

Worksheet-1 in R

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1.

a. How many data points? +There are 34 data points.

b. Write the R code and its output.

```
age <- c(34, 28, 22, 36, 27, 18, 52, 39, 42, 29, 35, 31, 27, 22, 37, 34, 19, 20, 57, 49, 50, 37, 46, 25, 34, 28, 22, 36, 27, 18, 52, 39, 42, 29, 35, 31, 27, 22, 37, 34, 19, 20, 57, 49, 50, 37, 46, 25)

points <- length(age)

print(points)

## [1] 34
```

2. Find the reciprocal of the values for age.

```
reciprocal_age <- 1 / age

print(reciprocal_age)

## [1] 0.02941176 0.03571429 0.04545455 0.02777778 0.03703704 0.05555556
## [7] 0.01923077 0.02564103 0.02380952 0.03448276 0.02857143 0.03225806
## [13] 0.03703704 0.04545455 0.02702703 0.02941176 0.05263158 0.05000000
## [19] 0.01754386 0.02040816 0.02000000 0.02702703 0.02173913 0.04000000
## [25] 0.05882353 0.02702703 0.02380952 0.01886792 0.02439024 0.01960784
## [31] 0.02857143 0.04166667 0.03030303 0.02439024
```

3. What happened to the new_age? +It duplicates the age vector with 0 in the middle.

```
new_age <- c(age, 0, age)

print(new_age)

## [1] 34 28 22 36 27 18 52 39 42 29 35 31 27 22 37 34 19 20 57 49 50 37 46 25 17
## [26] 37 42 53 41 51 35 24 33 41 0 34 28 22 36 27 18 52 39 42 29 35 31 27 22 37
## [51] 34 19 20 57 49 50 37 46 25 17 37 42 53 41 51 35 24 33 41
```

4. Sort the values for age

```
sortAge <- sort(age)

print(sortAge)

## [1] 17 18 19 20 22 22 24 25 27 27 28 29 31 33 34 34 35 35 36 37 37 37 39 41 41
## [26] 42 42 46 49 50 51 52 53 57
```

5. Find the minimum and maximum value for age.

```
minAge <- min(age)
minAge
```

```
## [1] 17
```

```
maxAge <- max(age)
maxAge
```

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

6.

a. How many data points? +There are 12 data points.

b. Write the R code and its output.

```
data <- c(2.4, 2.8, 2.1, 2.5, 2.4, 2.2, 2.5, 2.3, 2.5, 2.3, 2.4, 2.7)
```

```
points <- length(data)
```

```
print(points)
```

```
## [1] 12
```

7. Generate a new vector for data where you double every value of the data. What happen to the data?
+The data were increased by two.

```
double_data <- data * 2
```

```
print(double_data)
```

```
## [1] 4.8 5.6 4.2 5.0 4.8 4.4 5.0 4.6 5.0 4.6 4.8 5.4
```

8. Generate a sequence for the following scenario: 8.1 Integers from 1 to 100.

```
sequence <- seq(1, 100)
```

```
print(sequence)
```

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

8.2 Numbers from 20 to 60

```
n <- seq(20, 60)
```

```
print(n)
```

```
## [1] 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44
## [26] 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
```

8.3 Mean of numbers from 20 to 60

```
numSeq <- seq(20, 60)
```

```
meanNum <- mean(numSeq)
```

```
print(meanNum)
```

```
## [1] 40
```

