HW_1 IS457 COURSE_ID : 8 PART 1. Cat Data

Load data for this assignment into your R session with the following command:

install.packages("MASS")

```
library(MASS)
data(cats)
```

Check to see that the data were loaded by running:

```
objects(cats)
```

```
## [1] "Bwt" "Hwt" "Sex"
```

```
class(cats)
```

```
## [1] "data.frame"
```

(1). Find the average body weight and average heart weight. (2 pts)

```
mean(cats$Bwt)
```

```
## [1] 2.723611
```

```
mean(cats$Hwt)
```

```
## [1] 10.63056
```

(2). Find how many observations in the dataset. (1 pt)

```
dim(cats)
```

```
## [1] 144   3
```

144 observations

(3). Find the number of male cats and the number of female cats. (1 pt)

```
dim(cats[cats$Sex=="M",])
```

```
## [1] 97  3
```

```r
dim(cats[cats$Sex=="F",])
```

```
## [1] 47  3
```

97 male cats, 47 female cats

(4). Find the average body weight of male cats.(1 pt)

```r
mean(cats[cats$Sex=="M",c("Bwt")])
```

```
## [1] 2.9
```

!(5). Show the summary or the structure of this dataset and list the categorical variable in the dataset. (2 pts)

categorical variable would be sex which is either male or female

```r
summary(cats)
```

```
##  Sex         Bwt             Hwt
##  F:47   Min.   :2.000   Min.   : 6.30
##  M:97   1st Qu.:2.300   1st Qu.: 8.95
##         Median :2.700   Median :10.10
##         Mean   :2.724   Mean   :10.63
##         3rd Qu.:3.025   3rd Qu.:12.12
##         Max.   :3.900   Max.   :20.50
```

(6). What is the highest heart weight of male cats? (1 pt)

```r
cats[cats$Sex=="M"& cats$Hwt==max(cats$Hwt),]
```

```
##     Sex Bwt  Hwt
## 144   M 3.9 20.5
```

20.5

(7). (3 pts)

Try running each expression in R.

Record the error message in a comment

Explain what it means.

Be sure to directly relate the wording of the error message with

the problem you find in the expression.

mean(Bwt,Hwt)

Error in mean(Bwt, Hwt) : object 'Bwt' not found

the mean function is used to obtain the average of a set of values. Bwt and Hwt are not recognised as objects on their own, they can only be accessed through cats dataset using the $ sign, they are objects of that dataset

mean(cats$Bwt, cats$**Hwt)**

Error in mean.default(cats$Bwt, cats$**Hwt) : 'trim' must be numeric of length one**

this means the mean function can only find the average of one numeric set of values per time

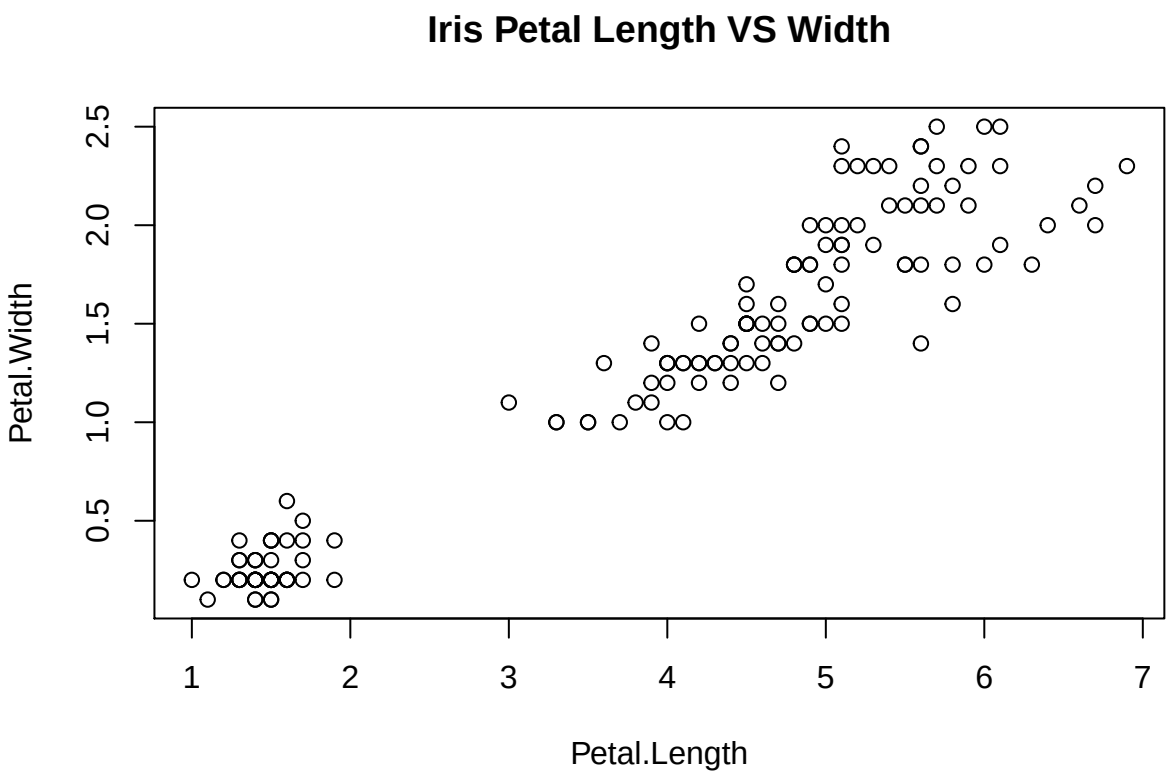
rowMeans(cats$Bwt, cats$**Hwt)**

Error in rowMeans(cats$Bwt, cats$**Hwt) : 'x' must be an array of at least two dimensions**

this means the rowMeans function expects x to be a 2 or more dimensional array, cats$Bwt only has one dimension

PART2 iris data

```
View(iris)
plot(iris$Petal.Length , iris$Petal.Width, xlab = "Petal.Length", ylab = "Petal.Width", main = "Iris Pe
```



(2) I observe that as petal length increases ,petal width also increases which means they are positively correlated

(3) I think it would be interesting to be able to find out the correlation value

PART3

(1). Use you UIN number to set the seed in set.seed() function. (1 pt)

```
set.seed(650754765)
```

