David Aarhus

Problem Set 1

Question 1a

> x

[1] -1.00 -0.98 -0.96 -0.94 -0.92 -0.90 -0.88 -0.86 -0.84 -0.82 -0.80 -0.78

[13] -0.76 -0.74 -0.72 -0.70 -0.68 -0.66 -0.64 -0.62 -0.60 -0.58 -0.56 -0.54

[25] -0.52 -0.50 -0.48 -0.46 -0.44 -0.42 -0.40 -0.38 -0.36 -0.34 -0.32 -0.30

[37] -0.28 -0.26 -0.24 -0.22 -0.20 -0.18 -0.16 -0.14 -0.12 -0.10 -0.08 -0.06

[49] -0.04 -0.02 0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18

[61] 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34 0.36 0.38 0.40 0.42

[73] 0.44 0.46 0.48 0.50 0.52 0.54 0.56 0.58 0.60 0.62 0.64 0.66

[85] 0.68 0.70 0.72 0.74 0.76 0.78 0.80 0.82 0.84 0.86 0.88 0.90

[97] 0.92 0.94 0.96 0.98 1.00

Question 1b

> y

[1] 0.6065307 0.6126264 0.6187834 0.6250023 0.6312836 0.6376282 0.6440364

[8] 0.6505091 0.6570468 0.6636503 0.6703200 0.6770569 0.6838614 0.6907343

[15] 0.6976763 0.7046881 0.7117703 0.7189237 0.7261490 0.7334470 0.7408182

[22] 0.7482636 0.7557837 0.7633795 0.7710516 0.7788008 0.7866279 0.7945336

[29] 0.8025188 0.8105842 0.8187308 0.8269591 0.8352702 0.8436648 0.8521438

[36] 0.8607080 0.8693582 0.8780954 0.8869204 0.8958341 0.9048374 0.9139312

[43] 0.9231163 0.9323938 0.9417645 0.9512294 0.9607894 0.9704455 0.9801987

[50] 0.9900498 1.0000000 1.0100502 1.0202013 1.0304545 1.0408108 1.0512711

[57] 1.0618365 1.0725082 1.0832871 1.0941743 1.1051709 1.1162781 1.1274969

[64] 1.1388284 1.1502738 1.1618342 1.1735109 1.1853049 1.1972174 1.2092496

[71] 1.2214028 1.2336781 1.2460767 1.2586000 1.2712492 1.2840254 1.2969301

[78] 1.3099645 1.3231298 1.3364275 1.3498588 1.3634251 1.3771278 1.3909681

[85] 1.4049476 1.4190675 1.4333294 1.4477346 1.4622846 1.4769808 1.4918247

[92] 1.5068178 1.5219616 1.5372575 1.5527072 1.5683122 1.5840740 1.5999942

[99] 1.6160744 1.6323162 1.6487213

Question 1c

[1] 50

Question 1d

[1] 46

Question 1e

> which(y > ave)

[1] 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73

[19] 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91

[37] 92 93 94 95 96 97 98 99 100 101

Question 2a

> getwd()

[1] "/Users/DavidAarhus"

> setwd("/Users/DavidAarhus/Documents/310 R")

> getwd()

[1] "/Users/DavidAarhus/Documents/310 R"

Question 2b

> id <- c(1:150)

> id

[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 99 100 101 102 103 104 105 106 107 108

[109] 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126

[127] 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144

[145] 145 146 147 148 149 150

Question 2c

> set.seed(310) #produces the same random numbers when ran with 'rnorm'

> netflix <- rnorm(150, mean = 20, sd = 5)

