.80706 252.10930 200.31137 172.93570 169.27632 136.97225 184.11253 149.98874
[435] 205.54317 169.90887 183.03601 258.55132 150.71812 263.30553 213.60101 180.85576 216.37392 218.91103 211.95948 233.16778 265.89344 215.10617
[449] 193.52136 235.39479 225.70016 197.37494 142.36857 178.67326 145.80560 189.29106 176.93462 253.73977 222.78007 195.60900 131.13449 228.33983
[463] 187.42353 151.56827 186.30583 196.40949 202.76635 186.81665 171.93392 244.31625 219.57425 187.67463 206.82613 260.02150 193.91389 202.23591
[477] 205.11131 231.04136 184.00708 174.97745 231.14394 169.99683 232.47081 207.98456 229.31819 191.40547 165.99492 153.71933 227.23400 205.28587
[491] 222.10939 128.14027 202.79295 149.61039 229.29526 199.55650 216.10131 207.11630 176.58463 187.66730
```

- Seleccione todas las manzanas que pesen entre 170 y 230 g. Calcule el porcentaje del total que representan las manzanas seleccionadas.

```
#2
subsample1 = sample1[sample1<230]
subsample1 = subsample1[subsample1>170]
subsample1

prop1 = (length(subsample1)/length(sample1))*100
prop1
```

```
> subsample1
  [1] 172.4933 214.6137 205.0229 214.7106 220.9147 185.0678 182.0590 186.8443 195.7854 221.9731 202.2604 206.7260 204.2922 212.9244 180.3367 208.0867
 [17] 209.8719 213.1990 228.1051 184.1207 210.2882 179.0287 211.6928 183.8870 226.8126 221.7931 201.0457 215.4437 183.5071 203.0386 215.7754 171.8405
 [33] 184.8691 190.4825 210.8765 175.1636 209.5700 205.4608 188.7492 195.3380 214.3991 180.8348 205.1625 191.4100 192.4578 226.1267 224.2855 227.8363
 [49] 209.7003 201.7948 219.6695 198.9071 173.1655 220.4728 205.4803 178.8273 220.9615 228.0483 186.2974 217.7262 193.0861 215.0661 225.7518 190.5532
 [65] 206.0192 180.0434 176.2054 190.1033 196.3993 183.2737 188.9333 201.4634 211.4040 193.6312 181.1861 171.5617 170.6641 200.1109 223.6566 203.0867
 [81] 225.8487 201.0879 212.2681 188.9433 197.2865 188.7770 179.7014 202.1843 227.7791 176.3644 196.1296 220.1661 211.2863 185.5673 202.3043 185.9075
 [97] 190.0511 225.7007 185.8960 192.1451 220.3703 202.7203 220.3965 200.7842 189.0534 206.1303 197.7622 207.1114 182.8566 185.7781 221.7245 192.7433
[113] 201.2259 207.6124 200.9333 226.2205 196.1255 187.2049 213.0526 177.5223 204.4966 206.5965 214.6965 204.5041 185.5183 227.0711 202.1830 229.8535
[129] 213.3048 225.7098 207.1635 183.5585 200.7365 222.4626 191.1675 223.6028 192.4614 194.3994 210.6612 214.3812 208.3496 213.3270 213.5427 184.6282
[145] 176.8206 193.6130 228.3870 189.1120 170.0065 214.7797 191.5325 186.0989 213.2412 216.9506 202.1985 226.8787 191.6007 227.0977 203.0329 219.5350
[161] 180.7759 177.3417 200.4156 193.8483 170.2543 211.9379 174.1942 227.1689 203.3180 174.9323 197.3989 208.0898 183.5859 194.3309 185.1268 201.0294
[177] 224.9823 221.9355 179.7214 216.5338 173.7069 186.2963 212.1562 217.5537 219.5977 211.1897 196.2220 171.7347 220.7526 182.9523 195.6804 217.3637
[193] 207.1686 192.4898 186.0112 202.4429 211.7357 210.9206 187.1600 171.9128 213.1228 224.3294 179.8894 195.1785 182.3510 171.2543 190.3185 220.7451
[209] 196.8864 229.9294 182.7412 178.5700 200.9452 207.3309 188.0191 178.5122 224.7342 194.7349 198.8382 216.2417 216.8286 179.0725 197.7875 184.0592
[225] 202.3931 206.8000 180.3568 200.8942 204.4233 185.0636 229.1247 221.4769 229.5452 213.0747 216.9829 189.1865 188.9007 189.4620 215.7020 182.7272
[241] 197.6107 210.0195 221.0452 214.0360 212.3959 227.3284 172.7840 212.8723 197.8637 198.9984 183.4923 182.3163 219.3665 210.2048 191.4501 211.5441
[257] 177.8220 219.1315 170.9683 219.4242 217.1289 217.1082 227.8605 213.1295 199.9529 229.2743 196.1483 174.7964 199.5162 193.9669 195.0241 188.3302
[273] 207.7469 185.8826 219.0480 187.0599 178.9205 177.6120 190.8961 201.1059 208.3847 193.9168 181.5264 191.4219 182.7018 193.6580 209.0158 227.7291
[289] 201.1015 174.8071 200.3114 172.9357 184.1125 205.5432 183.0360 213.6010 180.8558 216.3739 218.9110 211.9595 215.1062 193.5214 225.7002 197.3749
[305] 178.6733 189.2911 176.9346 222.7801 195.6090 228.3398 187.4235 186.3058 196.4095 202.7663 186.8167 171.9339 219.5742 187.6746 206.8261 193.9139
[321] 202.2359 205.1113 184.0071 174.9774 207.9846 229.3182 191.4055 227.2340 205.2859 222.1094 202.7929 229.2953 199.5565 216.1013 207.1163 176.5846
[337] 187.6673