(2). Generate a vector called "unifsample" containing 1000 random samples from a uniform distribution [0,2] (1 pt)

```
runif(1000,0,2)
```

```
##    [1] 1.487682092 0.299860043 0.101399670 0.036107820 1.208633177
##    [6] 1.846684460 0.917023854 0.252831535 1.379360063 0.122062581
##   [11] 1.556442631 0.055719699 0.399379994 0.784303313 1.266040941
##   [16] 0.646444265 0.335497621 0.175706134 1.164900336 1.282640086
##   [21] 1.266883939 1.778205493 0.691399078 1.275345269 1.178707825
##   [26] 1.151172636 0.353052560 0.374277337 0.059556993 0.833407288
##   [31] 1.640167880 0.483785361 0.988134242 1.146798770 1.334463301
##   [36] 1.828267122 1.952779644 0.310749010 1.093420412 0.183270960
##   [41] 0.281370133 0.039352459 1.132874533 0.743937107 1.630967804
##   [46] 1.626931327 1.605549295 0.614024813 0.597578718 0.504564008
##   [51] 0.637076758 0.779752876 0.206835958 1.353259486 1.935313010
##   [56] 1.313205075 0.510613333 0.686942996 1.310024523 1.012572779
##   [61] 0.535905873 0.903699592 1.225208951 1.859184133 0.776526508
##   [66] 1.898053048 0.294647717 0.575568412 1.285753128 1.442645855
##   [71] 1.811179787 0.258280901 0.673805057 1.275328786 1.216219009
##   [76] 0.734445717 0.530248456 1.474527473 1.367077750 0.364095376
##   [81] 1.195648764 0.645603235 0.560686938 1.792891262 1.493869659
##   [86] 0.253033470 0.703975111 1.749024654 1.071715746 0.108651905
##   [91] 0.040517568 0.731100436 0.516626410 0.415006424 1.341693936
##   [96] 1.597749248 1.277060119 0.742598951 1.717862973 0.583834413
##  [101] 0.933897004 0.636877816 0.440948429 0.152054815 0.211359460
##  [106] 0.735968924 0.628853428 1.518861022 1.901710900 0.989556776
##  [111] 1.196696553 0.043223547 0.509555196 0.210248636 1.855011794
##  [116] 1.961142073 0.176772704 0.515969949 1.529902482 1.416714373
##  [121] 1.793011323 0.015518392 1.282834699 1.268724883 1.749008139
##  [126] 0.969672471 0.577577972 1.916124879 0.276168377 1.312688527
##  [131] 1.940302620 0.971908844 1.466749330 1.572472997 0.932389426
##  [136] 1.163051918 1.723967442 1.275009124 0.648345139 1.755395712
##  [141] 0.222716426 0.305708016 1.763051627 1.883485459 0.663473549
##  [146] 1.751522674 0.719593424 0.974056663 1.666544680 0.511883632
##  [151] 0.016920526 0.595729692 0.924834741 1.767036146 0.932549092
##  [156] 1.725836120 1.732091627 1.678212120 0.653036439 0.461407027
##  [161] 1.198466062 1.482921026 0.919041481 0.381385344 0.604788829
##  [166] 1.984479191 0.480807375 0.370783353 0.465184191 0.101126533
##  [171] 0.427247799 1.683011981 1.792762058 0.240744622 1.746611234
##  [176] 1.367230387 1.546401014 0.828387566 1.598692849 0.281147334
##  [181] 0.074254623 0.826684269 0.536645188 1.357562348 1.623867683
##  [186] 0.586307462 0.028434502 1.015860057 1.372153272 0.235502827
##  [191] 1.987876482 0.267814796 1.404514946 0.482751654 1.050511784
##  [196] 0.221653192 1.603547653 0.745998592 1.908572358 1.124994879
##  [201] 0.561172388 0.403592005 0.168291480 1.704914265 0.496553365
##  [206] 1.854142477 0.008414723 0.171324601 1.954747499 0.531692978
##  [211] 1.268515866 0.949348908 0.247954993 0.151829875 0.912821513
##  [216] 1.285795743 0.410817637 1.443339032 1.113833941 0.057590812
##  [221] 1.824887278 1.455376250 0.255100462 0.158808766 0.010868237
##  [226] 0.813658777 1.594101224 0.318024779 1.116826425 1.002518761
```

```
##  [231] 0.327231743 1.502528807 0.350566507 1.138966394 0.062148550
##  [236] 0.141990384 0.611900971 0.064823187 0.344007884 1.513216973
##  [241] 1.557570660 1.152368652 0.925306363 1.252468920 1.130855259
##  [246] 0.766843833 0.787345349 1.722686971 1.930839500 0.575370609
##  [251] 1.491355570 0.691151233 0.191995147 0.576670666 0.269147838
##  [256] 0.634382529 1.150587685 1.642039988 1.022605846 0.124271402
##  [261] 1.256068900 0.800200383 1.584759886 1.114778530 1.636359616
##  [266] 1.691390096 1.680593115 1.999764589 0.653382992 1.978060162
##  [271] 1.685441373 0.416305914 1.493932249 1.390174707 1.059731252
##  [276] 0.760425140 0.124170965 1.966443589 1.913572466 0.667238656
##  [281] 0.312317041 0.538865117 1.879579920 1.387518812 1.499181878
##  [286] 0.856475972 1.978495846 0.490417697 0.569253369 1.061055469
##  [291] 0.596966140 1.099469922 0.948794809 1.028636429 1.765436924
##  [296] 0.988491378 1.056446963 0.254871862 1.671325323 1.302258892
##  [301] 0.364355841 0.721831416 0.198351554 1.659662278 0.615393391
##  [306] 0.688451190 1.173545118 0.142619059 1.206563886 0.018591837
##  [311] 0.967745950 0.803149430 0.862720293 1.952737992 0.002112504
##  [316] 0.096310636 0.910725166 0.240247898 1.756572584 1.514040675
##  [321] 0.401794041 1.613345960 1.471479050 0.894737731 0.552846094
##  [326] 0.560721439 1.750433543 