8.4 Sum of numbers from 51 to 91

```
numsum <- sum(seq(51, 91))
numsum
```

```
## [1] 2911
```

8.5 Integers from 1 to 1,000

```
s <- seq(1:1000)

print(s)
```

```
##      [1]      1      2      3      4      5      6      7      8      9     10     11     12     13     14
##     [15]     15     16     17     18     19     20     21     22     23     24     25     26     27     28
##     [29]     29     30     31     32     33     34     35     36     37     38     39     40     41     42
##     [43]     43     44     45     46     47     48     49     50     51     52     53     54     55     56
##     [57]     57     58     59     60     61     62     63     64     65     66     67     68     69     70
##     [71]     71     72     73     74     75     76     77     78     79     80     81     82     83     84
##     [85]     85     86     87     88     89     90     91     92     93     94     95     96     97     98
##     [99]     99    100    101    102    103    104    105    106    107    108    109    110    111    112
##    [113]    113    114    115    116    117    118    119    120    121    122    123    124    125    126
##    [127]    127    128    129    130    131    132    133    134    135    136    137    138    139    140
##    [141]    141    142    143    144    145    146    147    148    149    150    151    152    153    154
##    [155]    155    156    157    158    159    160    161    162    163    164    165    166    167    168
##    [169]    169    170    171    172    173    174    175    176    177    178    179    180    181    182
##    [183]    183    184    185    186    187    188    189    190    191    192    193    194    195    196
##    [197]    197    198    199    200    201    202    203    204    205    206    207    208    209    210
##    [211]    211    212    213    214    215    216    217    218    219    220    221    222    223    224
##    [225]    225    226    227    228    229    230    231    232    233    234    235    236    237    238
##    [239]    239    240    241    242    243    244    245    246    247    248    249    250    251    252
##    [253]    253    254    255    256    257    258    259    260    261    262    263    264    265    266
##    [267]    267    268    269    270    271    272    273    274    275    276    277    278    279    280
##    [281]    281    282    283    284    285    286    287    288    289    290    291    292    293    294
##    [295]    295    296    297    298    299    300    301    302    303    304    305    306    307    308
##    [309]    309    310    311    312    313    314    315    316    317    318    319    320    321    322
##    [323]    323    324    325    326    327    328    329    330    331    332    333    334    335    336
##    [337]    337    338    339    340    341    342    343    344    345    346    347    348    349    350
##    [351]    351    352    353    354    355    356    357    358    359    360    361    362    363    364
##    [365]    365    366    367    368    369    370    371    372    373    374    375    376    377    378
##    [379]    379    380    381    382    383    384    385    386    387    388    389    390    391    392
##    [393]    393    394    395    396    397    398    399    400    401    402    403    404    405    406
##    [407]    407    408    409    410    411    412    413    414    415    416    417    418    419    420
##    [421]    421    422    423    424    425    426    427    428    429    430    431    432    433    434
##    [435]    435    436    437    438    439    440    441    442    443    444    445    446    447    448
##    [449]    449    450    451    452    453    454    455    456    457    458    459    460    461    462
##    [463]    463    464    465    466    467    468    469    470    471    472    473    474    475    476
##    [477]    477    478    479    480    481    482    483    484    485    486    487    488    489    490
##    [491]    491    492    493    494    495    496    497    498    499    500    501    502    503    504
##    [505]    505    506    507    508    509    510    511    512    513    514    515    516    517    518
##    [519]    519    520    521    522    523    524    525    526    527    528    529    530    531    532
##    [533]    533    534    535    536    537    538    539    540    541    542    543    544    545    546
##    [547]    547    548    549    550    551    552    553    554    555    556    557    558    559    560
##    [561]    561    562    563    564    565    566    567    568    569    570    571    572    573    574
##    [575]    575    576    577    578    579    580    581    582    583    584    585    586    587    588
```

```
## [589] 589 590 591 592 593 594 595 596 597 598 599 600 601 602
## [603] 603 604 605 606 607 608 609 610 611 612 613 614 615 616
## [617] 617 618 619 620 621 622 623 624 625 626 627 628 629 630
## [631] 631 632 633 634 635 636 637 638 639 640 641 642 643 644
## [645] 645 646 647 648 649 650 651 652 653 654 655 656 657 658
## [659] 659 660 661 662 663 664 665 666 667 668 669 670 671 672
## [673] 673 674 675 676 677 678 679 680 681 682 683 684 685 686
## [687] 687 688 689 690 691 692 693 694 695 696 697 698 699 700
## [701] 701 702 703 704 705 706 707 708 709 710 711 712 713 714
## [715] 715 716 717 718 719 720 721 722 723 724 725 726 727 728
## [729] 729 730 731 732 733 734 735 736 737 738 739 740 741 742
## [743] 743 744 745 746 747 748 749 750 751 752 753 754 755 756
## [757] 757 758 759 760 761 762 763 764 765 766 767 768 769 770
## [771] 771 772 773 774 775 776 777 778 779 780 781 782 783 784
## [785] 785 786 787 788 789 790 791 792 793 794 795 796 797 798
## [799] 799 800 801 802 803 804 805 806 807 808 809 810 811 812
## [813] 813 814 815 816 817 818 819 820 821 822 823 824 825 826
## [827] 827 828 829 830 831 832 833 834 835 836 837 838 839 840
## [841] 841 842 843 844 845 846 847 848 849 850 851 852 853 854
## [855] 855 856 857 858 859 860 861 862 863 864 865 866 867 868
## [869] 869 870 871 872 873 874 875 876 877 878 879 880 881 882
## [883] 883 884 885 886 887 888 889 890 891 892 893 894 895 896
## [897] 897 898 899 900 901 902 903 904 905 906 907 908 909 910
## [911] 911 912 913 914 915 916 917 918 919 920 921 922 923 924
## [925] 925 926 927 928 929 930 931 932 933 934 935 936 937 938
## [939] 939 940 941 942 943 944 945 946 947 948 949 950 951 952
## [953] 953 954 955 956 957 958 959 960 961 962 963 964 965 966
## [967] 967 968 969 970 971 972 973 974 975 976 977 978 979 980
## [981] 981 982 983 984 985 986 987 988 989 990 991 992 993 994
## [995] 995 996 997 998 999 1000
```

