Assignment1

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R Markdown

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When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

##******Assignment 1 *********

```
#getwd() is used to know the current working directory
getwd()
```

```
## [1] "C:/Users/lavak/OneDrive/Documents/R"
```

```
#setwd() is used to set the working directory as per our requirement
setwd("C:/Users/lavak/OneDrive/Documents/R")
```

```
##Reference:https://www.kaggle.com/rupakroy/credit-data/version/1
##the data set csv file credit_data.csv is downloaded from site:https://www.kaggle.com/rupakroy/credit-
library(readr)
credit_data <- read_csv("credit_data.csv") ##variable is assigned to store the data from credit_data.cs
```

```
## Rows: 2000 Columns: 5
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## dbl (5): clientid, income, age, loan, default
```

```
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
##read_csv is used to read the data set
View(credit_data) ##To view the entries in the data set
```

```
#To display the data of credit_data file
credit_data
```

```
## # A tibble: 2,000 x 5
##    clientid income   age   loan default
##       <dbl>  <dbl> <dbl>  <dbl>   <dbl>
##  1        1 66156.  59.0 8107.        0
##  2        2 34415.  48.1 6565.        0
##  3        3 57317.  63.1 8021.        0
##  4        4 42710.  45.8 6104.        0
##  5        5 66953.  18.6 8770.        1
##  6        6 24904.  57.5   15.5       0
##  7        7 48430.  26.8 5723.        0
##  8        8 24500.  32.9 2971.        1
##  9        9 40655.  55.5 4756.        0
## 10       10 25076.  39.8 1409.        0
## # ... with 1,990 more rows
```

```
##Summary function is used to calculate the descriptive statistics like median, mean, min and max for g
##Here clientid, income, age, loan, default are variables of credit_data data set
summary(credit_data $income)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   20014   32796   45789   45332   57791   69996
```

```
summary(credit_data $clientid)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     1.0   500.8  1000.5  1000.5  1500.2  2000.0
```

```
summary(credit_data $age)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##  -52.42   28.99   41.32   40.81   52.59   63.97       3
```

```
summary(credit_data $loan)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
##     1.378  1939.709  3974.719  4444.370  6432.411 13766.051
```

```
summary(credit_data $default)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.0000  0.0000  0.1415  0.0000  1.0000
```

#Discriptive statistics

```r
library(fBasics)        ##To load the library fBasics
```

```
## Loading required package: timeDate
```

```
## Loading required package: timeSeries
```

```r
options(scipen =999)    ##To convert all values to decimal
#basicStats function is used to calculate the descriptive statistics like median, mean, min and max for
basicStats(credit_data $income)
```

```
##             X..credit_data.income
## nobs                   2000.000000
## NAs                       0.000000
## Minimum               20014.489470
## Maximum               69995.685580
## 1. Quartile           32796.459720
## 3. Quartile           57791.281670
## Mean                  45331.600018
## Median                45789.117310
## Sum                90663200.035740
## SE Mean                  320.346413
## LCL Mean              44703.352195
## UCL Mean              45959.847841
## Variance          205243648.720479
## Stdev                 14326.327119
## Skewness                 -0.042557
## Kurtosis                 -1.203502
```

```r
basicStats(credit_data $clientid)
```

```
##             X..credit_data.clientid
## nobs                     2000.00000
## NAs                         0.00000
## Minimum                     1.00000
## Maximum                  2000.00000
## 1. Quartile               500.75000
## 3. Quartile              1500.25000
## Mean                     1000.50000
## Median                   1000.50000
## Sum                   2001000.00000
## SE Mean                    12.91317
## LCL Mean                  975.17531
## UCL Mean                 1025.82469
## Variance               333500.00000
## Stdev                     577.49459
## Skewness                    0.00000
## Kurtosis                   -1.20180
```

```r
basicStats(credit_data $age)
```

```