1.480680365 0.663995957 0.471107147
##  [331] 0.811786248 1.892035088 1.366333646 0.900134224 0.690136040
##  [336] 1.510276960 0.006340407 1.391159527 1.968019212 0.312824152
##  [341] 0.560723098 0.947050036 1.550604094 1.672911876 1.911195816
##  [346] 1.925077945 0.814412267 0.866313331 1.223984085 0.929400886
##  [351] 0.226105919 0.081211124 1.862308915 1.257555114 1.275115252
##  [356] 1.591906944 1.554646443 0.524468187 1.414758368 1.625632521
##  [361] 1.401818055 1.013915682 1.890964702 0.208696215 1.137239180
##  [366] 1.473481555 0.416250776 1.395837351 1.275686077 0.451417140
##  [371] 1.269848918 0.133655715 1.394113245 0.155213054 0.764692227
##  [376] 1.887971523 1.572822521 0.560244743 0.479936739 0.663164278
##  [381] 0.321412797 0.403937961 1.961885879 1.386216124 1.165767556
##  [386] 1.386416853 0.181101284 1.069218365 0.950889835 0.902682336
##  [391] 0.257444346 0.519974587 1.704719507 1.087707582 0.822762355
##  [396] 0.091567263 1.340573558 1.039394360 1.802971833 0.305367568
##  [401] 0.023530643 1.756419742 1.236076884 0.859005346 0.879716202
##  [406] 0.536522144 1.381833636 1.459044225 0.358337292 0.701847020
##  [411] 0.612111856 0.242865404 0.432059984 1.684624408 0.938465613
##  [416] 1.086253733 0.443912905 0.071277467 0.611031499 0.768885277
##  [421] 0.675378677 1.437943725 0.256472862 1.621282879 0.801358415
##  [426] 0.294987945 1.619625161 1.767534053 0.750898197 1.358692138
##  [431] 1.540611398 1.053585424 1.911803414 0.185194177 0.452971425
##  [436] 1.631457302 0.565139668 0.326369497 1.340063800 0.366301340
##  [441] 1.362702550 0.273754462 0.132040880 1.110788412 0.875048656
##  [446] 0.982961106 1.723440817 0.637806682 1.914892902 0.637472279
##  [451] 1.682497279 1.984675676 1.163848425 1.062599456 1.051259540
##  [456] 1.657335539 0.464539640 0.400855906 1.420047922 1.803736049
##  [461] 0.633300938 1.930199823 0.923900802 1.415204410 0.961952365
##  [466] 0.231828094 1.543348233 1.821531040 1.985083336 1.633298649
##  [471] 0.417281899 1.613357339 0.211379962 1.771437897 0.764871885
##  [476] 1.292818838 0.474380270 0.282332478 1.192884685 1.964084895
##  [481] 0.828527509 1.840209993 0.641063493 1.229236825 0.992802385
##  [486] 0.807624684 1.527742668 0.783755451 1.390888473 1.632210576
##  [491] 0.929441796 0.967156886 1.207601338 0.658851439 1.424147989
##  [496] 0.676970960 1.338483301 0.105301581 0.588419051 1.476814817
```

```
##  [501] 1.261771982 0.696492922 0.897678117 1.248605632 1.336857335
##  [506] 1.039869059 0.621870137 0.492147852 1.903903019 0.087487195
##  [511] 1.803645428 1.027912262 0.864425405 0.590781026 0.607348077
##  [516] 1.243296223 0.912663153 0.961566366 0.481180366 0.246131501
##  [521] 0.166427467 0.800999763 0.522492871 0.129235536 1.664308372
##  [526] 1.225663521 1.323640275 0.143722728 1.162758666 0.137700416
##  [531] 0.828113549 0.210328619 0.933843767 1.602357667 0.684875301
##  [536] 1.524346663 0.157785957 0.490440575 0.341924781 1.748198627
##  [541] 0.987931357 0.738237051 0.330021768 0.162559097 0.460109110
##  [546] 0.356421764 1.260430953 0.051841872 1.858734711 0.449829535
##  [551] 1.247446729 1.516647967 0.607181036 0.888956066 0.700083982
##  [556] 0.989257167 1.074247325 0.754198145 0.363658253 0.562490900
##  [561] 0.526661925 1.649290925 1.362268222 0.240967476 1.459498505
##  [566] 1.988630202 0.222411211 1.494768840 0.784283440 0.323779752
##  [571] 0.531237936 1.400115703 0.600480206 0.031474560 1.696377566
##  [576] 0.374648420 1.959720223 0.082650729 1.404677722 1.055023270
##  [581] 0.198915356 0.912977776 0.267919338 1.560574663 1.503772804
##  [586] 0.688282645 1.143520417 1.996815644 1.497932487 1.059204220
##  [591] 0.695112918 1.048405474 1.106571435 1.469831235 1.286159310
##  [596] 0.912158865 0.344378375 1.302707028 0.045307445 0.469601172
##  [601] 1.759643991 0.167307942 0.279803783 1.708337718 0.891327479
##  [606] 0.946461631 0.955087926 1.862280911 1.716028835 1.531102057
##  [611] 0.212596701 0.157838587 1.985431537 0.384908987 1.771078174
##  [616] 1.554996857 1.695160450 1.762094510 0.580467157 0.645309972
##  [621] 1.180721513 0.992302250 0.758970911 0.110693221 1.655746852
##  [626] 0.219265677 1.051225041 1.607958203 0.722470683 1.872877053
##  [631] 1.334735817 1.676245025 0.821985422 1.010198235 1.016976838
##  [636] 0.565043449 0.501945762 1.330481973 1.224430331 1.710592410
##  [641] 1.447019618 0.056986207 0.321197383 1.095897934 0.010357705
##  [646] 0.738337688 0.627440960 1.862999093 0.883265720 1.947492752
##  [651] 1.712191015 1.344564217 0.737554377 1.210053645 0.498591582
##  [656] 1.181252782 1.841555425 0.786694691 1.787986698 1.910931310
##  [661] 0.276518590 1.175297289 0.821146669 1.751961119 1.882117992
##  [666] 