a. How many data points from 8.1 to 8.4? +There are 143 data points.

```
length1 <- length(sequence)
length2 <- length(n)
length3 <- length(meanNum)
length4 <- length(numsum)
sum (length1+length2+length3+length4)
```

```
## [1] 143
```

b. Write the R code and its output from 8.1 to 8.4.

```
sequence <- seq(1:100)
n <- seq(20:60)
meanNum <- mean(20:60)
numsum <- sum(51:91)
```

c. For 8.5 find only maximum data points until 10.

```
m <- 1:1000
ans <- max(m[t <- 10])
ans
```

```
## [1] 10
```

9. Print a vector with the integers between 1 and 100 that are not divisible by 3, 5 and 7 using filter option.

```
Filter(function(i) { all(i %% c(3,5,7) != 0) }, seq(100))
```

```
## [1] 1 2 4 8 11 13 16 17 19 22 23 26 29 31 32 34 37 38 41 43 44 46 47 52 53
## [26] 58 59 61 62 64 67 68 71 73 74 76 79 82 83 86 88 89 92 94 97
```

10. Generate a sequence backwards of the integers from 1 to 100.

```
bckwrd <- seq(100, 1, by = -1)
```

```
print(bckwrd)
```

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

11. List all the natural numbers below 25 that are multiples of 3 or 5. Find the sum of these multiples.

```
numbers <- 1:24
```

```
multiples <- numbers[numbers %% 3 == 0 | numbers %% 5 == 0]
print(multiples)
```

```
## [1] 3 5 6 9 10 12 15 18 20 21 24
```

```
sum <- sum(multiples)
print(sum)
```

```
## [1] 143
```

a. How many data points from 10 to 11? +There are 12 data points.

b. Write the R code and its output from 10 and 11.

```
dp10 <- length(multiples)
dp11 <- 1
```

```
total <- dp10 + dp11
total
```

```
## [1] 12
```

13. Find x[2] and x[3]. Write the R code and its output.

```
score <- c(72, 86, 92, 63, 88, 89, 91, 92, 75,
75, 77)
```

```
x2 <- score[2]
x3 <- score[3]
```

```
print(x2)
```

```
## [1] 86
```

```
print(x3)
```

```
## [1] 92
```

14. Create a vector `a = c(1,2,NA,4,NA,6,7)`. a. Change the NA to 999 using the codes `print(a,na.print="-999")`.
b. Write the R code and its output. Describe the output. +The output displays the vector 'a' with NA values being replaced by '-999'. The values of a in memory remain the same.

```
a <- c(1,2,NA,4,NA,6,7)
```

```
print(a, na.print = "-999")
```

```
## [1] 1 2 -999 4 -999 6 7
```

15.

```
name = readline(prompt="Input your name: ")
```

```
## Input your name:
```

```
age = readline(prompt="Input your age: ")
```

```
## Input your age:
```

```
print(paste("My name is",name, "and I am",age ,"years old."))
```

```
## [1] "My name is  and I am  years old."
```

```
print(R.version.string)
```

```
## [1] "R version 4.4.1 (2024-06-14)"
```

What is the output of the above code? +I input my name and my age and it shows as this, "My name is trexan sanico and I am 19 years old."