

# Assignment 1

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```
x <- scan("read_this_1.txt")

length(x)

## [1] 21

sum(x)

## [1] 67

mean(x)

## [1] 3.190476

csv <- read.csv("read_this_1.csv")
```

## Basic R Exercise 1

1.

```
a <- c(1:20)
b <- c(20:1)
c <- c(1:19,20,19:1)
tmp <-c(4,6,3)
e <- rep(tmp, times = 10)
f <- rep(tmp, times = 10, length = 31)
g <- rep(tmp, times=c(10,20,30))
```

2.

```
x <- seq(3, 6, by=.1)
Q2 <- (exp(1)^x)*cos(x)
```

3.

(a)

```
Q3A_num <- c(1:12)
Q3A <-((0.1^(3*Q3A_num))*(0.2^(-2+3*Q3A_num)))
```

(b)

```
Q3B_num <- c(1:25)
Q3B <- ((2^Q3B_num)/Q3B_num)
```

4.

(a)

```
Q4A_num <- c(10:100)
sum((Q4A_num^3) + 4 * (Q4A_num^2))
```

```
## [1] 26852735
```

(b)

```
Q4B_num <- c(1:25)
sum(( 2^Q4B_num) / Q4B_num) + ( (3^Q4B_num) / (Q4B_num^2))
```

```
## [1] 2129170437
```

5 (a)

```
Q5A <- paste(c("label "), 1:30)
```

(b)

```
Q5B <- paste(c("fn"), 1:30, sep = "")
```

6.

```
set.seed(50)
xVec <- sample(0:999, 250, replace = T)
yVec <- sample(0:999, 250, replace = T)
```

(a)

```
Q6A <- yVec[-1] - xVec[-length(xVec)]
```

(b)

```
Q6B <- (sin(yVec[-length(yVec)]))/cos(xVec[-1])
```

(c)

```
Q6C <- xVec[-c(249,250)] + 2*xVec[-c(1,250)]-xVec[-c(1,2)]
```

(d)

```
sum( (exp(1)^(-xVec[-1])) / (xVec[-length(xVec)] + 10))
```

```
## [1] 0.01269872
```

7.

(a)

```
yVec[yVec>600]
```

```
## [1] 709 871 621 930 948 783 878 671 860 768 698 974 855 813 776 721 917
## [18] 985 705 884 840 687 957 955 786 938 930 641 615 988 881 881 997 823
## [35] 791 643 779 693 845 815 752 766 635 993 919 686 635 613 660 800 743
## [52] 965 743 615 615 803 948 760 604 800 772 863 902 689 881 941 924 693
## [69] 835 632 872 876 850 961 681 791 947 915 712 665 921 798 866 828 942
## [86] 841 645 681 827 884 890 970 632 717 846 952 609 824 695 675 777 813
## [103] 792 783 611 853 738 668 791
```

(b)

```
which(yVec > 600)
```

```
## [1] 1 2 5 6 8 10 11 13 16 18 27 28 32 33 34 36 42
## [18] 43 45 48 50 55 58 59 60 61 63 66 67 68 72 79 80 86
## [35] 88 94 95 96 97 101 102 105 107 109 111 114 118 119 120 123 125
## [52] 127 131 132 134 136 137 138 139 142 143 150 151 154 157 158 159 161
## [69] 163 164 167 168 172 173 174 175 176 178 180 181 182 183 187 189 190
## [86] 203 204 205 206 211 213 214 219 220 224 226 227 230 232 237 238 239
```

```
## [103] 241 243 245 246 247 249 250
```

(c)

```
xVec[which(yVec>600)]
```

```
## [1] 708 437 513 44 646 107 390 640 676 364 577 257 408 437 618 627 836
## [18] 278 55 458 803 358 525 511 266 578 197 38 724 61 995 652 956 19
## [35] 680 760 48 294 69 505 964 24 10 840 878 113 789 444 986 537 515
## [52] 263 359 189 457 274 543 324 176 160 260 407 216 977 148 293 660 137
## [69] 852 743 353 371 768 339 203 478 49 880 996 894 357 900 972 467 324
## [86] 517 446 533 190 501 124 14 5 863 399 256 678 188 258 110 957 285
## [103] 34 631 179 545 123 238 178
```

(d)

```
Q7D <- sqrt(abs(xVec - mean(xVec)))
```

(e)

```
sum(yVec>(max(yVec)-200))
```

```
## [1] 57
```

(f)

```
sum(xVec %% 2 == 0)
```

```
## [1] 124
```

(g)

```
xVec[order(yVec)]
```

```
## [1] 405 842 308 572 461 8 256 507 373 639 42 616 29 645 376 669 688
## [18] 197 63 638 862 77 996 93 59 585 661 72 339 20 206 537 174 322
## [35] 42 603 425 48 707 452 477 99 224 811 715 358 963 222 395 543 480
## [52] 193 683 710 691 954 700 614 787 835 275 435 309 368 224 460 497 944
## [69] 530 765 523 171 870 807 469 828 624 200 713 365 781 74 129 76 701
## [86] 760 193 866 353 168 967 545 920 541 650 148 277 18 667 865 987 120
## [103] 655 1 554 699 311 458 632 84 269 82 280 544 17 621 807 113 136
## [120] 457 702 91 625 767 828 109 860 363 121 657 668 324 382 956 299 403
## [137] 74 928 415 38 127 176 678 179 444 724 189 457 513 743 5 10 789
## [154] 38 760 446 986 894 238 640 110 203 533 113 358 977 294 137 258 577
## [171] 55 708 996 863 627 123 515 359 964 324 24 364 260 618 957 48 107
## [188] 631 266 680 478 178 34 900 537 160 274 437 285 505 19 188 190 467
## [205] 852 803 517 69 399 768 545 408 676 407 972 437 353 371 390 995 652
## [222] 148 458 501 124 216 880 836 878 357 660 44 197 578 293 324 49 646
## [239] 543 256 511 525 339 263 14 257 278 61 840 956
```

(h)

```
yVec[c(T,F,F)]
```

```
## [1] 709 517 437 783 671 860 581 347 279 974 216 776 538 460 985 248 317
## [18] 288 687 957 938 101 615 285 106 414 881 488 484 791 246 643 845 553
## [35] 465 87 993 116 473 635 310 428 965 19 489 803 604 800 175 516 902
## [52] 689 881 593 835 398 358 850 791 915 665 167 866 942 320 482 216 488
## [69] 681 273 884 970 469 717 127 952 284 695 325 777 792 72 738 791
```

8.

```
1+sum(cumprod(seq(2,38, by = 2)/seq(3,39, by = 2)))
```

```
## [1] 6.976346
```