0.326939427 1.923038653 1.666060250 1.580825310 1.856683773
##  [671] 1.752085744 0.434354726 0.656463011 1.638003026 1.678455622
##  [676] 0.443799106 1.909231296 1.067604685 1.395975637 0.269126831
##  [681] 0.079021393 1.473593208 1.062754615 0.613921310 0.033407197
##  [686] 0.439145499 0.416023255 0.166667651 1.993820435 1.588096323
##  [691] 1.355745369 0.751288017 1.267182045 0.401954377 0.540655421
##  [696] 0.228059982 0.205551237 0.989988269 1.761668579 1.598057006
##  [701] 1.258097242 1.364330118 1.286844746 0.664611849 1.766363541
##  [706] 0.571514148 0.731800721 0.286011134 0.222671456 0.662133281
##  [711] 0.629298813 0.376412992 1.408219338 0.246272805 0.879548549
##  [716] 1.754249542 1.057145587 1.402332578 1.901034775 1.320678935
##  [721] 1.149123704 1.276406561 1.768168827 1.393566309 1.681270029
##  [726] 0.331461459 0.454627444 0.351100315 1.317413516 1.517216339
##  [731] 1.540193274 0.178314726 0.202675581 1.713067438 1.823777590
##  [736] 1.989114058 1.099333174 0.937840439 0.785367091 1.816219867
##  [741] 1.280265597 1.980937644 0.744905957 0.278056602 1.869063760
##  [746] 0.384724663 1.405075392 0.606999971 0.514117121 1.722850396
##  [751] 0.631112013 1.252394805 0.208069021 0.240076312 1.163611851
##  [756] 0.243616068 0.446257751 0.174069199 0.781344441 0.913289132
##  [761] 1.692139808 1.035552697 1.485249435 0.536840777 1.262415182
##  [766] 0.106383255 1.505942645 1.285894997 0.761962594 1.623620728
```

```
##  [771] 0.264508021 0.076626760 0.503974807 1.707538939 0.223447805
##  [776] 1.657133093 1.637132547 0.019435272 1.596706524 1.559309222
##  [781] 0.928233609 0.435120489 0.426373468 0.049740922 0.013014222
##  [786] 1.796005452 0.027438997 1.282867159 0.407373462 0.564151911
##  [791] 0.409689983 1.892754391 1.805793545 1.945788455 1.653256226
##  [796] 1.680061694 1.965587541 0.211262762 1.890515771 1.553172152
##  [801] 0.624053094 1.493623788 1.790407308 0.692519120 1.520257860
##  [806] 1.802320272 1.850498985 0.653095967 1.223749388 0.102832116
##  [811] 0.315743725 1.834936374 1.703042988 1.215691535 1.649844187
##  [816] 1.447005960 0.055292202 0.601957468 1.507249464 0.903691504
##  [821] 1.308342351 0.598595402 0.771342849 1.765852221 0.772822201
##  [826] 0.575498871 0.818722627 0.568001324 0.275225341 0.209172584
##  [831] 1.838390204 0.404645224 0.979767589 0.804418144 0.419778425
##  [836] 1.849407680 0.719853283 0.960173980 1.987066087 0.425896393
##  [841] 1.807241728 0.132871039 0.980254383 0.090277243 1.532143751
##  [846] 0.858531466 0.875312144 0.632823193 0.482905348 1.802989562
##  [851] 0.472594628 0.687490325 1.734363207 0.247310201 1.509969079
##  [856] 1.121684310 1.330521511 1.253468716 1.389713156 0.131671188
##  [861] 0.636634423 1.034248529 1.363793942 1.867304415 0.482311877
##  [866] 0.679488137 0.162199205 1.529522783 0.920610219 0.590027653
##  [871] 1.954464167 0.889911968 0.876346715 1.042045230 1.020026065
##  [876] 1.363689878 0.187270436 0.793728742 1.203829369 1.868602717
##  [881] 1.009713548 1.121366958 1.919867798 0.055244317 1.004614628
##  [886] 0.474928454 1.577293206 1.498675184 1.395189608 0.262784766
##  [891] 0.621746372 1.975901765 1.705678470 1.433778083 1.639118352
##  [896] 1.335379047 1.948346139 0.007066059 0.150605373 1.225147077
##  [901] 0.369141096 1.766306554 0.713356758 0.345690232 1.216607804
##  [906] 0.808321933 0.237453013 0.232598988 1.549318802 1.017691061
##  [911] 1.620781719 0.589425099 1.694208473 0.282120243 0.254229329
##  [916] 0.355401745 0.407007996 0.173943233 0.785222384 0.895599281
##  [921] 0.357873543 0.201919775 1.549472113 1.967784266 1.803342188
##  [926] 1.712736357 0.518540033 0.628869848 0.355179925 1.758642936
##  [931] 1.799773445 0.542298167 0.900500527 0.038859127 0.011838411
##  [936] 0.536586212 1.701599353 0.137093720 1.208797239 1.818197590
##  [941] 0.052912141 0.651322423 1.807506282 1.191873303 0.921172330
##  [946] 1.174495605 0.644546371 1.943168423 0.873348887 1.585033826
##  [951] 1.416566976 0.296912373 1.315147467 1.888555881 1.165919458
##  [956] 1.981967377 1.032674690 1.911318145 1.219671696 1.456754252
##  [961] 0.777170158 1.795803072 1.581611780 1.188001811 1.261908536
##  [966] 1.729705234 1.711157158 0.275325993 1.434582028 0.624239994
##  [971] 0.448686309 1.224027857 1.740171466 1.896911652 1.622700837
##  [976] 0.957933141 0.074085451 1.089905881 1.362728900 1.339029111
##  [981] 1.378509882 0.131299815 0.611202244 1.400351033 0.440378651
##  [986] 1.491112811 0.463252503 1.751308889 0.164071351 0.525301534
##  [991] 1.214825645 0.430880775 0.753312453 1.063463273 1.536795566
##  [996] 0.181479082 1.793385448 0.969807111 1.672456933 0.574262139
```

```r
unifsample= runif(1000,0,2)
View(unifsample)
```