##             X..credit_data.age
## nobs               2000.000000
## NAs                   3.000000
## Minimum             -52.423280
## Maximum              63.971796
## 1. Quartile          28.990415
## 3. Quartile          52.587040
## Mean                 40.807559
## Median               41.317159
## Sum               81492.696079
## SE Mean               0.304881
## LCL Mean             40.209641
## UCL Mean             41.405478
## Variance            185.626168
## Stdev                13.624469
## Skewness             -0.307501
## Kurtosis              0.541518
```

```
basicStats(credit_data $loan)
```

```
##             X..credit_data.loan
## nobs                2000.000000
## NAs                    0.000000
## Minimum                1.377630
## Maximum            13766.051240
## 1. Quartile         1939.708847
## 3. Quartile         6432.410624
## Mean                4444.369695
## Median              3974.719418
## Sum              8888739.389417
## SE Mean               68.097438
## LCL Mean            4310.820307
## UCL Mean            4577.919083
## Variance         9274522.216966
## Stdev               3045.410024
## Skewness               0.623348
## Kurtosis              -0.342145
```

```
basicStats(credit_data $default)
```

```
##             X..credit_data.default
## nobs                   2000.000000
## NAs                       0.000000
## Minimum                   0.000000
## Maximum                   1.000000
## 1. Quartile               0.000000
## 3. Quartile               0.000000
## Mean                      0.141500
## Median                    0.000000
## Sum                     283.000000
## SE Mean                   0.007795
## LCL Mean                  0.126212
## UCL Mean                  0.156788
```

```
## Variance                  0.121539
## Stdev                     0.348624
## Skewness                  2.055630
## Kurtosis                  2.226730
```

```
#Different type of operations are done on the variables
mean(credit_data $income)        ##To calculate the mean
```

```
## [1] 45331.6
```

```
sd(credit_data $clientid)        ##To calculate the standard deviation
```

```
## [1] 577.4946
```

```
max(credit_data $loan)           ##To calculate the minimum value in the specific variable data
```

```
## [1] 13766.05
```

```
min(credit_data $income)
```

```
## [1] 20014.49
```

```
log(credit_data $loan)           ##To transform the data into log
```

```
##    [1] 9.0004255 8.7894689 8.9898126 8.7166410 9.0791034 2.7407496 8.6521754
##    [8] 7.9966550 8.4671255 7.2507990 8.3781676 9.1328376 8.6815654 8.4679583
##   [15] 7.5231406 8.2883553 8.2778045 8.0949087 8.0575176 8.5102725 7.0458794
##   [22] 8.3532750 5.4054766 8.5091451 8.6061684 8.5869585 9.1690272 8.7604253
##   [29] 7.6413848 9.2938712 8.7251475 7.9592795 8.3478992 8.8917250 7.4549651
##   [36] 5.8323134 7.6540644 8.3725616 6.8760957 8.1576121 8.8587367 8.3351404
##   [43] 8.3808936 8.3492523 8.6535735 7.0776792 8.4953994 7.5034743 7.4893974
##   [50] 7.4134097 8.7963943 8.1150379 7.4650092 8.8760053 5.5898531 8.6215170
##   [57] 8.3813678 8.0311726 7.7803447 8.6907131 7.6636881 7.6226870 8.5469598
##   [64] 6.9920223 8.3130146 8.5071231 2.0809499 8.6906123 7.8981004 8.4385823
##   [71] 8.6983282 8.6312662 8.6823687 8.1625882 7.6591643 7.4764629 7.5614389
##   [78] 9.1298786 8.9425466 8.9076156 8.8890491 8.9738025 8.5953285 8.3455273
##   [85] 8.4149411 8.9500550 8.9954995 7.3222622 7.7743372 6.8658700 8.9253257
##   [92] 5.9483158 8.3875357 6.6261903 7.0764043 8.3469188 7.3916109 8.3303547
##   [99] 9.1696616 8.8362731 8.8945694 7.7466573 7.6015430 9.2687114 9.3986652
##  [106] 4.9537391 8.2759630 5.2516935 5.4308155 7.6540843 5.1090080 4.6642948
##  [113] 7.9362141 7.8741983 7.2297758 7.7846722 6.6897142 4.0283145 7.4920638
##  [120] 7.3945186 8.2384315 8.9563686 7.2650113 5.1836575 8.1985296 7.3098712
##  [127] 7.7388417 6.3142691 8.9044584 6.9419237 7.5016126 8.3559093 8.7089397
##  [134] 8.3578441 8.6159694 8.4284773 9.0090448 8.0996305 8.4455359 8.5230736
##  [141] 8.7834297 8.3982106 8.3404161 8.6493305 7.9720390 8.5359502 8.3740987
##  [148] 8.6643894 8.7726710 8.5905478 9.2936002 7.8953245 9.4494835 8.1069758
##  [155] 8.0576819 9.1984678 7.3847448 9.3434661 9.4333271 7.9772030 8.6150669
##  [162] 6.0081269 8.7017045 7.1030363 8.5721980 7.2521461 8.4985554 7.7794045
##  [169] 7.9038774 7.6239767 7.4306098 9.2790920 7.6288835 7.0306234 8.6112105
##  [176] 6.7074837 7.4656190 8.9982070 7.4969948 8.6718974 8.6164062 9.1684588
```

