Homework 4

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8/23/2021

###Section 1

1. Create a vector called `letters.in.name` that has the number of letters in your first name, your middle name and last name. This would be Kopeikin's answer:

```
#Carey Jason Kopeikin
letters.in.name <- c(5, 5, 8)
```

Now make your own:

```
letters.in.name <- c(4, 5)
```

2. Create a logical vector that is true if the name is longer than 5 letters and false if it is shorter. Do this in the two ways explained below.

a. Method 1: create the vector `is.longer.than.5.method.1` and for each of the names manually type in TRUE if it is longer than 5 and FALSE if not (there should be a true or false for each of the names).

```
is.longer.than.5.method.1 = c(FALSE, FALSE)
```

b. b. Method 2: create the vector `is.longer.than.5.method.2` and use *logical tests* to evaluate if each of your names are longer than 5.

```
is.longer.than.5.method.2 = letters.in.name > 5
```

3. Create the vector `some.numbers` and assign it these numbers 4, 8, 1, -3, 22. Then:

```
some.numbers = c(4, 8, 1, -3, 22)
```

a. sort the numbers from biggest to smallest.

```
some.numbers = sort(some.numbers, decreasing = TRUE)
```

b. sort the numbers from smallest to biggest.

```
some.numbers = sort(some.numbers, decreasing = FALSE)
```

c. find the number of elements in the vector using R.

```
length(some.numbers)
```

```
## [1] 5
```

d. display only the second element

```
some.numbers[2]
```

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

e. display the 3rd and last elements

```
some.numbers[c(3, length(some.numbers))]
```

```
## [1]  4 22
```

f. use a logical statement to print only the numbers less than 5.

```
some.numbers[some.numbers < 5]
```

```
## [1] -3  1  4
```

###Section 2

4. Read in the file `mariokart.csv` and save it as a data frame. Information about `mariokart.csv` can be found here: https://www.openintro.org/data/index.php?data=mariokart *You will need to go to that website to read about the data for some of these questions!*

```
mario.data = read.csv("mariokart.csv")
```

5. Display the first 6 observations.

```
head(mario.data)
```

```
##             id duration n_bids cond start_pr ship_pr total_pr    ship_sp
## 1 150377422259        3     20  new     0.99    4.00    51.55   standard
## 2 260483376854        7     13 used     0.99    3.99    37.04 firstClass
## 3 320432342985        3     16  new     0.99    3.50    45.50 firstClass
## 4 280405224677        3     18  new     0.99    0.00    44.00   standard
## 5 170392227765        1     20  new     0.01    0.00    71.00      media
## 6 360195157625        3     19  new     0.99    4.00    45.00   standard
##   seller_rate stock_photo wheels
## 1        1580         yes      1
## 2         365         yes      1
## 3         998          no      1
## 4           7         yes      1
## 5         820         yes      2
## 6      270144         yes      0
##                                                          title
## 1 ~~ Wii MARIO KART &amp;amp; WHEEL ~ NINTENDO Wii ~ BRAND NEW ~~
## 2     Mariokart Wii Nintendo with wheel - Mario Kart Nintendo
## 3                                        Mario Kart Wii (Wii)
## 4        Brand New Mario Kart Wii Comes with Wheel. Free Ship
## 5     BRAND NEW NINTENDO 1 WII MARIO KART WITH 2 WHEELS +GAME
## 6     Mario Kart Wii (GAME ONLY/NO WHEEL) - Nintendo Wii Game
```