(3). Calculate the mean of the 1000 values in "unifsample". (1 pt)

```
mean(unifsample)
```

```
## [1] 0.9999234
```

(4). Use logical operations (>,<,==,....) to calculate

the fraction of the values in "unifsample" that are more than 1. (1 pt)

```
unifsample[(unifsample>1)=="TRUE"]
```

```
##   [1] 1.348437 1.386562 1.842123 1.866263 1.622691 1.176842 1.123612
##   [8] 1.416407 1.902664 1.183026 1.363365 1.650880 1.975183 1.236211
##  [15] 1.457070 1.209948 1.778326 1.496745 1.043511 1.249225 1.115835
##  [22] 1.497262 1.121421 1.349547 1.706335 1.519485 1.464566 1.918865
##  [29] 1.559650 1.905664 1.592716 1.593918 1.405189 1.829222 1.973433
##  [36] 1.932403 1.857481 1.755526 1.113335 1.721491 1.792818 1.908817
##  [43] 1.265055 1.746613 1.346653 1.119568 1.460634 1.010881 1.112235
##  [50] 1.165096 1.135743 1.951510 1.240130 1.422950 1.841830 1.581185
##  [57] 1.349939 1.632256 1.439828 1.726195 1.043565 1.085938 1.234451
##  [64] 1.221039 1.209727 1.986389 1.733590 1.113248 1.067970 1.864126
##  [71] 1.842230 1.956356 1.494628 1.444626 1.953028 1.199293 1.159701
##  [78] 1.366580 1.875228 1.300827 1.290411 1.206301 1.110713 1.297085
##  [85] 1.889292 1.862228 1.255885 1.397846 1.626458 1.058067 1.522067
##  [92] 1.685023 1.917347 1.384402 1.635730 1.398062 1.888435 1.038994
##  [99] 1.229655 1.763303 1.124364 1.497414 1.344693 1.946617 1.049259
## [106] 1.473769 1.598462 1.991862 1.830593 1.554215 1.791569 1.440377
## [113] 1.788948 1.084904 1.700416 1.604888 1.444265 1.236675 1.791645
## [120] 1.920866 1.987523 1.318596 1.647486 1.654580 1.630988 1.550020
## [127] 1.453399 1.993723 1.823240 1.774245 1.633810 1.133094 1.882038
## [134] 1.068370 1.371258 1.040669 1.530728 1.324563 1.677440 1.023002
## [141] 1.477775 1.539861 1.935518 1.228559 1.849826 1.514663 1.338985
## [148] 1.258169 1.183038 1.731642 1.526040 1.504928 1.319486 1.085602
## [155] 1.547807 1.212652 1.929563 1.702575 1.076829 1.023481 1.262415
## [162] 1.363372 1.298155 1.723853 1.563015 1.383129 1.729231 1.126995
## [169] 1.811011 1.084271 1.625895 1.421057 1.865870 1.521219 1.724843
## [176] 1.871122 1.094263 1.019046 1.472031 1.036262 1.300034 1.227880
## [183] 1.015272 1.453850 1.482327 1.592867 1.866601 1.511705 1.700635
## [190] 1.782013 1.953630 1.474401 1.030655 1.674805 1.403062 1.070923
## [197] 1.261876 1.214022 1.356986 1.900045 1.990660 1.116741 1.098033
## [204] 1.648187 1.786337 1.965515 1.314831 1.987501 1.856693 1.961320
## [211] 1.700495 1.217517 1.763998 1.193493 1.069297 1.990515 1.080420
## [218] 1.837364 1.143593 1.627800 1.866256 1.949089 1.714324 1.655522
## [225] 1.058402 1.912182 1.153930 1.849845 1.052177 1.331612 1.831191
## [232] 1.830891 1.654347 1.937937 1.339254 1.102866 1.848978 1.664234
## [239] 1.483995 1.476931 1.740232 1.335578 1.573992 1.170855 1.812033
## [246] 1.618052 1.681540 1.997084 1.055065 1.415736 1.577935 1.973762
## [253] 1.846298 1.448106 1.067490 1.082235 1.809663 1.022988 1.940456
```

```
## [260] 1.998409 1.517270 1.228816 1.549970 1.291417 1.747208 1.301441
## [267] 1.204401 1.840602 1.972543 1.055848 1.141576 1.794128 1.947162
## [274] 1.682171 1.599981 1.849649 1.985130 1.717422 1.909825 1.484372
## [281] 1.963939 1.809742 1.548811 1.899175 1.389585 1.378749 1.912716
## [288] 1.608988 1.548550 1.279330 1.301397 1.555726 1.595214 1.385024
## [295] 1.147057 1.717254 1.835619 1.111865 1.412432 1.304189 1.926977
## [302] 1.843877 1.595946 1.285836 1.483160 1.825998 1.600395 1.531438
## [309] 1.628437 1.361673 1.498290 1.838485 1.200533 1.270622 1.084589
## [316] 1.482369 1.483296 1.140487 1.001752 1.320728 1.169553 1.477570
## [323] 1.902603 1.414320 1.188914 1.267540 1.339403 1.202788 1.399237
## [330] 1.017286 1.030620 1.990732 1.857049 1.101858 1.230934 1.743569
## [337] 1.237710 1.628118 1.210162 1.004421 1.749374 1.046375 1.105520
## [344] 1.048134 1.942228 1.808534 1.245565 1.867206 1.521140 1.911982
## [351] 1.006514 1.275264 1.812126 1.011418 1.894329 1.713333 1.861875
## [358] 1.493564 1.568009 1.635727 1.368120 1.702819 1.491264 1.635531
## [365] 1.823046 1.877677 1.875962 1.623279 1.801546 1.197171 1.460444
## [372] 1.213698 1.455412 1.946865 1.131108 1.127566 1.930058 1.483208
## [379] 1.577845 1.695368 1.427790 1.414698 1.412058 1.618039 1.019070
## [386] 1.259940 1.217760 1.004980 1.232649 1.605922 1.233472 1.809910
## [393] 1.791355 1.562740 1.357937 1.846513 1.533148 1.468757 1.340533
## [400] 1.996629 1.408945 1.553804 1.744314 1.431151 1.621815 1.242345
## [407] 1.427369 1.701524 1.567405 1.576861 1.376937 1.234191 1.468737
## [414] 1.198770 1.403393 1.514519 1.679658 1.580240 1.948102 1.828319
## [421] 1.470577 1.638514 1.026705 1.132313 1.498068 1.968515 1.153378
## [428] 1.880388 1.331192 1.415604 1.095879 1.399818 1.697918 1.535435
## [435] 1.323018 1.015357 1.087704 1.783236 1.275541 1.968190 1.307976
## [442] 1.919587 1.557441 1.721056 1.310499 1.484123 1.546665 1.773714
## [449] 1.416871 1.412923 1.209858 1.107961 1.463314 1.895313 1.994667
## [456] 1.890053 1.433182 1.570926 1.564983 1.529361 1.489826 1.246763
## [463] 1.738268 1.146958 1.846587 1.956452 1.772951 1.131968 1.016801
## [470] 1.174606 1.341644 1.369451 1.352534 1.140945 1.604627 1.573771
## [477] 1.220156 1.955542 1.126738 1.037200 1.774475 1.483301 1.858102
## [484] 1.942064 1.255420 1.923332 1.425440 1.673646 1.081180 1.909824
## [491] 1.292520 1.015994 1.283820 1.953144 1.724540 1.509353
```

```
length(unifsample[(unifsample>1)=="TRUE"])
```

```
## [1] 496
```

```
(length(unifsample[(unifsample>1)=="TRUE"]))/1000
```

```
## [1] 0.496
```