```
##  [183] 8.7807644 5.9460720 9.2492359 9.1803741 8.8921064 4.9121524 8.6673185
##  [190] 8.7622344 8.2500700 8.1771020 8.4011830 8.8233314 7.0459694 8.7580939
##  [197] 9.1943208 7.7758917 7.9197521 5.9788877 9.2854731 8.7177758 7.3032239
##  [204] 8.3779357 7.4724336 8.3225119 9.2803779 7.7312965 7.6782268 9.1367558
##  [211] 7.8737521 6.7397701 6.7551999 8.1147337 8.5670853 8.7704176 6.0288577
##  [218] 9.3112541 8.4855317 8.2516751 6.3934972 7.0652344 8.6816972 7.5856843
##  [225] 7.9151439 8.9267966 8.1055725 8.3559972 9.0362745 8.9720500 8.9521616
##  [232] 7.2764196 7.7686549 8.7759758 9.2424290 8.8996275 8.7062871 8.9916722
##  [239] 8.9940862 8.1435934 8.9068075 6.6576678 8.5515116 7.5341884 8.1317985
##  [246] 7.2827939 8.5441894 7.9190217 8.5257859 8.0974911 7.8052204 6.0950732
##  [253] 7.5236496 8.3758619 8.3112515 6.9704361 8.9749652 8.6359964 8.7852285
##  [260] 8.2614461 7.3121471 7.6027276 6.4257418 6.7663789 8.4991408 9.0320046
##  [267] 7.7498423 7.9684735 6.1959204 8.4776145 6.2046006 8.7085148 7.4343385
##  [274] 7.9474342 9.0488604 9.2739822 7.0948869 8.3182826 8.1657766 8.6744379
##  [281] 6.9250019 8.7834195 8.9111999 9.0962978 8.4798601 8.2816911 7.5385268
##  [288] 7.5252300 8.2016432 8.1874389 6.3180458 9.2527746 9.1702992 7.2779883
##  [295] 8.0164061 8.7546105 7.8866874 8.6393139 7.9950525 6.6351883 8.3296589
##  [302] 8.8157942 7.5865775 8.2868124 4.0428929 9.0860444 8.5971789 6.3415381
##  [309] 8.7752941 8.4232949 8.4076377 7.5614632 9.1534649 7.6380037 7.3184675
##  [316] 7.5484405 8.2092380 8.6359438 8.1890501 5.2301888 4.5996509 6.7332103
##  [323] 8.6583192 8.5351103 8.9416280 9.0774593 8.3460407 8.6917268 8.6462889
##  [330] 8.4313024 8.4835545 7.7946793 7.5982094 8.7193321 7.6575367 8.9957005
##  [337] 8.2952961 6.3811357 9.1950411 8.4199898 8.7422562 5.9163123 9.3866866
##  [344] 8.8248846 8.6339477 8.9565829 9.1977654 8.6538894 6.5850582 8.6410925
##  [351] 8.5579287 7.7812075 8.6907507 8.8656312 5.4307955 9.2124431 8.2930009
##  [358] 8.8803561 6.6118624 8.7296420 7.8588301 9.0760670 7.5707906 8.5778163
##  [365] 8.3034354 6.8399872 6.9774610 9.0021172 6.7332460 9.0314193 8.5855173
##  [372] 9.1412799 8.5065990 8.1734976 9.2906646 7.5101658 8.6011839 8.9720421
##  [379] 8.9765546 7.7625499 8.7680088 8.0494745 7.8493086 8.8693638 7.9824109
##  [386] 7.9258215 8.0590023 6.6201627 7.4708152 8.2806853 6.4100260 6.1251135
##  [393] 7.6517782 8.0167291 6.5230037 7.7404114 8.4164894 7.9504983 7.2350778
##  [400] 7.8117161 8.4321244 7.0003044 9.3535785 7.5304215 8.4428370 9.4179692
##  [407] 7.9283458 8.3017211 7.4212882 7.7589625 8.5079049 8.0859879 8.9042278
##  [414] 8.2759167 7.7074601 8.6763882 8.5030697 8.2662855 7.1112839 9.0115151
##  [421] 8.1591086 8.9148626 7.6422223 8.7374976 5.8032184 7.7699620 7.7690297
##  [428] 9.2623117 5.8094671 8.8543908 7.3469261 4.7735799 8.2196662 9.2382471
##  [435] 7.1360067 8.6260931 8.8005315 7.7512808 8.0885657 8.3704817 9.2726957
##  [442] 9.3188426 5.1242900 8.1224831 8.5702666 8.1231618 6.7922766 9.3278112
##  [449] 8.5595540 5.6048254 9.3602893 6.8564163 9.0900385 8.5244181 8.9741399
##  [456] 8.7248472 8.2689445 8.0237413 7.8784244 7.8439526 7.9133091 9.1854483
##  [463] 7.9241679 8.6750830 8.7066795 4.7405745 6.8320265 8.0878704 7.8571024
##  [470] 9.2355392 6.6189330 6.7702504 8.5552282 8.1896232 8.6241020 7.0828274
##  [477] 8.1856995 7.7133056 8.7245333 8.2165036 9.4859004 9.0137850 8.6205896
##  [484] 6.5006543 8.6382030 7.9406985 7.2553923 8.3363877 9.1797350 7.4520540
##  [491] 7.5508009 8.8367915 9.2258340 8.3102228 8.2454191 9.0471172 8.4466711
##  [498] 8.5970791 8.7623096 8.0036864 9.3099761 8.4076990 8.6309075 6.7378552
##  [505] 8.1999721 8.2582856 9.1329667 8.6200785 9.3200727 8.4229095 6.8535099
##  [512] 7.1124167 7.8702588 7.2643380 9.2963259 6.8949350 9.3243381 8.4880699
##  [519] 7.2290479 9.1882304 8.5094141 7.7874971 7.5269661 8.8350415 8.7904513
##  [526] 9.0005162 7.8139864 8.1781640 6.2927124 8.1219859 8.6743287 9.2732280
##  [533] 8.8602039 6.6715687 8.9458943 9.0173318 8.7751830 8.3587722 9.2578673
##  [540] 8.0752399 7.9061365 7.9156110 8.2616304 8.4624214 8.1148681 8.7825433
##  [547] 7.4210207 5.9122258 6.3587617 8.7786623 7.1358892 7.9689703 8.5233400
##  [554] 9.2138944 8.9741568 8.1146407 6.8670762 8.5452189 7.6953691 8.7815785
```

```
