Survival Analysis LAB A

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```
getwd()
vet.data<-read.table("/Users/kevinlorenzoayala/desktop/vets.txt")
vet.data
```

```
#Question 1a.
vet.time<-vet.data$V1
head(vet.time)
```

```
## [1]  72 411 228 126 118  10
```

```
#Question 1b.
vet.cns<-vet.data$V2
head(vet.cns)
```

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

```
#Question 1c.
library("survival")
vet.surv<-Surv(vet.data$V1,vet.data$V2)
head(vet.surv)
```

```
## [1]  72 411 228 126 118  10
```

```
#did not use print function becuase I did not want to print all observations. Head was used instead.
```

```
#Question 1d.
vet.time.mean<-mean(vet.time)
vet.time.mean
```

```
## [1] 121.6277
```

```
#The mean of Vet.time is 121.6277, this is biased because there still exists censored data
#during this mean estimation.
```

```
#Question 1e.
sum(vet.cns)
```

```
## [1] 128
```

```
sum(vet.time*vet.cns)
```

```
## [1] 15632
```

```
#Sums are 128 and 15632 respectiveley, this means there are 128 observed values with a status
#1 and not 0. Of these observed values with a status of 1, their total time grouped
#together is 15632 becuase it is thier time multiplied by 1 then added on. The observations
#have been censored are not included because the observed time multiplied by 0 is still 0.
```

```
#Question 1f.
mean(vet.surv)
```

```
## [1] 61.28102
```

```
mean(vet.cns)
```

```
## [1] 0.9343066
```

```
# our mean is for vet.surv is 61.28, this mean has been generated by taking the average of two
#averages for vet.cns (.9343) and (121.6277) for vet.time known as a Kaplan-Meier Estimate.
```

```
#Question 2a
retire <- read.table("/Users/kevinlorenzoayala/desktop/retire.txt", header=TRUE,skip=2)
head(retire)
```

```
##   obs death ageentry age time gender
## 1 272     0      733 870  137      2
## 2  67     0      746 804   58      2
## 3  50     1      748 804   56      2
## 4 451     1      751 777   26      1
## 5 455     1      759 781   22      1
## 6 192     0      760 897  137      2
```

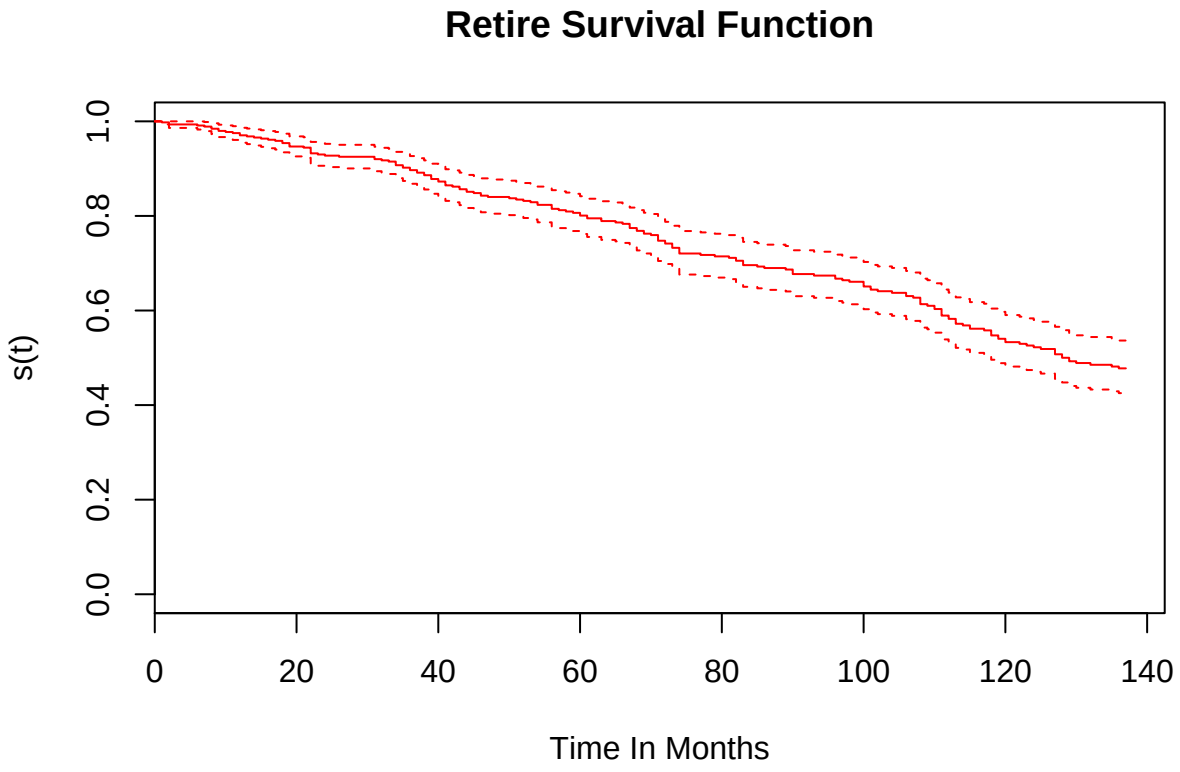
```
ret.surv<-Surv(retire$time, retire$death)
head(ret.surv)
```