> netflix

[1] 14.251342 24.625807 21.178723 23.711147 29.356239 16.158277

[7] 17.972604 24.656900 25.958671 16.362449 8.343664 18.581802

[13] 21.830583 18.277007 15.464054 16.086442 23.580804 16.393538

[19] 19.264632 20.534280 28.096414 25.951035 20.686829 23.294869

[25] 30.297597 15.657571 23.284291 19.947930 24.428594 22.029029

[31] 16.932434 31.540913 18.540866 10.552418 15.323736 9.908149

[37] 18.420192 19.222306 16.789106 13.237632 21.908002 22.172176

[43] 16.122534 12.796389 18.799270 8.916388 19.147639 11.010703

[49] 17.898237 22.616867 15.270066 28.515311 16.054396 15.854387

[55] 22.083111 21.209326 22.694032 20.141551 20.389134 24.533152

[61] 11.381356 15.496304 11.702680 16.685362 19.474550 12.711801

[67] 22.181142 20.457381 21.376997 21.465372 26.492906 21.196862

[73] 16.924580 22.981303 20.413162 23.398849 18.913897 15.689776

[79] 15.967571 17.182671 16.149114 21.910020 14.529170 24.957211

[85] 21.331372 13.301189 22.273804 16.254683 19.470084 27.053348

[91] 19.067785 21.304521 19.007460 21.747332 31.308864 27.003989

[97] 16.966371 26.051594 17.542674 25.487161 23.171921 16.912898

[103] 21.944585 23.145513 16.890341 24.969738 30.163716 25.501778

[109] 11.086189 12.321719 24.637322 16.449346 18.951530 17.218945

[115] 14.808221 11.613344 15.085046 20.737377 21.113092 22.683871

[121] 26.006313 21.998345 8.395618 21.572450 29.710224 16.773882

[127] 17.912909 30.105328 21.375843 21.978872 21.538766 17.409560

[133] 19.235269 7.203502 25.767568 17.954738 13.015577 21.974851

[139] 11.602865 26.302511 23.959555 17.060980 14.106499 22.809690

[145] 22.734735 20.277317 19.479127 24.969499 17.680977 22.659607

Question 2d

> set.seed(310) #produces the same random results when ran with code

> hulu <- runif(n=150, min=0, max=15) #creates vector of random

> hulu

[1] 1.87690830 12.64914866 12.33838514 13.31796228 8.89776908

[6] 13.85297957 11.56538699 5.15516312 14.54016955 9.06694199

[11] 3.31711889 4.42517980 5.13843936 4.18335749 12.36257228

[16] 5.92128569 13.24975900 9.66556586 3.50185110 12.39363287

[21] 0.14804444 14.97008964 5.82514968 3.30187604 9.64291434

[26] 4.29995535 5.47797060 6.59460051 2.73230086 11.95993820

[31] 3.25347382 2.05493720 11.44580929 0.02290454 3.53047217

[36] 7.11376005 6.62305472 5.73562014 8.13822608 4.46068117

[41] 14.20960177 13.09642869 13.24526214 5.31594531 8.31943708

[46] 14.55858117 11.17565527 14.12136946 14.70416631 6.45401584

[51] 2.88846362 0.46558987 11.16545906 2.17476579 7.43768178

[56] 5.19175284 12.18173201 5.49964944 9.86336018 10.55002879

[61] 4.04652821 5.44997684 14.84258271 2.45853208 5.77814279

[66] 8.24992904 0.44116994 11.24462922 2.62243522 7.34731244

[71] 0.32664550 0.36436700 5.64023770 3.00983854 6.57297381

[76] 9.41687057 3.90567777 3.37534889 1.32167897 6.96338161

[81] 9.72931672 2.02804832 10.02020657 7.86912749 3.28536189

[86] 9.07223358 1.12247387 1.52930769 6.07662797 7.74013285

[91] 0.19981542 7.57006522 6.48479116 2.14686098 0.54149467

[96] 5.54270844 5.05670975 5.71703064 10.49464211 9.77820997

[101] 2.58116495 13.27725644 14.33582678 3.01578446 3.22531060

[106] 0.91493949 3.05276305 6.23055800 9.92283907 8.23937015

[111] 8.93336517 6.04758647 10.57484684 5.66343360 7.66938910

[116] 10.40951176 7.96525629 12.54860367 12.26548293 11.83424774

[121] 0.63567600 6.08433102 2.75795228 4.78900018 0.72766766

[126] 5.88803077 3.80532654 5.92601543 6.87228280 5.68457036

[131] 1.08704889 5.90597891 10.02996742 12.66610993 8.04664357

[136] 4.72849819 9.12742925 12.51075323 9.22901038 2.50603069

[141] 13.54434228 1.04406511 8.91887413 1.60362984 4.03874482

[146] 11.00494726 10.86749121 3.99986589 7.99392147 14.34909513

Question 2e

![A screenshot of a cell phone

Description automatically generated]()

![A screenshot of a cell phone

Description automatically generated]()

Question 2f

> values <- c("Yes", "No") #creates values vector

> subscription <- factor(values) #creates a factor variable

> is.factor(subscription) #varifies if 'subscription' is a factor variable

[1] TRUE

>

Question 2g

> set.seed(310) #produces the same random results when ran with code

> amazon <- sample(subscription, size = 150, replace = TRUE) #vector named amazon of size 150

> #with samples from the vector subscription

> amazon[1:20] #print first 20 observations of amazon

[1] Yes Yes No No Yes Yes No No Yes Yes Yes No Yes No Yes Yes No No No

[20] Yes

Levels: No Yes

Question 2h

> sum(amazon == "Yes") #counts to see how many amazon subscriptions are amongst the sample

[1] 69

>

Question 2i

> sum(netflix > 20 & amazon == "No") #checks to see which people watch 20+ hours of Netflix and don’t have an amazon subscription

[1] 38

>

Question 2j

> sum(hulu < 12 & netflix < 12 & amazon == "Yes") #checks to see which hulu and netflix customers watch less than 12 hours and have an amazon subscription

[1] 4

>

Question 2k

> id[amazon == "Yes"] #grabs id of the users who are subscribed to amazon

[1] 1 2 5 6 9 10 11 13 15 16 20 21 23 24 25 26 28 31 32

[20] 34 35 36 37 39 41 45 50 52 53 57 58 63 66 68 70 73 74 76

[39] 77 79 81 82 83 84 87 92 93 96 98 103 104 110 111 112 113 115 117

[58] 119 120 122 130 135 137 138 139 141 144 147 150

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