##  [561] 3.7961013 9.2521990 8.0277110 8.2566302 6.9827147 8.8095600 8.3591668
##  [568] 7.7300708 9.1432392 9.0852492 8.4035369 8.1784479 8.0524043 9.0281207
##  [575] 8.2817720 8.0730686 7.0608987 6.2568544 8.1583256 9.0930156 8.5526978
##  [582] 8.7123784 8.4314757 9.0448739 5.0828788 9.2136839 8.2025362 6.8371075
##  [589] 8.8774806 9.2844035 7.0167483 7.1857373 7.8112331 7.4042605 9.1252009
##  [596] 7.8454334 8.5368169 7.9236565 6.8045344 8.9267523 6.9973027 8.0199356
##  [603] 8.8281182 8.4386423 7.4864436 7.1323916 9.2211612 8.5956738 8.7028150
##  [610] 8.5215118 8.3802395 9.1893304 8.7234155 8.1205217 8.1178176 7.9071569
##  [617] 8.6873704 7.9827070 7.6218987 9.0507855 9.0559321 8.4351491 8.5270713
##  [624] 8.0944212 6.9904831 8.4194869 8.7739491 8.3985042 7.5140262 7.7956884
##  [631] 8.5028117 6.6651451 7.8872283 8.9321706 6.9237674 7.3746119 7.7364950
##  [638] 7.4962240 8.8418109 7.7362421 8.3116643 8.1926447 7.8678133 7.2196071
##  [645] 7.7345398 7.9942256 9.4518655 7.9685389 7.6761557 9.2888520 6.4862114
##  [652] 8.0759230 7.7332067 9.0618108 8.4833215 7.4019792 9.2513089 8.8777930
##  [659] 9.1002275 7.9797619 8.5131879 8.8899930 7.2216108 8.4695306 7.7117473
##  [666] 6.5426667 7.9009520 4.9367345 6.2618754 7.4623206 7.9752065 8.2692286
##  [673] 7.6783651 8.7359134 7.9763921 8.1562285 8.9362473 8.4657038 6.5599395
##  [680] 9.1423270 8.5602151 8.0499456 6.7564547 6.5891942 9.2384036 8.6024939
##  [687] 8.9005439 7.9252591 8.6021364 9.1474722 9.4033613 7.1538334 9.0038352
##  [694] 8.8993601 6.9206073 8.3807050 6.2158056 8.9721702 7.6354871 7.1740215
##  [701] 6.1291258 9.2024768 9.0413755 7.3306624 9.1959605 7.7593998 6.5510172
##  [708] 8.8937855 8.8259814 9.1535806 6.8819892 7.2924255 8.8792606 6.4877577
##  [715] 9.1666588 8.9322875 8.4271914 8.1437047 8.1383738 8.7917192 8.6538617
##  [722] 8.2810007 8.8993310 6.8276600 7.2568945 8.6583265 7.3093549 6.9557599
##  [729] 8.5712533 9.0506294 8.5957692 7.6447913 8.8414123 3.5347110 8.2853247
##  [736] 9.2725122 8.7274929 5.9820041 7.2768801 8.9756721 8.7152747 7.7143550
##  [743] 7.8358216 7.5274218 7.8763950 8.3751285 6.2694395 8.8168877 9.4072863
##  [750] 8.9532129 8.8528777 8.3660691 5.4035618 7.3323815 8.7971537 6.6603611
##  [757] 5.7767980 8.5379261 9.1159994 7.9919230 8.6611332 8.5256228 7.9569599
##  [764] 9.0891990 6.2741174 8.4702981 7.7762866 9.4759133 7.4494653 8.4850992
##  [771] 7.0295856 8.2870631 8.8434626 8.4921557 8.3995809 8.5703177 9.0031992
##  [778] 8.7051908 8.8247142 8.2260952 8.3818922 5.9999339 8.2403913 7.9821092
##  [785] 9.0006278 8.8347720 8.7731974 8.4147625 7.9432255 7.0367269 7.7770487
##  [792] 7.0646188 8.8505929 8.2923349 8.5694492 8.3506874 8.0360795 7.7336861
##  [799] 8.0751290 6.2017052 6.2682466 9.0183786 7.8116635 9.3047896 7.9902799
##  [806] 8.5018389 8.2237337 8.9202644 6.5791771 7.3203519 8.7169826 8.2841788
##  [813] 5.9947759 8.3391612 7.0353718 8.8526720 7.8328302 8.7626700 8.2009212
##  [820] 6.9100931 9.2699526 7.8087189 8.3624620 8.1837188 8.5758733 8.3166819
##  [827] 8.2566054 9.1733449 9.0026516 8.5683835 8.7371053 8.1748676 6.6136456
##  [834] 7.2859647 9.2449526 7.7038991 7.7156382 3.9443016 9.2174102 5.3353425
##  [841] 6.8659924 8.9106926 9.2759097 8.2002357 9.0710722 8.1429300 6.2130240
##  [848] 8.5748846 6.9437176 8.4836932 8.3219807 8.8084641 7.6317804 7.3120199
##  [855] 8.4342333 8.7686666 8.4378019 8.8428791 9.3763255 5.9670076 8.4140261
##  [862] 8.5477049 7.4170427 7.9110460 7.3136561 0.3203643 7.8879314 7.2727450
##  [869] 7.1554242 7.0165333 8.2290465 5.5516455 7.3282054 6.8038135 9.2358052
##  [876] 8.5988250 7.6806943 8.3499370 8.4865966 7.6748997 9.0917352 7.9819640
##  [883] 7.3119938 7.6448760 9.1484123 8.9851579 8.3430059 8.3062879 7.4901656
##  [890] 8.2171559 9.1055132 8.9100192 8.6254118 6.6385077 8.0008803 8.7884319
##  [897] 8.8391004 7.8822000 8.0742776 7.9002837 7.2836096 5.6652037 8.9164074
##  [904] 7.8816432 7.4791970 8.3884678 9.0826900 8.8546869 8.1585805 7.7218205
##  [911] 8.2204716 6.0483608 8.7772560 6.9641727 8.3631898 9.1363017 7.4292398
##  [918] 8.9030173 4.5587149 8.3964439 8.2773823 8.6807355 8.3760044 4.6948246
##  [925] 6.5157670 8.3130865 7.8757089 7.3161983 7.9936039 7.3276941 5.5415484
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## [1996] 7.5635792 8.1614253 8.6166378 7.3918606 8.9063709
```

```
max(credit_data $clientid)       ##To calculate the maximum value in the specific variable data
```

```
## [1] 2000
```

```
#Here the transormations of ztransform and maxvalue have been performed.