```
## [1] 137+  58+  56   26   22  137+
```

```
#Question 2b
km.est<-survfit(ret.surv ~ 1)
km.est
```

```
## Call: survfit(formula = ret.surv ~ 1)
##
##       n  events  median 0.95LCL 0.95UCL
##     462     176     129     118      NA
```

```
#Question 2c
fit1<-survfit(Surv(retire$time, retire$death) ~ 1)
plot(fit1, col ="red", xlab = "Time In Months", ylab = "s(t)", main = "Retire Survival Function")
```




```
#Question 2D
summary(km.est)
```

```
## Call: survfit(formula = ret.surv ~ 1)
##
##  time n.risk n.event survival std.err lower 95% CI upper 95% CI
##     1    458       1    0.998 0.00218        0.994        1.000
##     2    457       2    0.993 0.00377        0.986        1.000
##     6    440       1    0.991 0.00439        0.983        1.000
##     7    438       1    0.989 0.00492        0.979        0.999
##     8    434       2    0.984 0.00586        0.973        0.996
##     9    427       2    0.980 0.00668        0.967        0.993
##    10    424       1    0.977 0.00705        0.964        0.991
##    11    423       1    0.975 0.00740        0.961        0.990
##    12    420       2    0.970 0.00806        0.955        0.986
##    13    415       1    0.968 0.00838        0.952        0.985
##    14    412       1    0.966 0.00868        0.949        0.983
##    15    411       1    0.963 0.00897        0.946        0.981
##    16    408       1    0.961 0.00926        0.943        0.979
##    17    406       1    0.959 0.00953        0.940        0.978
##    18    404       2    0.954 0.01006        0.934        0.974
##    19    399       3    0.947 0.01080        0.926        0.968
##    21    393       1    0.944 0.01104        0.923        0.966
##    22    392       5    0.932 0.01214        0.909        0.956
##    23    386       1    0.930 0.01235        0.906        0.954
##    24    384       1    0.928 0.01255        0.903        0.952
##    26    380       1    0.925 0.01275        0.900        0.950
##    31    367       2    0.920 0.01317        0.895        0.946
##    32    362       1    0.917 0.01338        0.892        0.944
##    33    359       1    0.915 0.01358        0.889        0.942
```