(5). Generate a vector called "normsample" containing 1000 random samples from a normal distribution with mean 10 and Standard Deviation 2.(1 pt)

```
rnorm(1000,10,2)
```

```
##    [1]  9.583169 10.910425  9.998943 11.880978  9.142060 11.233269
```

```
##    [7] 12.228723  8.533090 12.603359 13.511440  8.956912 11.340038
##   [13] 11.429490  8.246141  6.646761 10.968509  9.224010 10.603560
##   [19] 13.213577  8.799678  6.430496  9.758007  9.670952  9.937130
##   [25]  9.761011 14.290837 10.520024  9.976805 12.900093 12.737863
##   [31] 11.904783 10.003223  8.973102  7.857261  6.430608 10.211296
##   [37] 12.699148  9.428987  8.776809  8.276782  7.595142 13.156896
##   [43] 11.184764 13.895316 11.536687 10.561798 10.978559 11.654742
##   [49]  8.399217  7.004494 10.777484  8.196259 12.726343 11.748446
##   [55]  9.475183  8.074012 11.525377 10.613563 11.422691 12.234250
##   [61] 11.328828 10.926578 11.700791 10.186656  8.784182  9.483509
##   [67]  6.417116  9.142720  8.065973 10.144991  8.273743 10.330084
##   [73] 16.046278 10.891592  8.856315 11.221709  6.751688  9.397854
##   [79]  9.276644 12.147308 14.712705  9.946074 12.399394  9.795702
##   [85] 12.013157 11.260679 11.240378  7.869801  7.112892  9.614752
##   [91]  4.420806  9.623280  8.248375 11.078106  9.949908 11.497324
##   [97] 11.160501  8.603608  7.617714 12.568128  8.442392  8.154473
##  [103]  7.182227 14.923931  8.501891 11.918730  9.656986  6.718452
##  [109]  8.012245 10.591684  7.340191  9.240205  8.667530 11.139391
##  [115] 10.071648  9.230623 12.481467  9.297902  9.133932  8.238263
##  [121] 11.990014 10.706532 10.783822 10.709665  9.918244  9.912895
##  [127] 10.373341 11.442252  8.789492  8.985811  9.914173 12.405989
##  [133]  8.353279  9.087340 10.091689 10.406883 12.138522  6.165902
##  [139]  6.890687 13.147664  9.103489  9.193388 11.122544 12.180580
##  [145] 10.873170  7.600323  7.645539 11.067176  9.757868 10.021897
##  [151]  9.774058  4.568548  9.996031 10.041824  8.668424  8.452226
##  [157] 11.856966  7.595602  8.194198 11.071753  9.775609 10.455165
##  [163]  9.931284  9.158675  9.592857 11.664825 10.438156  8.574963
##  [169]  9.317723  8.183148  7.904860  7.131086  9.667141 10.390360
##  [175]  9.952086  9.409050 15.046322 10.063098  9.193537  9.438092
##  [181]  6.453266  8.308566  8.934760  9.374921 11.435064 11.448716
##  [187] 11.193670  8.060367 11.096403 10.870815 13.648755  7.816671
##  [193] 12.109773  8.726051 12.475551  8.397784  8.965371 12.646864
##  [199]  7.574045  9.954995 15.098222 11.038617 10.399850  5.353519
##  [205] 11.179644  6.770994  9.733802  8.428369  9.839784 10.942360
##  [211]  9.597794  8.812577  9.072082  9.931222 11.617942 10.414536
##  [217]  7.960830 10.614103 12.692560 13.550691  7.373968  8.976030
##  [223]  9.665683  7.507663  8.715294  7.437468 10.622977  9.263524
##  [229] 13.355203  8.210730 12.834917 11.251754  6.138616 10.423895
##  [235] 10.698883 10.974258  8.991948 10.855739  8.028800  8.097772
##  [241]  9.023612 14.484494  8.161048 10.205577  9.921754 12.487210
##  [247]  7.764956 12.776673 10.050379  8.315829  8.153506 10.199554
##  [253]  7.784278  9.608732 13.081846  9.377154 11.155754 11.307617
##  [259]  8.244772  7.579800 10.661786  9.533680  9.116721  8.858811
##  [265] 11.030943  8.588222  7.558952 13.337403 10.517951  8.134131
##  [271] 11.102006  9.843511  9.390461 10.404735  7.482037  7.137404
##  [277] 10.790497 11.462853 10.071920 11.347749 10.601826 10.945018
##  [283] 13.274458  9.894101 10.901703  9.437044  7.209393  6.642210
##  [289] 11.972763 10.296390  9.150135  7.884738  9.535076 10.881533
##  [295] 10.808150 11.131273 12.302656 10.146770 12.152379 12.280180
##  [301] 11.826213  9.842776  8.946662 11.048823 13.132285  9.011433
##  [307] 12.686786  6.709987  7.719854 10.132118  9.488268 10.772368
##  [313]  5.692356  5.080504  7.138089 11.396461 11.254800  5.697782
##  [319] 11.874977  8.044470  9.262846  9.676418  9.978084  7.717255
##  [325] 10.874421  5.629577  9.786270  9.728436 10.084750 11.702332
```

```
##  [331] 10.837386 10.493287 12.122546  8.827070 10.728548 13.840291
##  [337]  6.517175 13.272041  8.839810 12.373077  4.287421  8.281881
##  [343]  7.568627  7.790251 10.002541 10.020011  9.171094  9.612254
##  [349] 10.482051 10.534818  6.595933 10.197133 10.357449  9.804748
##  [355] 14.629661  7.630068  9.717101 10.087931  9.891914 12.685275
##  [361] 10.219224  6.938356 11.545233 11.425031 10.756518 10.147204
##  [367] 12.807466 11.766951  7.431998  6.141643 10.120428 11.665653
##  [373]  8.471690  9.672637  9.086914 11.985519  8.266609 12.309080
##  [379]  9.749073  8.724481  9.704732 10.416574  6.581308 10.683119
##  [385] 13.234869  9.965604 10.599949  7.972519 12.872170 10.611945
##  [391]  8.934006  8.130017 11.860439 12.329011  9.268330  8.219299
##  [397]  9.562635 12.451294  9.059986  7.938150  8.655442  6.600415
##  [403]  5.742939 10.249235  8.508229 11.991255 10.906405  6.987004
##  [409] 11.029612  8.968748  7.425068  9.224108  9.877655  6.690839
##  [415]  6.796242 11.115174  6.261897 11.294518 13.258661 10.796831
##  [421]  8.259213 12.581210 13.843227  8.988850 14.944825 10.883027
##  [427] 12.753439  9.480173  7.661533  7.573589  9.468412  8.627454
##  [433]  7.848801 11.574268  8.408345 10.951790  8.444080  8.694236
##  [439]  3.949750  7.196789 10.728985 14.394720 10.704169 11.599482
##  [445] 10.808648  9.116829 12.262151  9.533556  7.947553 14.797389
##  [451]  6.356860  9.417951 10.170763  9.476880 11.293475 11.390551
##  [457]  6.875291 12.448637 11.263370  8.725954  8.695900  8.613209
##  [463] 13.141208 11.136198 12.160977 11.610700  8.718440 10.502417
##  [469] 10.570597 10.122749  9.077476 13.572425 11.237430 11.191269
##  [475] 10.295308 11.152901  6.451332 11.119497 10.276926  7.582981
##  [481]  9.153147 11.181965 10.880816  7.885582  8.649211 10.786744
##  [487]  7.116972  6.982843 10.446756  5.741005  6.899611 13.667045
##  [493]  9.001851  7.285786  