ztransformed <- credit_data $income - mean(credit_data $income)/sd(credit_data $income)
ztransformed
```

```
##    [1] 66152.76 34411.99 57314.01 42706.37 66949.52 24900.90 48427.20 24496.98
```

```
##    [9] 40651.73 25072.71 64128.25 59433.68 61047.18 27264.83 63058.80 50498.56
##   [17] 43545.49 43375.01 20539.20 58884.19 22997.62 32194.46 23326.16 27842.64
##   [25] 65298.82 47448.47 63283.87 45724.30 59414.64 58839.73 48525.69 23523.14
##   [33] 67249.74 58883.69 57581.81 26286.81 25949.22 32460.93 60917.90 26575.37
##   [41] 66256.96 58784.29 62542.54 24378.79 67848.94 41722.45 41893.81 44376.57
##   [49] 28413.74 68424.00 35972.63 57593.19 29678.72 51653.77 24909.68 47758.66
##   [57] 22245.01 29721.31 52140.66 56574.56 37657.61 37400.63 31649.53 32724.54
##   [65] 69075.44 40619.03 37517.85 30732.64 24854.53 33177.04 66625.10 38561.77
##   [73] 33701.34 57015.32 40523.74 50824.82 40772.65 55463.99 38785.87 58071.68
##   [81] 57810.94 45187.56 36798.74 68808.62 30480.13 44927.23 43668.29 27609.75
##   [89] 53604.16 33033.52 64272.67 30670.67 58790.45 21050.33 42092.26 50357.51
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##  [145] 28978.89 36218.10 33547.96 43888.19 45145.72 58477.85 69576.76 52740.14
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##  [161] 27944.28 62243.56 40151.52 58624.39 33437.89 55600.62 31043.21 44704.94
##  [169] 23337.11 24827.02 31419.58 60474.07 26035.86 36183.68 39768.95 34727.00
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##  [201] 54616.78 38050.46 64715.50 43155.92 29442.35 25814.23 66353.69 56672.99
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## [1921] 64054.68 24451.03 40503.78 43417.88 55878.38 45914.44 52898.75 41180.66
