

RWorksheet_berja#1.Rmd.

Forge

2024-09-04

Set up a vector named age, consisting of 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, 37, 42, 53, 41, 51, 35, 24, 33, 41.

a. How many data points?

-There are 34 data points in total.

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, 17, 37, 42, 53, 41, 51,
        35, 24, 33, 41)
length(age)
```

```
## [1] 34
```

2. Find the reciprocal of the values for age

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, 17, 37, 42, 53, 41, 51,
        35, 24, 33, 41)
```

```
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
```

a. How many data points in from 8.1 to 8.4?

3. Assign also new_age <- c(age, 0, age).

```
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, 17, 37, 42, 53, 41, 51,
        35, 24, 33, 41)
```

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

What happen to the new_age?

The vectors are concatenated using the `c()` function to produce the new_age vector, which has 69 components: the first 34 elements from the age vector, one 0 element, and the remaining 34 elements from the age vector that are duplicates.

4. Sort the values for age.

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, 17, 37, 42, 53, 41, 51,
        35, 24, 33, 41)

sorted_age <- sort(age)

print(sorted_age)

## [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.

Write the R code and its output.

```
min_value <- min(age)

max_value <- max(age)

print(paste("Minimum value:", min_value))

## [1] "Minimum value: 17"

print(paste("Maximum value:", max_value))

## [1] "Maximum value: 57"
```

6. Set up a vector named data, consisting of 2.4, 2.8, 2.1, 2.5, 2.4, 2.2, 2.5, 2.3, 2.5, 2.3, 2.4, and 2.7.

a. How many data points?

-There are 12 data points in total.

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)

print(data)

## [1] 2.4 2.8 2.1 2.5 2.4 2.2 2.5 2.3 2.5 2.3 2.4 2.7
```

7

. Generates a new vector for data where you double every value of the data. | What happen to the data?

```
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)
```

```
doubled_data <- data * 2
```

```
print(doubled_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
```

-The data given to us was doubled because of the codes we inputted into it which makes the given data doubled its output by 2.

8. Generate a sequence for the following scenario:

*8.1 Integers from 1 to 100.

```
sequence_1_to_100 <- seq(from = 1, to = 100)
```

```
print(sequence_1_to_100)
```

```
## [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

```
sequence_20_to_60 <- 20:60
```

```
print(sequence_20_to_60)
```

```
## [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

```
sequence_20_to_60 <- 20:60
```

```
mean_value <- mean(sequence_20_to_60)
```

```
print(mean_value)
```

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

*8.4 Sum of numbers from 51 to 91

```
sequence_51_to_91 <- 51:91

sum_value <- sum(sequence_51_to_91)

print(sum_value)

## [1] 2911
```

*8.5 Integers from 1 to 1,000

```
sequence_1_to_1000 <- 1:1000

print(sequence_1_to_1000)
```

```
##      [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 from 8.1 to 8.4.

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

8.1

```
sequence_1_to_100 <- seq(from = 1, to = 100)
print(sequence_1_to_100)
```

```
## [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

```
sequence_20_to_60 <- 20:60

print(sequence_20_to_60)

## [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

```
sequence_20_to_60 <- 20:60

mean_value <- mean(sequence_20_to_60)

print(mean_value)
```

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

8.4

```
sequence_51_to_91 <- 51:91

sum_value <- sum(sequence_51_to_91)

print(sum_value)
```

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

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

```
sequence_1_to_1000 <- 1:1000

limit <- 10

filtered_sequence <- sequence_1_to_1000[sequence_1_to_1000 <= limit]

print(filtered_sequence)
```

```
## [1] 1 2 3 4 5 6 7 8 9 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))
```

Write the R code and its output

```
sequence_1_to_100 <- seq(100)

filtered_sequence <- Filter(function(i) { all(i %% c(3, 5, 7) != 0) }, sequence_1_to_100)

print(filtered_sequence)
```

```
## [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.

Write the R code and its output

```
sequence_1_to_100 <- 1:100
```

```
reversed_sequence <- rev(sequence_1_to_100)
```

```
print(reversed_sequence)
```

```
## [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 multipliers

```
numbers_below_25 <- 1:24
```

```
multiples_of_3_or_5 <- numbers_below_25[numbers_below_25 %% 3 == 0 | numbers_below_25 %% 5 == 0]
```

```
sum_of_multiples <- sum(multiples_of_3_or_5)
```

```
print(multiples_of_3_or_5)
```

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

```
print(sum_of_multiples)
```

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

a. How many data points from 10 to 11?

-There are 112 data points from 10 to 11.

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

10.

```
sequence_1_to_100 <- 1:100
```

```
reversed_sequence <- rev(sequence_1_to_100)
```

```
print(reversed_sequence)
```

```
## [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

```
.  
numbers_below_25 <- 1:24  
  
multiples_of_3_or_5 <- numbers_below_25[numbers_below_25 %% 3 == 0 | numbers_below_25 %% 5 == 0]  
  
sum_of_multiples <- sum(multiples_of_3_or_5)  
  
print(multiples_of_3_or_5)  
  
## [1] 3 5 6 9 10 12 15 18 20 21 24  
print(sum_of_multiples)  
  
## [1] 143
```

12. Statements can be grouped together using braces '{' and '}'. A group of statements is sometimes called a block. Single statements are evaluated when a new line is typed at the end of the syntactically complete statement. Blocks are not evaluated until a new line is entered after the closing brace.

Enter this statement:

```
x <- {0 + x + 5 + }
```

Describe the output.

```
#Error: unexpected '}' in "x <- {0 + x + 5 +"
```

The trailing + in the original expression `x <- {0 + x + 5 + }` causes a syntax error. The problem can be fixed and the phrase can be evaluated correctly by taking out the + and making sure it is complete.

13. *Set up a vector named score, consisting of 72, 86, 92, 63, 88, 89, 91, 92, 75, 75 and 77. To access individual elements of an atomic vector, one generally uses the `x[i]` construction.

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)  
score[2]
```

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

```
score[3]
```

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

*Create a vector `a = c(1,2,NA,4,NA,6,7)`.

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

- a. Change the NA to 999 using the codes `print(a,na.print="-999")`.

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

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

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


b. Write the R code and its output. Describe the output.

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

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

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

The vector `a` is shown with NA values rendered as -999 for display purposes using the `print(a, na.print="-999")` command this approach might be helpful for reporting or visualization.

15. A special type of function calls can appear on the left hand side of the assignment operator as in `> class(x) <- "foo"`.

Follow the codes below:

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

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

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

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

What is the output of the above code?

```
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)"
```