```
##    34    356       3    0.907 0.01418        0.880        0.935
##    35    351       2    0.902 0.01456        0.874        0.931
##    36    343       2    0.897 0.01494        0.868        0.927
##    37    337       2    0.891 0.01532        0.862        0.922
##    38    333       2    0.886 0.01569        0.856        0.917
##    39    330       3    0.878 0.01622        0.847        0.910
##    40    327       2    0.873 0.01656        0.841        0.906
##    41    324       3    0.865 0.01705        0.832        0.899
##    42    319       1    0.862 0.01721        0.829        0.896
##    43    317       2    0.856 0.01753        0.823        0.892
##    44    315       2    0.851 0.01784        0.817        0.887
##    45    312       1    0.848 0.01799        0.814        0.884
##    46    310       2    0.843 0.01828        0.808        0.879
##    47    307       1    0.840 0.01843        0.805        0.877
##    50    304       1    0.837 0.01857        0.802        0.875
##    51    302       1    0.835 0.01872        0.799        0.872
##    52    301       1    0.832 0.01886        0.796        0.870
##    53    298       1    0.829 0.01900        0.793        0.867
##    54    296       2    0.823 0.01928        0.786        0.862
##    56    294       3    0.815 0.01968        0.777        0.854
##    57    291       1    0.812 0.01981        0.774        0.852
##    58    287       1    0.809 0.01995        0.771        0.849
##    59    283       1    0.806 0.02008        0.768        0.847
##    60    280       2    0.801 0.02035        0.762        0.842
##    61    277       2    0.795 0.02061        0.756        0.836
##    63    273       2    0.789 0.02086        0.749        0.831
##    65    270       1    0.786 0.02099        0.746        0.828
##    66    266       1    0.783 0.02112        0.743        0.826
##    67    265       3    0.774 0.02149        0.733        0.818
##    68    261       2    0.768 0.02173        0.727        0.812
##    69    258       2    0.762 0.02197        0.721        0.807
##    70    256       1    0.760 0.02208        0.717        0.804
##    71    254       4    0.748 0.02253        0.705        0.793
##    72    250       2    0.742 0.02274        0.698        0.788
##    73    247       3    0.733 0.02305        0.689        0.779
##    74    244       4    0.721 0.02344        0.676        0.768
##    77    237       1    0.718 0.02354        0.673        0.765
##    79    235       1    0.714 0.02364        0.670        0.762
##    81    232       1    0.711 0.02374        0.666        0.759
##    82    231       2    0.705 0.02393        0.660        0.754
##    83    229       3    0.696 0.02420        0.650        0.745
##    85    226       1    0.693 0.02429        0.647        0.742
##    86    224       1    0.690 0.02438        0.644        0.739
##    89    218       1    0.687 0.02447        0.640        0.736
##    90    215       3    0.677 0.02475        0.630        0.727
##    93    210       1    0.674 0.02484        0.627        0.724
##    96    206       2    0.667 0.02502        0.620        0.718
##    97    204       1    0.664 0.02511        0.617        0.715
##    98    203       1    0.661 0.02520        0.613        0.712
##   100    199       3    0.651 0.02547        0.603        0.703
##   101    195       2    0.644 0.02564        0.596        0.696
##   102    193       1    0.641 0.02572        0.592        0.693
##   104    189       1    0.637 0.02581        0.589        0.690
##   106    186       2    0.631 0.02598        0.582        0.684
```

```
##    107     184       1    0.627 0.02607        0.578        0.680
##    108     183       4    0.613 0.02638        0.564        0.667
##    109     179       1    0.610 0.02646        0.560        0.664
##    110     178       2    0.603 0.02660        0.553        0.658
##    111     174       4    0.589 0.02688        0.539        0.644
##    112     170       2    0.582 0.02700        0.532        0.638
##    113     168       3    0.572 0.02718        0.521        0.628
##    114     165       1    0.568 0.02724        0.518        0.624
##    115     164       2    0.562 0.02734        0.510        0.618
##    117     159       1    0.558 0.02740        0.507        0.614
##    118     157       3    0.547 0.02756        0.496        0.604
##    119     154       2    0.540 0.02765        0.489        0.597
##    120     152       2    0.533 0.02774        0.481        0.590
##    122     149       1    0.530 0.02779        0.478        0.587
##    123     147       1    0.526 0.02783        0.474        0.583
##    124     143       1    0.522 0.02788        0.470        0.580
##    125     142       1    0.519 0.02792        0.467        0.576
##    127     140       3    0.507 0.02805        0.455        0.566
##    128     137       2    0.500 0.02813        0.448        0.558
##    129     135       2    0.493 0.02819        0.440        0.551
##    130     133       1    0.489 0.02822        0.437        0.548
##    132     132       1    0.485 0.02825        0.433        0.544
##    135     129       1    0.481 0.02828        0.429        0.540
##    136     126       1    0.478 0.02832        0.425        0.537
```

```
#This summary tells us that at 50 months, the rate of surviving is 0.837, at 51 months the
#survival rate drops to .835 and continues to do so till 136 months at a rate of .478
```