## [1929] 25376.75 27510.92 44238.12 29073.17 60533.75 47878.79 49141.21 33704.64
## [1937] 46439.12 25599.79 61233.23 48184.18 29930.04 41024.74 49987.50 59789.34
## [1945] 35876.36 29099.06 30044.66 59296.00 64480.85 36349.26 66031.59 51647.11
## [1953] 31895.00 58777.07 67750.94 48497.10 55701.63 50455.79 48259.84 38752.00
## [1961] 68128.50 28988.26 35105.39 28855.43 22797.63 29569.81 21978.85 45573.67
## [1969] 55065.50 56437.85 68044.76 36272.57 52386.20 23675.21 37704.48 57750.40
## [1977] 30526.80 44019.10 58530.72 33699.37 40233.71 62615.99 50735.20 64463.60
## [1985] 64633.24 22368.36 67991.82 49636.84 42064.08 43658.93 34234.41 26297.28
## [1993] 30800.64 54418.25 24251.54 59217.88 69512.96 44308.29 43752.89 69433.42
```
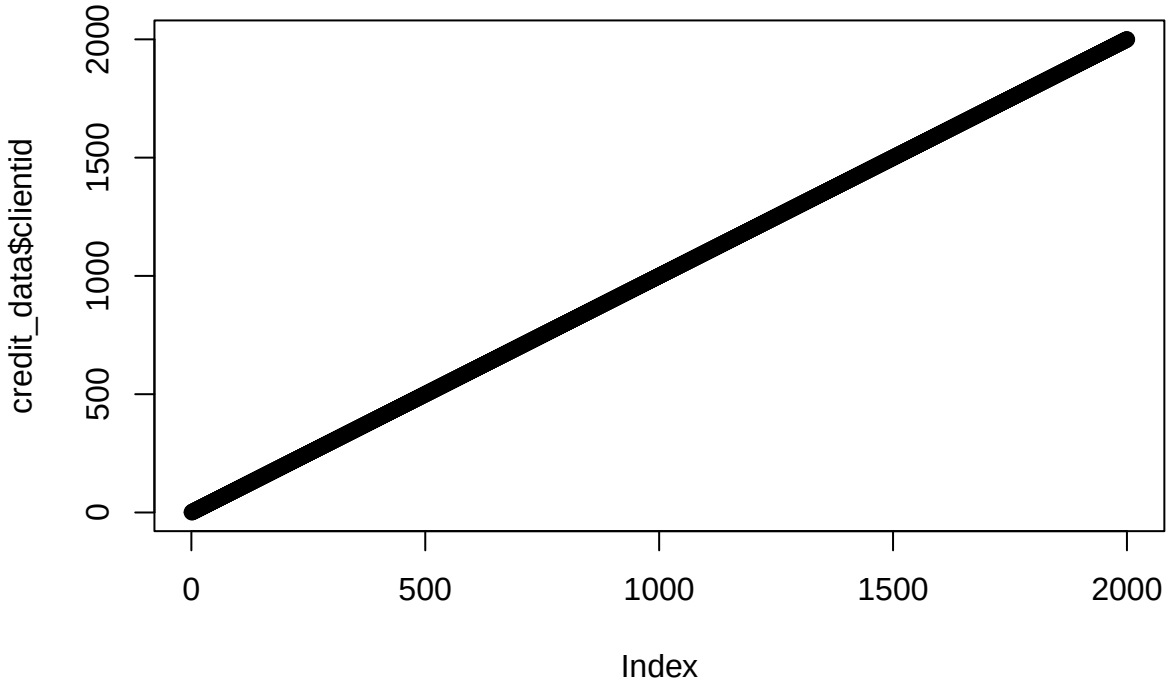
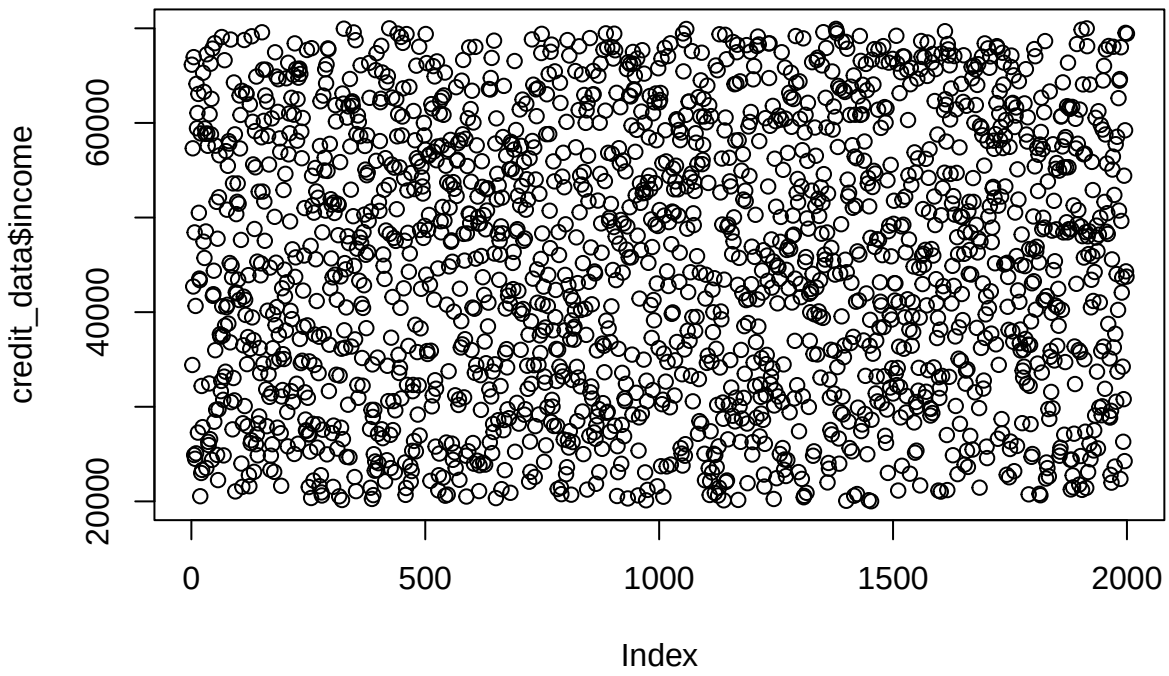

```
maxvalue <- max(credit_data $income) - max(credit_data $loan)
maxvalue
```

```
## [1] 56229.63
```

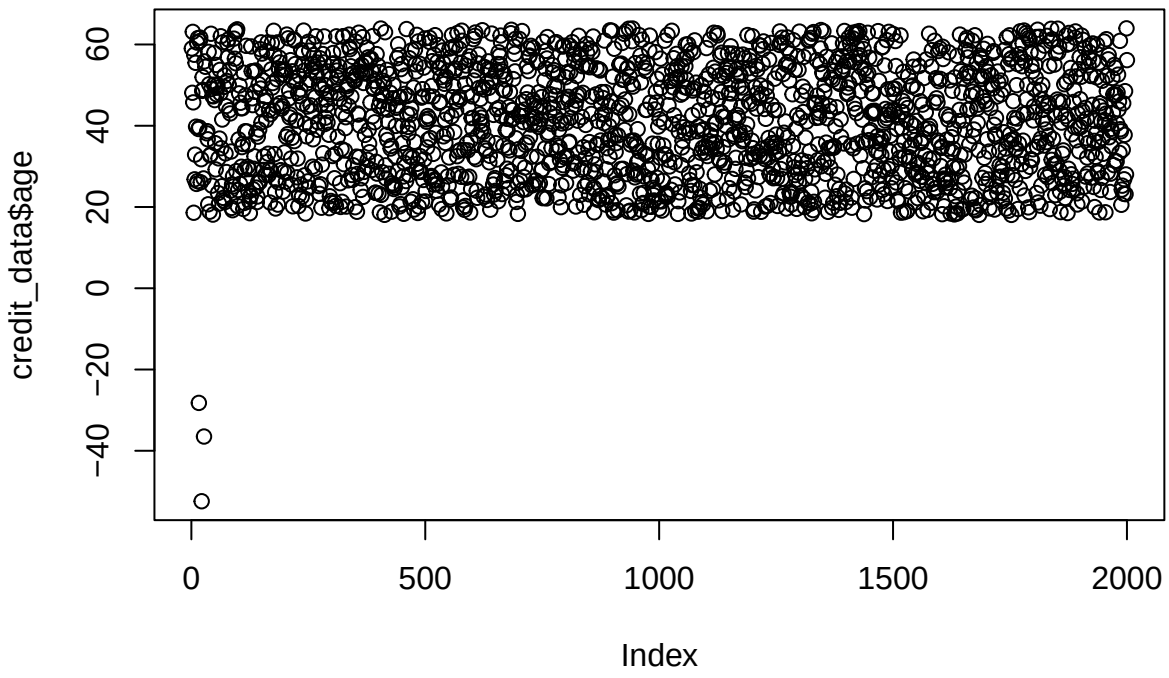
```