> prop1 = (length(subsample1)/length(sample1))*100

> prop1
[1] 67.4
```

- Cree un conjunto de datos naranjas que representen 300 naranjas elegidas al azar, siguiendo la distribución mencionada.

```
18  #3
19  n_nar = 300
20  stdv_nar = 45
21  media_nar = 150
22
23  sample2 = rnorm(n_nar, media_nar, stdv_nar)
24  sample2
```

```
> sample2
  [1] 149.03914 161.07732 162.44401 207.56294 187.69896 213.13986 142.15309 142.45796 194.43837 154.68474 232.64289 148.82935 218.28146 188.86893
 [15] 126.05957 186.82427 141.19961 194.00393  97.43461 110.73003 190.80171 149.83479 205.94027 131.47993 156.95369 134.74363 129.86051 188.99509
 [29] 168.10540 205.45731 119.55542 217.46036 233.93971 106.77204 135.55975 109.23716 144.57555  68.22230 169.10968 152.81415 258.28573 136.00714
 [43]  85.89654 242.41185 129.74920 258.78475 148.47007 187.35987 144.28588 209.19747 122.87650  81.36829 202.60975  71.62804 145.90925 135.76206
 [57] 203.66205 158.09623 119.00724 131.47142 186.23975  89.10982 141.76368 202.57030 144.83691 105.11374 106.94263  68.66919 167.39239 274.22894
 [71] 196.03991 170.97028 180.39925 162.50595 123.62833 129.21339 150.37817 138.80895 127.65308 204.12115 234.03764 141.47999 182.45993 103.79043
 [85] 195.12683 233.61013 147.14134 156.33814 183.88960 208.17912  81.82886 151.95467 129.59292 210.55752 172.08863 176.88140 195.70867 120.06235
 [99] 110.71424 183.84089 202.92416 114.94265 168.11601 195.99924 118.40199 128.51184 163.99224 119.51708 123.59049 198.12273 214.77376 107.69541
[113] 106.25573 190.90706 124.37500 172.16801  80.64048 106.01588  45.81463 190.18912 110.32490 115.71737 160.11659 187.70234  63.19657 164.22374
[127] 183.91138 128.61758 102.10143  95.37158 200.93575 187.54489 167.06785  93.71986 219.47998 166.24873 162.43186  78.25554 109.11091 148.87607
[141]  62.52144 142.37775 199.12750 248.49277 128.94851 133.87550 194.35797 215.45295 208.44826 129.01253 154.71222  80.67849 211.10474  62.94186
[155] 127.61060 161.43741 105.12302 168.97348 103.52354 199.11532 119.70449 209.30704 158.03596 130.15077 159.58612 161.00273 165.37082 120.60473
[169]  85.56613 154.89697 122.98329 130.54080 249.40572 117.50615 120.57681 257.11592 103.67272  68.94362 107.37108 127.84331 206.13615 155.34064
[183] 201.48885 100.16202 170.87847 184.43393 284.69880 253.03453 132.90577 100.94935 129.14593 108.42468 130.89344 185.83060 145.07586 137.64334
[197] 145.00597 125.49834 157.43404 119.49978 136.32924 136.90631 158.04806 221.16940 117.96929 145.39127 143.87684  81.50277 122.96673 165.84415
[211] 164.78576 100.47382 113.93333 129.30522 220.53035 157.84917  88.92336 105.86944  63.38855 195.76306 222.94367 168.61573 162.53620 164.56336
[225] 139.81536 167.50299 101.44267 105.96951  92.46771 106.63264 135.88946 181.03763 151.00445 101.21996 201.06530 157.24929 150.39988 228.50198
[239] 165.13852  77.70048  96.26626 120.91625 134.64711  78.57749 131.22994 162.75590 182.16972  97.06319 118.39173 226.81519 107.76477 179.32292
[253] 127.58617 165.28918 202.40387  98.83315 196.96417  54.45986 150.16468 153.06309 204.18825  50.80371 125.16659  97.54153 199.56808 123.14675
[267] 101.49062 140.35608 110.97402 148.97152 231.13897  27.65988 184.07205 123.34864 160.40864 161.52738 125.81929 142.82467 175.12855 133.17536
[281] 145.91932 147.01664  43.63938 242.98231 139.85243 117.65499  79.68250 161.40317  57.44784  94.68949 116.76729 176.68453 156.86051 185.65645
[295] 184.79078 154.73271 110.33924 145.85387 165.33763 140.53705
```

- Seleccione todas las naranjas que pesen entre 105 y 195 g. Calcule el porcentaje que representan las manzanas seleccionadas.