6. Display the first 15 observations:

```
head(mario.data, 15)
```

```
##              id duration n_bids cond start_pr ship_pr total_pr    ship_sp
## 1  150377422259        3     20  new     0.99    4.00    51.55   standard
## 2  260483376854        7     13 used     0.99    3.99    37.04 firstClass
## 3  320432342985        3     16  new     0.99    3.50    45.50 firstClass
## 4  280405224677        3     18  new     0.99    0.00    44.00   standard
## 5  170392227765        1     20  new     0.01    0.00    71.00      media
## 6  360195157625        3     19  new     0.99    4.00    45.00   standard
## 7  120477729093        1     13 used     0.01    0.00    37.02   standard
## 8  300355501482        1     15  new     1.00    2.99    53.99  upsGround
## 9  200392065459        3     29 used     0.99    4.00    47.00   priority
## 10 330364163424        7      8 used    19.99    4.00    50.00 firstClass
```

```
## 11 290355805215        1     15  new     1.00    2.99    54.99  upsGround
## 12 180415462166        1     15  new     0.01    0.00    56.01      media
## 13 300353460362        1     13  new     1.00    2.99    48.00  upsGround
## 14 180415244903        1     16  new     0.01    0.00    56.00      media
## 15 250505391611        7      6 used    24.99    4.00    43.33   standard
##    seller_rate stock_photo wheels
## 1         1580         yes      1
## 2          365         yes      1
## 3          998          no      1
## 4            7         yes      1
## 5          820         yes      2
## 6       270144         yes      0
## 7         7284         yes      0
## 8         4858         yes      2
## 9           27         yes      1
## 10         201          no      1
## 11        4858         yes      2
## 12         820         yes      2
## 13        4858         yes      2
## 14         820         yes      2
## 15         154         yes      1
##                                                          title
## 1  ~~ Wii MARIO KART &amp;amp; WHEEL ~ NINTENDO Wii ~ BRAND NEW ~~
## 2      Mariokart Wii Nintendo with wheel - Mario Kart Nintendo
## 3                                        Mario Kart Wii (Wii)
## 4         Brand New Mario Kart Wii Comes with Wheel. Free Ship
## 5      BRAND NEW NINTENDO 1 WII MARIO KART WITH 2 WHEELS +GAME
## 6      Mario Kart Wii (GAME ONLY/NO WHEEL) - Nintendo Wii Game
## 7      Mario Kart Wii (Wii) Nintendo Wii game *--WOW --AWESOME
## 8                  BRAND NEW NINTENDO MARIO KART WITH 2 WHEELS
## 9        Wii game Mario Kart in box with 1 wheel Fast Shipping
## 10     Nintendo Wii : Mario Kart Wii w/ Wii Wheel (2008, MINT)
## 11                 BRAND NEW NINTENDO MARIO KART WITH 2 WHEELS
## 12     BRAND NEW NINTENDO 1 WII MARIO KART WITH 2 WHEELS +GAME
## 13                 BRAND NEW NINTENDO MARIO KART WITH 2 WHEELS
## 14     BRAND NEW NINTENDO 1 WII MARIO KART WITH 2 WHEELS +GAME
## 15                           Mario Kart Wii (Wii) w/ Wii Wheel
```

7. Display the structure of the data frame:

```
str(mario.data)
```

```
## 'data.frame':    143 obs. of  12 variables:
##  $ id         : num  1.5e+11 2.6e+11 3.2e+11 2.8e+11 1.7e+11 ...
##  $ duration   : int  3 7 3 3 1 3 1 1 3 7 ...
##  $ n_bids     : int  20 13 16 18 20 19 13 15 29 8 ...
##  $ cond       : chr  "new" "used" "new" "new" ...
##  $ start_pr   : num  0.99 0.99 0.99 0.99 0.01 ...
##  $ ship_pr    : num  4 3.99 3.5 0 0 4 0 2.99 4 4 ...
##  $ total_pr   : num  51.5 37 45.5 44 71 ...
##  $ ship_sp    : chr  "standard" "firstClass" "firstClass" "standard" ...
##  $ seller_rate: int  1580 365 998 7 820 270144 7284 4858 27 201 ...
##  $ stock_photo: chr  "yes" "yes" "no" "yes" ...
##  $ wheels     : int  1 1 1 1 2 0 0 2 1 1 ...
##  $ title      : chr  "~~ Wii MARIO KART &amp;amp; WHEEL ~ NINTENDO Wii ~ BRAND NEW ~~" "Mariokart Wii Nin
```

8. Display the number of observations (i.e. how many rows!)

```
nrow(mario.data)
```

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

9. Display the number of variables

```
ncol(mario.data)
```

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

10. What information does the variable `wheels` provide? You will need to read about the data on the website provided in order to answer this question.

Number of Wii wheels (attachments that simulate driving with a real wheel) included in the auction.