##Plot() function used for plotting the values of variables clientid, income, age, loan, default
plot(credit_data $clientid)
```



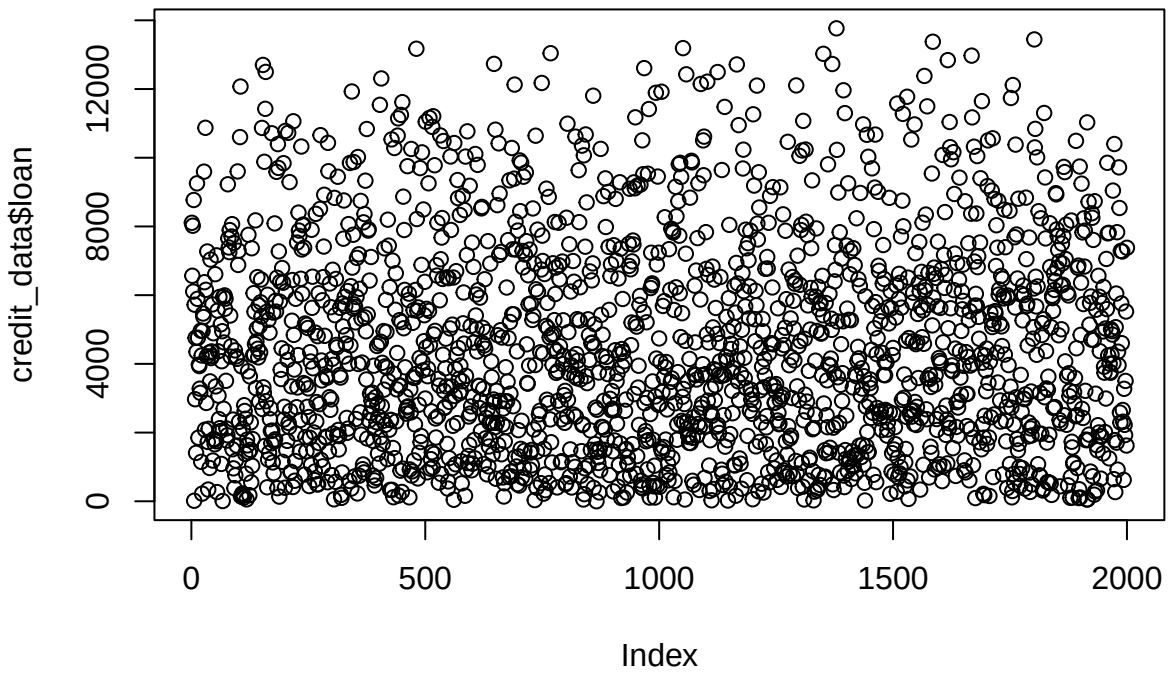

```
plot(credit_data $income)
```



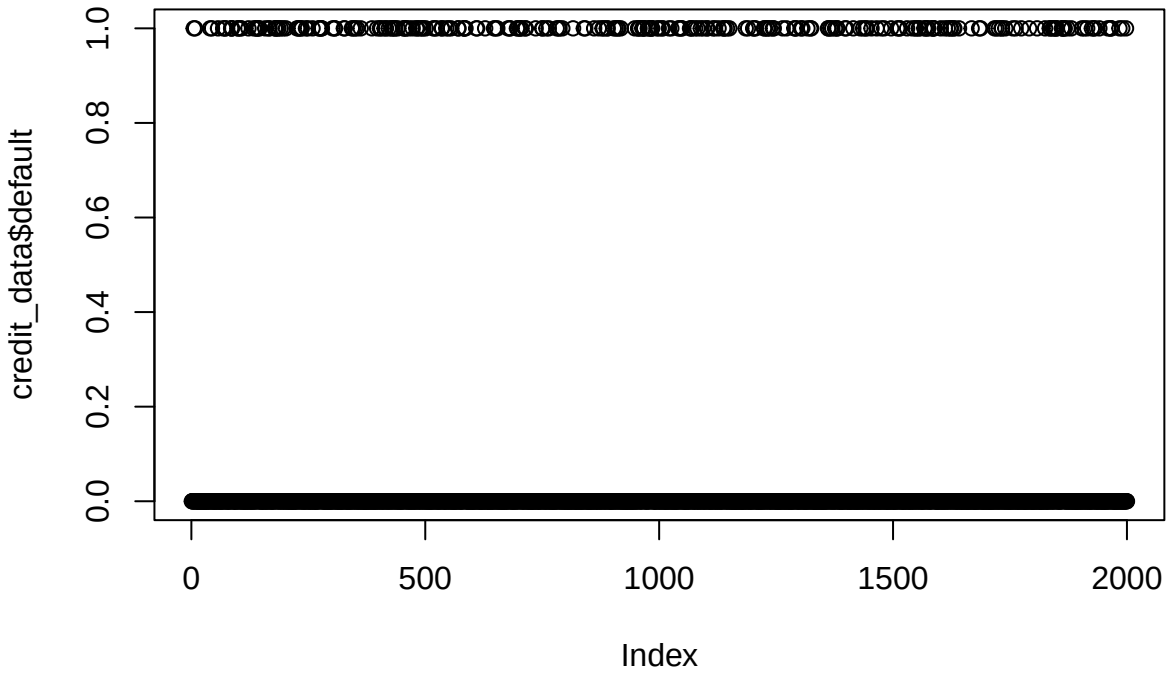

```
plot(credit_data $age)
```



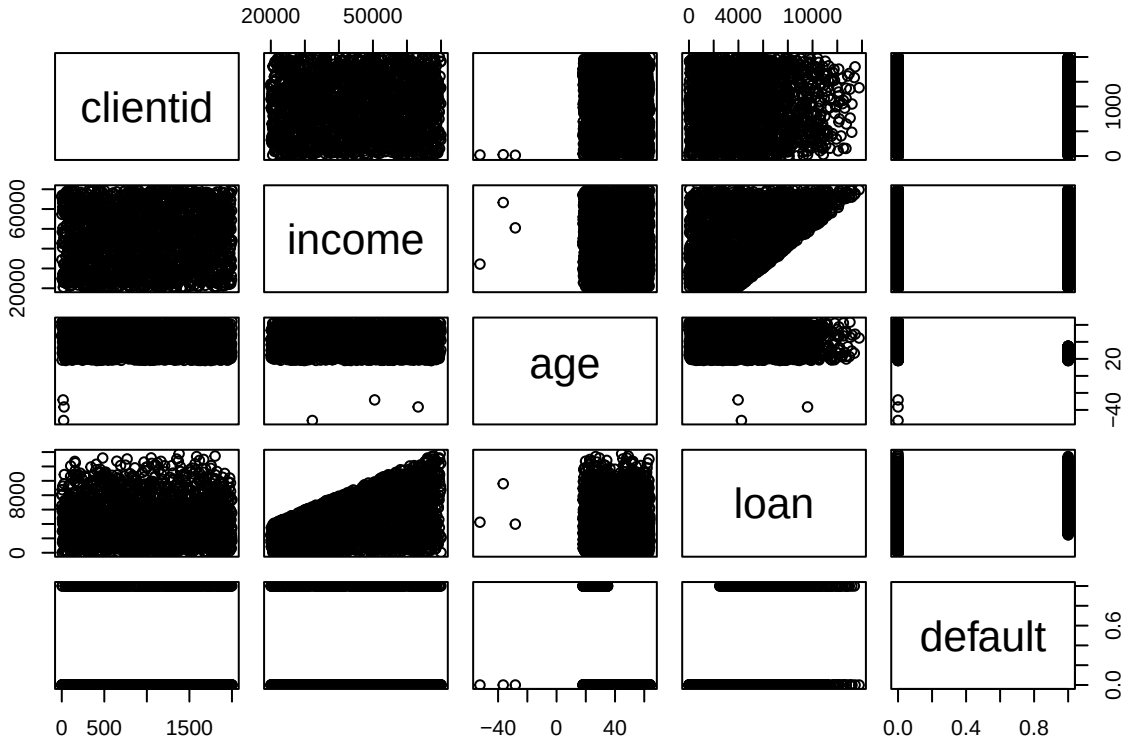

```
plot(credit_data $loan)
```



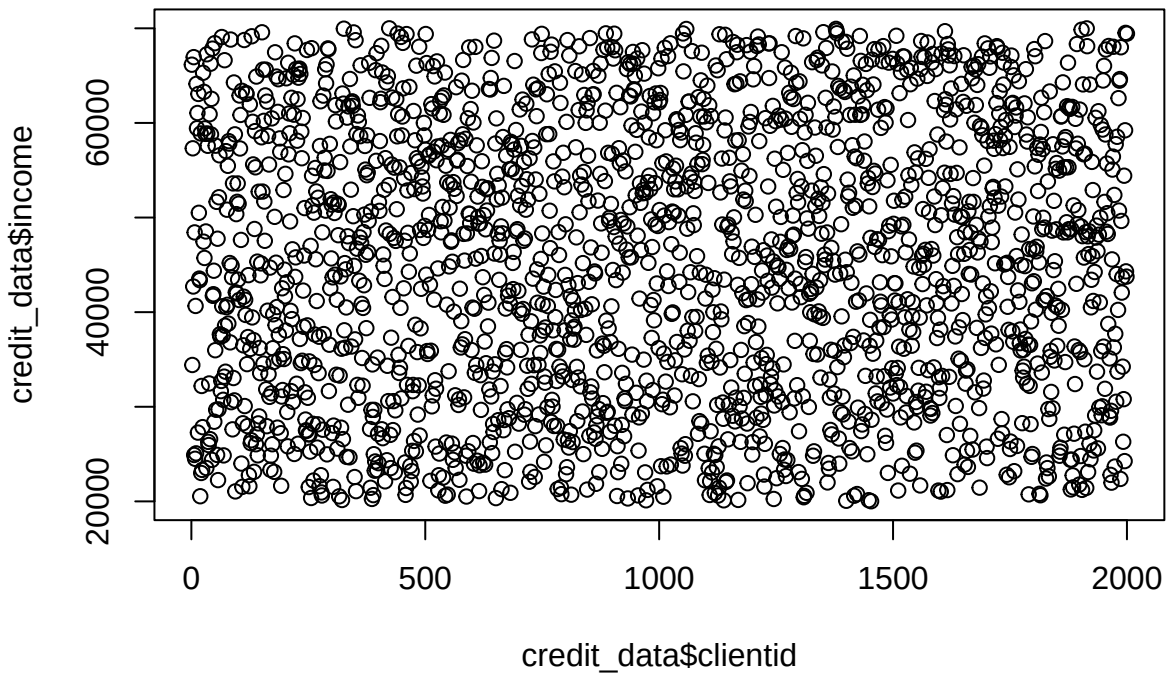

```
plot(credit_data $default)
```



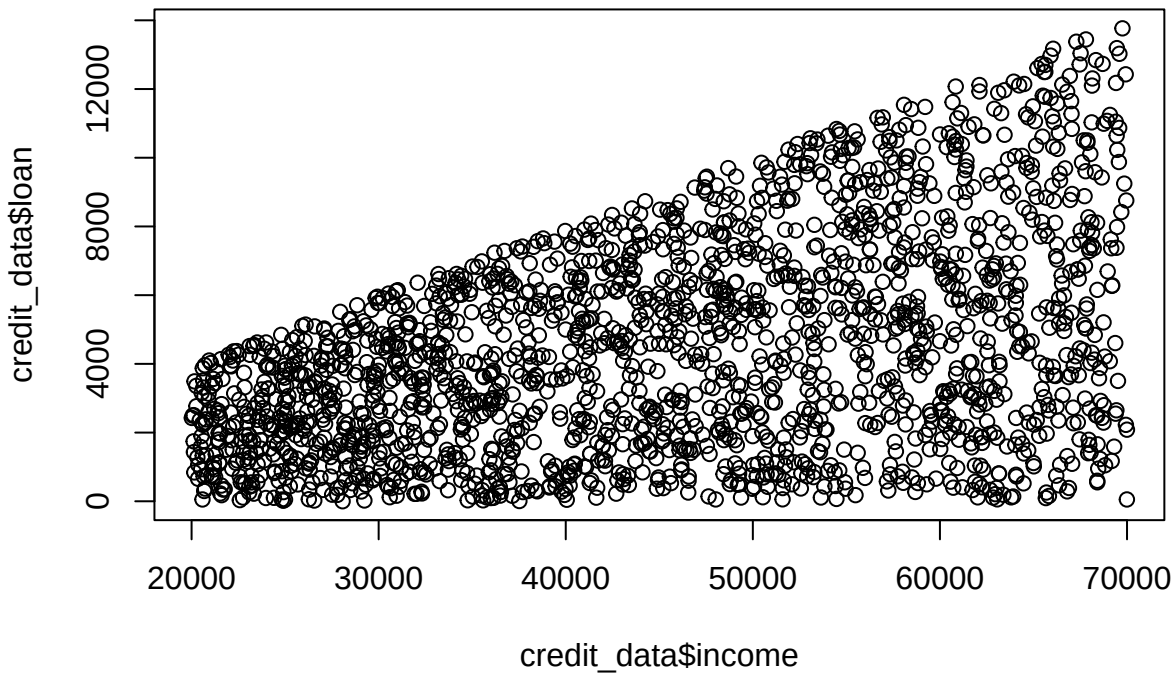

```
##Plot() function used for plotting the data set credit_data
plot(credit_data)
```




```
##plot() function can also be used for scattered plot for variables clientid, income and loan
plot(credit_data $clientid, credit_data $income)
```




```
plot(credit_data $income,credit_data $loan)
```




```
##Below libraries are used getting the output as PDF while knitting for output
library(tinytex)
library(latexpdf)
```