```
#4
subsample2 = sample2[sample2<195]
subsample2 = subsample2[subsample2>105]
subsample2

prop2 = (length(subsample2)/length(sample2))*100
prop2
```

```
> subsample2
  [1] 149.0391 161.0773 162.4440 187.6990 142.1531 142.4580 194.4384 154.6847 148.8294 188.8689 126.0596 186.8243 141.1996 194.0039 110.7300 190.8017
 [17] 149.8348 131.4799 156.9537 134.7436 129.8605 188.9951 168.1054 119.5554 106.7720 135.5597 109.2372 144.5755 169.1097 152.8141 136.0071 129.7492
 [33] 148.4701 187.3599 144.2859 122.8765 145.9093 135.7621 158.0962 119.0072 131.4714 186.2397 141.7637 144.8369 105.1137 106.9426 167.3924 170.9703
 [49] 180.3992 162.5059 123.6283 129.2134 150.3782 138.8089 127.6531 141.4800 182.4599 147.1413 156.3381 183.8896 151.9547 129.5929 172.0886 176.8814
 [65] 120.0624 110.7142 183.8409 114.9427 168.1160 118.4020 128.5118 163.9922 119.5171 123.5905 107.6954 106.2557 190.9071 124.3750 172.1680 106.0159
 [81] 190.1891 110.3249 115.7174 160.1166 187.7023 164.2237 183.9114 128.6176 187.5449 167.0678 166.2487 162.4319 109.1109 148.8761 142.3778 128.9485
 [97] 133.8755 194.3580 129.0125 154.7122 127.6106 161.4374 105.1230 168.9735 119.7045 158.0360 130.1508 159.5861 161.0027 165.3708 120.6047 154.8970
[113] 122.9833 130.5408 117.5062 120.5768 107.3711 127.8433 155.3406 170.8785 184.4339 132.9058 129.1459 108.4247 130.8934 185.8306 145.0759 137.6433
[129] 145.0060 125.4983 157.4340 119.4998 136.3292 136.9063 158.0481 117.9693 145.3913 143.8768 122.9667 165.8441 164.7858 113.9333 129.3052 157.8492
[145] 105.8694 168.6157 162.5362 164.5634 139.8154 167.5030 105.9695 106.6326 135.8895 181.0376 151.0044 157.2493 150.3999 165.1385 120.9163 134.6471
[161] 131.2299 162.7559 182.1697 118.3917 107.7648 179.3229 127.5862 165.2892 150.1647 153.0631 125.1666 123.1467 140.3561 110.9740 148.9715 184.0720
[177] 123.3486 160.4086 161.5274 125.8193 142.8247 175.1286 133.1754 145.9193 147.0166 139.8524 117.6550 161.4032 116.7673 176.6845 156.8605 185.6565
[193] 184.7908 154.7327 110.3392 145.8539 165.3376 140.5371

> prop2 = (length(subsample2)/length(sample2))*100

> prop2
[1] 66
```

Tanto en el ejercicio 2 como el 4, los límites están establecidos a una desviación estándar de sus respectivas medias, por lo que, de acuerdo a las características de la distribución normal, en este rango se encontrarán alrededor del 68% de los datos, lo que explica los resultados obtenidos de 67.4% y 66% respectivamente.