9.125714  9.749580 11.254968  8.986933
##  [499]  9.346087  8.770813 11.041430 10.799672  7.215458  7.909293
##  [505] 10.025407 12.993267 10.815685  8.038568 12.143982  8.881977
##  [511]  9.204843  9.168868  9.249851  9.601913 11.591425 11.327845
##  [517] 10.120172  8.570699  8.932775  9.095302  7.476181 11.150811
##  [523] 10.289777 10.085599  7.670113  6.856491  8.561372  9.941825
##  [529]  9.951255  8.808497  8.765566  8.356649 13.243441 11.456267
##  [535]  9.007789  9.883558 12.606936 10.173506 11.115685  8.797663
##  [541] 11.517171  8.966103  4.978352 11.570607 10.012465  9.614628
##  [547]  9.550788  9.349121  8.702624 10.475123 12.908822  9.001371
##  [553]  8.896319  8.098115 10.517429 10.605081 12.760591 11.598393
##  [559]  8.386858 10.323703  6.569856  7.681673  7.983420 10.453891
##  [565]  5.462152 11.888355 10.718584 10.578581  9.692639 11.388982
##  [571] 11.501745 11.464372 11.755072  9.933301  9.370105  8.332032
##  [577] 11.640378  9.813490  9.624044  8.879743  8.760321  8.740803
##  [583] 11.208474 11.486799  9.288095 13.527164 10.448295  7.240316
##  [589]  6.613755  7.258202  9.645860  8.431849  7.360250  7.010263
##  [595] 12.341233  9.312060  8.000158 12.794822 10.716979  9.787847
##  [601] 11.595851 12.444729 11.216057  9.246418  5.752510  8.720744
##  [607] 10.119459  8.351383 10.757851  9.369882  7.594479 10.464871
##  [613] 11.950262  9.478302  9.951209 12.954353  9.964883  8.073782
##  [619]  9.143365 11.803306  8.486794 12.590151 10.714164  8.854387
##  [625]  9.471847  9.216060  8.884980 11.605603 13.645422  8.999038
##  [631]  9.092416 13.495877  9.218131  8.679079 11.877689  9.914880
##  [637]  8.837995 10.447305 11.425802 12.408286 11.761530  9.431113
##  [643]  9.891218 12.466911 12.124423  6.186066  6.493723 11.052079
##  [649]  8.788473 11.455283  7.029229 13.101493 12.115354 12.610304
```

```
##  [655]  9.148169 11.182314  9.022742  7.733945 10.837432  8.508353
##  [661]  8.472685 12.158283 12.979495  8.116752 12.164375  9.649801
##  [667]  9.997231 10.154890  9.520452  9.587131  5.084584  8.885336
##  [673]  9.382328 10.238052  7.496814 11.938133 13.831248  8.915371
##  [679] 12.364398 10.377732 11.895807  8.353994 11.531154  9.864710
##  [685]  9.286835 11.069849  9.119779 10.349129 11.591173  8.608590
##  [691] 13.989765 11.133495  9.694741  8.296829  9.959388  9.721327
##  [697] 10.245913 10.894575 11.888618  9.279986  6.423574  8.592632
##  [703] 12.354172  7.681902  6.914885 11.392144  8.918256 10.352200
##  [709] 10.200509 11.235784  9.309471  8.602318  6.775278  8.380887
##  [715]  7.610574  6.642063  9.991408 11.734361 10.258616  8.005683
##  [721]  8.952779  7.141939 11.272163  8.797677  9.349226  8.113357
##  [727] 10.565188  9.623231  8.367783 11.601586  8.292299  6.590232
##  [733]  7.921277  8.232118  7.746902 12.113823 12.371705 10.776463
##  [739] 10.665390  4.812854  7.886780  6.988139  9.700654  8.843780
##  [745] 13.824935 11.582855 10.364950 10.719511 14.339711  8.366665
##  [751] 10.747900  6.322103 10.081443  6.965954  5.075909 12.344061
##  [757]  7.997197 12.721915 12.663100 12.021535 11.262782  8.982252
##  [763] 13.502867  8.856706 13.502836  9.181138 12.984534  9.628907
##  [769]  7.318657 10.681250 10.259371 11.267625 11.773559 14.330358
##  [775]  6.487808  6.158264 11.480241  7.621147  5.721151 11.179115
##  [781]  8.480036 11.478140  6.045834 11.925770  9.320543  8.844337
##  [787]  9.405753 10.896964 12.260626  5.471157  9.169700 11.306857
##  [793]  9.011275  7.226577 10.253503 12.180993 13.133007  9.810196
##  [799] 11.598852 13.589014  4.607627 15.819467 14.280575  7.685462
##  [805] 12.380339  9.322203  7.560102  7.849580  9.699567 11.305125
##  [811]  7.620672  8.062471 13.489050  9.339411  4.922380  8.478504
##  [817]  9.139998 11.221313  7.928801  8.456282  9.331741 11.796614
##  [823]  9.011109 10.346787  9.680765  6.275727  9.762392  9.914465
##  [829]  7.615058 11.489898  9.435617  7.312922  7.018747  8.762704
##  [835]  9.382964 13.010456  9.034204 11.804360  9.523938  6.574777
##  [841] 12.216571  9.535541  5.772465 11.501316 12.157384  8.450864
##  [847]  7.239901  8.215342 11.963916  8.629767 12.933870  8.082378
##  [853]  7.626889  8.388276 11.563871 10.569612 10.407083  9.859169
##  [859] 10.726175 12.299283 11.454412  5.893762 12.159217 15.353441
##  [865] 11.428679 11.684356  5.886175  8.681940  7.664844  7.582614
##  [871] 10.929308 10.475909 11.829465 13.355042 12.949111 11.244871
##  [877]  5.996948  8.694364 11.457935  8.242208 10.598268 11.309849
##  [883]  9.225048 13.347415  7.127614 11.274104  8.270034 10.576613
##  [889] 11.888430  7.781904 10.998938 10.099727 10.584421  6.895084
##  [895]  5.807237  9.639616  7.249999 10.643131 10.639341 11.038824
##  [901] 10.482918  8.635149 14.377175 14.178045  9.608422 14.371988
##  [907]  9.756051 10.533886  9.401181  7.396812  6.625238 12.698751
##  [913]  9.061946  9.576297 10.130422  8.121231 11.491899  8.235253
##  [919]  8.278754  7.083502  9.449469 12.191853  8.678136  7.883135
##  [925] 11.939130  8.879750  8.255147  9.853238 11.403936  9.204779
##  [931] 15.511942  9.954404 11.912793  9.288140 11.450662  9.530019
##  [937] 10.751530  7.750533  8.788706  9.344261 10.198124  7.923990
##  [943] 10.862655  6.753428  8.185648 12.839294 10.132342  9.768707
##  [949] 13.730962 10.413216 11.481673  9.774440 10.626531 11.246485
##  [955] 12.179507 13.523868 11.140979 11.062222 12.603171 11.974954
##  [961]  9.942786  8.999287 10.640056 10.904145 14.393448 10.934762
##  [967] 11.129522  9.150071 14.790686 12.895024 11.574345 10.597865
##  [973]  9.222571  6.494509  8.752292  9.795269 10.401242 11.481754
```

```
##  [979] 10.689919 13.667746 12.038598  9.697540  7.662027  8.874235
##  [985]  8.219305  9.624699 10.303307  7.307713 11.893936  7.917530
##  [991] 12.011829 14.353760  8.908551 10.058637  9.748790 11.757716
##  [997] 10.079906 10.889335 11.803249  7.607244
```

```
normsample = rnorm(1000,10,2)
```