###Section 3

11. Ebay takes 10.2% of the total price of the games as a sales fee: https://www.ebay.com/help/selling/fees-credits-invoices/selling-fees?id=4364. Create a **new column in the data frame* that shows adjusted revenue for the seller after Ebay takes out its fee. Give your new column a name that makes sense.

```
mario.data$adjusted.price = mario.data$total_pr * ((100 - 10.2) / 100)
mario.data$adjusted.price
```

```
##   [1]  46.29190  33.26192  40.85900  39.51200  63.75800  40.41000  33.24396
##   [8]  48.48302  42.20600  44.90000  49.38102  50.29698  43.10400  50.28800
##  [15]  38.91034  41.30800  41.94558  41.30800  50.27902 293.20598  27.83800
##  [22]  48.47404  58.32510  45.34900  41.75700  49.39000  30.98100  32.32800
##  [29]  35.92000  42.20600  38.61400  27.83800  37.70702  44.44202  36.81800
##  [36]  40.21244  42.20600  39.51200  57.46302  48.27648  41.33494  37.94050
##  [43]  41.30800  46.68702  50.27902  37.70702  48.48302  35.02200  34.17788
##  [50]  41.30800  53.77224  26.02404  32.32800  46.68702  39.46710  28.73600
##  [57]  35.97388  43.10400  32.32800  27.83800  48.48302  26.94000  52.08400
##  [64]  34.21380 106.41300  55.46048  48.48302  35.92000  57.92100  44.01098
##  [71]  42.20600  36.00980  37.26700  50.28800  58.32510  44.00200  43.10400
##  [78]  34.12400  40.41000  37.67110  38.93728  49.38102  40.59858  58.38796
##  [85]  41.08350  57.47200  32.32800  49.12060  44.81918  42.20600  38.61400
##  [92]  32.31902  48.93202  41.30800  27.89188  49.92880  36.00980  47.22582
##  [99]  39.51200  34.35748  45.79800  43.99302  59.66312  57.02300  37.71600
## [106]  42.20600  49.39000  29.64298  48.27648  41.30800  38.61400  38.20990
## [113]  47.14500  51.63500  67.35000  43.93016  41.29902  35.96490  40.41000
## [120]  44.90000  44.67550  42.20600  50.28800  36.81800  41.30800  31.42102
## [127]  44.00200  54.77800  56.47522  41.30800  58.32510  33.21702  39.51200
## [134]  37.13230  33.22600  52.96404  35.02200  36.54860  35.47998  46.69600
## [141]  42.83460  34.80648  48.94998
```

12. Ebay also charges a $0.35 listing price per item. Create a new column in the data frame that shows total revenue for the seller after Ebay takes out **both* its sales fee and listing price. Give your column a new name that makes sense.

```
mario.data$legit.revenue = mario.data$adjusted.price - 0.35
mario.data$legit.revenue
```

```
##   [1]  45.94190  32.91192  40.50900  39.16200  63.40800  40.06000  32.89396
##   [8]  48.13302  41.85600  44.55000  49.03102  49.94698  42.75400  49.93800
##  [15]  38.56034  40.95800  41.59558  40.95800  49.92902 292.85598  27.48800
##  [22]  48.12404  57.97510  44.99900  41.40700  49.04000  30.63100  31.97800
##  [29]  35.57000  41.85600  38.26400  27.48800  37.35702  44.09202  36.46800
```

```
##  [36]  39.86244  41.85600  39.16200  57.11302  47.92648  40.98494  37.59050
##  [43]  40.95800  46.33702  49.92902  37.35702  48.13302  34.67200  33.82788
##  [50]  40.95800  53.42224  25.67404  31.97800  46.33702  39.11710  28.38600
##  [57]  35.62388  42.75400  31.97800  27.48800  48.13302  26.59000  51.73400
##  [64]  33.86380 106.06300  55.11048  48.13302  35.57000  57.57100  43.66098
##  [71]  41.85600  35.65980  36.91700  49.93800  57.97510  43.65200  42.75400
##  [78]  33.77400  40.06000  37.32110  38.58728  49.03102  40.24858  58.03796
##  [85]  40.73350  57.12200  31.97800  48.77060  44.46918  41.85600  38.26400
##  [92]  31.96902  48.58202  40.95800  27.54188  49.57880  35.65980  46.87582
##  [99]  39.16200  34.00748  45.44800  43.64302  59.31312  56.67300  37.36600
## [106]  41.85600  49.04000  29.29298  47.92648  40.95800  38.26400  37.85990
## [113]  46.79500  51.28500  67.00000  43.58016  40.94902  35.61490  40.06000
## [120]  44.55000  44.32550  41.85600  49.93800  36.46800  40.95800  31.07102
## [127]  43.65200  54.42800  56.12522  40.95800  57.97510  32.86702  39.16200
## [134]  36.78230  32.87600  52.61404  34.67200  36.19860  35.12998  46.34600
## [141]  42.48460  34.45648  48.59998
```