(6). Calculate the mean and sd of the 1000 values "normsample". (1 pt)

```
mean(normsample)
```

```
## [1] 9.979191
```

```
sd(normsample)
```

```
## [1] 2.052118
```

(7). Use logical operations (>,<,==,. . . .) to calculate

the fraction of the values in "normsample" that are more than 9. (1 pt)

```
normsample[(normsample>9)=="TRUE"]
```

```
##   [1] 10.772581 12.821875 11.264342 12.111180  9.858967 11.938743  9.780316
##   [8] 10.563723 12.979108 13.191403  9.424366 11.564303 10.770995 11.199612
##  [15]  9.332188 11.531689 11.337666 13.346455 11.979326 11.603865  9.724914
##  [22]  9.504445 12.142662  9.793274 10.389096  9.650603 13.197289  9.686439
##  [29] 10.767604  9.009868  9.342517  9.459097 10.602136  9.848541  9.673070
##  [36] 12.224418  9.691642 11.461083 11.503281  9.866198  9.299929 10.934867
##  [43]  9.693991 11.197006 11.995083  9.337306 14.711793 11.632044 11.140140
##  [50] 10.571734 12.686993 11.143078 10.470206 10.537381 12.167714 10.218116
##  [57] 11.086611 12.229713 10.900620  9.149972 10.261367 10.023615 11.350027
##  [64] 10.326221 12.655469  9.662803 10.839431 11.410838 10.654406 10.682525
##  [71] 12.851965 12.359505 11.215862 10.354102 11.550891 12.092940  9.656762
##  [78] 11.514039 10.880540 10.769396 12.578919 10.738178 10.258903  9.020154
##  [85] 13.434479 10.553546  9.296403 10.189936 10.796405  9.034900 10.391296
##  [92] 11.022982  9.761788 11.216999 11.778900  9.817269 12.769538 11.392683
##  [99]  9.106983 10.618304 10.057570  9.437326 15.233319 10.222724 12.083911
## [106] 11.844844 10.867526  9.441535 12.093573 15.851924  9.154953 12.671837
## [113]  9.899682 11.610462 12.350057 10.554751 11.117538 15.672496 12.694282
## [120] 13.577120 15.246792 11.421097  9.182815 10.756123  9.926504  9.665944
## [127] 12.503912 12.720599 10.034079 10.450826  9.949450 10.070770 12.065633
## [134] 12.371171 11.386832  9.483154  9.282528 11.311816  9.767797 13.766327
## [141] 11.104195 11.730546 11.227715 10.094375 10.633311 11.686201 12.058228
## [148] 10.432709 13.667659 12.261883  9.019643  9.793211 10.046136 10.112061
## [155]  9.243949 13.090669 10.101532 14.626400 12.817220  9.034425  9.089828
## [162] 12.770841 10.266269 10.752433 12.404141 11.754045 10.333359 10.972960
```

```
## [169] 13.074697 11.635600 11.605093 11.465244 10.211869  9.144811 12.881770
## [176]  9.876481  9.030693 10.358951  9.747263  9.892905 10.918675  9.817811
## [183] 10.570873  9.185313 11.045412  9.274153 10.306192  9.125741 11.100079
## [190]  9.514894 12.596402 11.956101 11.014682 10.642155 10.010183 10.402278
## [197]  9.675662 12.294080  9.315857  9.199276  9.717990  9.762491  9.164291
## [204] 10.892792 10.711997 10.312672 11.352393 10.946527 10.733891 11.108678
## [211] 10.146180 12.980115 12.742616 12.751221 10.877064  9.852845  9.462520
## [218]  9.560071 10.814236 10.085143  9.302500 10.568769 10.512773 12.751823
## [225] 11.884458 12.704727  9.538174 11.523805 15.317799 10.648193  9.330629
## [232] 11.665687 11.720321 11.143005 11.594496 10.731960 10.935732 10.475068
## [239] 14.251164 13.104334  9.160266 12.626642 11.984707 10.490049  9.205947
## [246] 10.039018 10.026584 11.296581 10.701285 12.071294  9.981156 10.784168
## [253] 11.297930 10.648057  9.377963  9.008573 10.451316 10.721276 11.026330
## [260] 11.971056 10.416962 11.648795  9.376686 12.981801 14.385851 11.597279
## [267]  9.868634 10.485710  9.550957 11.556841 11.083116 10.919500 10.196365
## [274]  9.148981 10.538775  9.167630 13.153175  9.795305  9.740002 12.378279
## [281] 11.977105 10.271048  9.888105  9.467475 12.369711 12.280533  9.510314
## [288] 10.737766 11.737186 11.450323 11.409116  9.389639 10.892184 10.004506
## [295] 10.242457  9.952731 10.649486 10.243563 12.119702 11.860884  9.019470
## [302]  9.011970  9.290661 10.587225  9.973271 14.038873  9.946731 11.216506
## [309]  9.194885 13.532205 11.785737 10.417325 11.207501 11.869033 10.426820
## [316] 10.057766 11.065637 10.987825  9.746642 13.134937 11.453553 12.645388
## [323] 11.371396  9.805951 10.752775 10.131334 10.040454  9.128225 11.144240
## [330] 13.683772 10.878430 12.975656  9.746272 10.313675 11.160895  9.082317
## [337] 15.222716 11.491543 13.297051 11.841558 11.780518 11.752268 10.316215
## [344] 10.053790 12.140934  9.223395 11.072158  9.295740  9.645702 11.596975
## [351] 11.368000 13.026736  9.349482 10.865602 10.636031 11.329403 10.986941
## [358] 11.234668 11.788088 11.815110  9.351216 10.361343  9.469600 13.276156
## [365]  9.994859 12.018869 11.379753 10.643440 13.085497 10.434886 11.402749
## [372] 11.022286 11.766277 11.463387 15.250364 10.052668  9.844576 10.618587
## [379] 13.048638 12.863629 11.245846 12.773175 12.409908 14.719803  9.119171
## [386] 11.334256 11.677008 10.986775 13.453127 11.424661 10.895039 11.731969
## [393] 10.085988 11.718166 11.050261  9.092011 11.267155 13.069112 10.890085
## [400]  9.468845  9.759968 10.242722  9.266615 11.640420 12.080553 10.559865
## [407] 11.675536 11.433854 12.325061  9.163100 11.037400 13.593885 12.392375
## [414] 12.059140 10.831735  9.656604  9.843497 10.720477 12.132795 11.972837
## [421]  9.398232 11.136665  9.618857 10.079287 10.439750 17.393015 10.732345
## [428] 13.556982 11.440640  9.625019 12.420789 10.631483 10.251703 12.676241
## [435]  9.606352 11.636913 12.548749 12.086982 11.005646 11.715191 12.350376
## [442] 13.099567 10.774812 10.571022 12.123539  9.983964 13.317445 11.642385
## [449] 12.244623 14.536462  9.480920  9.293174 10.943479 11.582455 12.010607
## [456] 10.239497  9.528578 13.526400 11.937487 10.947904 11.177453 12.625771
## [463] 10.342868 11.009005 10.751710 10.938331 10.457568 10.418270  9.239748
## [470] 11.116157 11.737214  9.178972 11.982810 12.258091 13.054499 11.693087
## [477]  9.122484  9.567861 14.565389 13.661730 10.571951  9.268706  9.885885
## [484] 11.586360 10.788103 11.208813  9.333134 13.520301 11.834145 11.838758
## [491]  9.491963  9.536559 12.320476 11.566526 13.374666  9.446316 10.413488
## [498]  9.043759 11.233096 11.563108  9.864054 11.030570 13.216721 12.233583
## [505]  9.128040 11.939524  9.895493 14.227543 11.938394  9.946898 12.322396
## [512] 11.375505  9.502382  9.953686 10.295109 11.169154 12.033652 12.334254
## [519] 12.279295 10.384582 10.876565 11.425728 11.091749 11.609111 13.845859
## [526] 11.852615 14.517628 12.415115  9.970892  9.316049  9.243619  9.026617
## [533]  9.807651  9.065736 11.827532 10.913315 10.022608 11.171373 11.200692
## [540] 10.277977 10.562523  9.171507 11.572011 11.562903 10.976334 12.629454
```

```
## [547] 13.908836 13.452830 10.517331 11.122773 10.642922 13.948692 12.578156
## [554] 11.353886 12.091656  9.038584 10.564527 10.245641  9.671063 10.462604
## [561] 11.506212 12.270256 11.931358 10.623974 10.056009  9.653182 10.111899
## [568] 11.278471 13.375839  9.602019 12.301306 11.483579 10.164492  9.826954
## [575]  9.801541  9.764058 10.711488 13.783299 10.548864  9.151368 13.236112
## [582] 12.919037  9.787871 13.330119  9.533482 11.887178 10.247023 11.365227
## [589] 12.886232 10.047471  9.208950 13.042808  9.597083 10.953297 11.038502
## [596]  9.975822  9.819270 10.647820 12.262273 10.262213  9.425575  9.317921
## [603] 11.174351 10.211476 11.448141 11.425336 16.556397 12.454172 11.813360
## [610]  9.545322 10.087414 12.119791  9.523566  9.489154 12.670357  9.619503
## [617] 10.476507  9.969764 10.154263 10.175822 12.185656 11.633563 11.473257
## [624] 11.996900 14.917237 15.144834 10.885538 12.438719  9.283599 11.091302
## [631] 12.999543  9.316376 10.445324 12.182839 10.159491 12.200604 12.597170
## [638] 12.745077  9.230181 11.402048 13.007308  9.659946 10.572158  9.972586
## [645]  9.741099  9.886764  9.175328 11.449454  9.393747 11.268345 11.949929
## [652] 10.933581 11.094778  9.865844 10.925154  9.778190 12.429389 10.205507
## [659] 10.376173 11.101848 10.039300 10.333623 10.968650 13.232354 10.711243
## [666] 12.973510  9.959143 12.356701 11.169498 10.404978 11.098430 11.520266
## [673] 12.852118 13.500004 12.762259  9.272740
```

```
length(normsample[(normsample>9)=="TRUE"])
```

```
## [1] 676
```

```
(length(normsample[(normsample>9)=="TRUE"]))/1000
```

```
## [1] 0.676
```

(8). Find the area under the normal(10, 2) curve to the right of 9.

This should be the probability of getting a random value more than 9.

```
pnorm(9,10,2,lower.tail = FALSE)
```

```
## [1] 0.6914625
```

the total area under a normal curve equals 1. I expected a value within the range of 0 to 1 similar to the probability of an event I got a value of 0.6914625 as expected.