extract_min.R

Preston

2020-05-23

```
# Preston Dunton
# CS320 Honors Option
# May 20, 2020
# pdunton@rams.colostate.edu

# Extract_Min() Should be O(logn)

extract_min_binomial = read.csv("./extract_min_binomial.csv")
attach(extract_min_binomial)
```

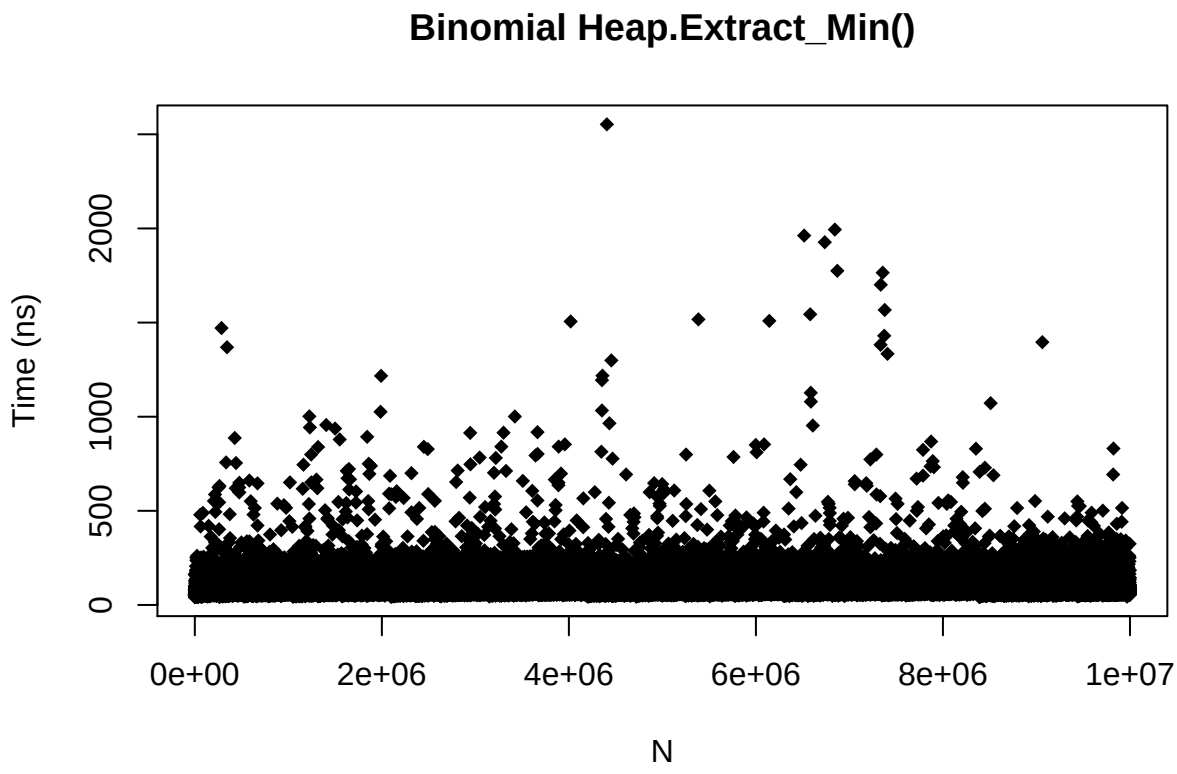
```
## The following object is masked from package:base:
##
##     T
```

```
summary(T)
```

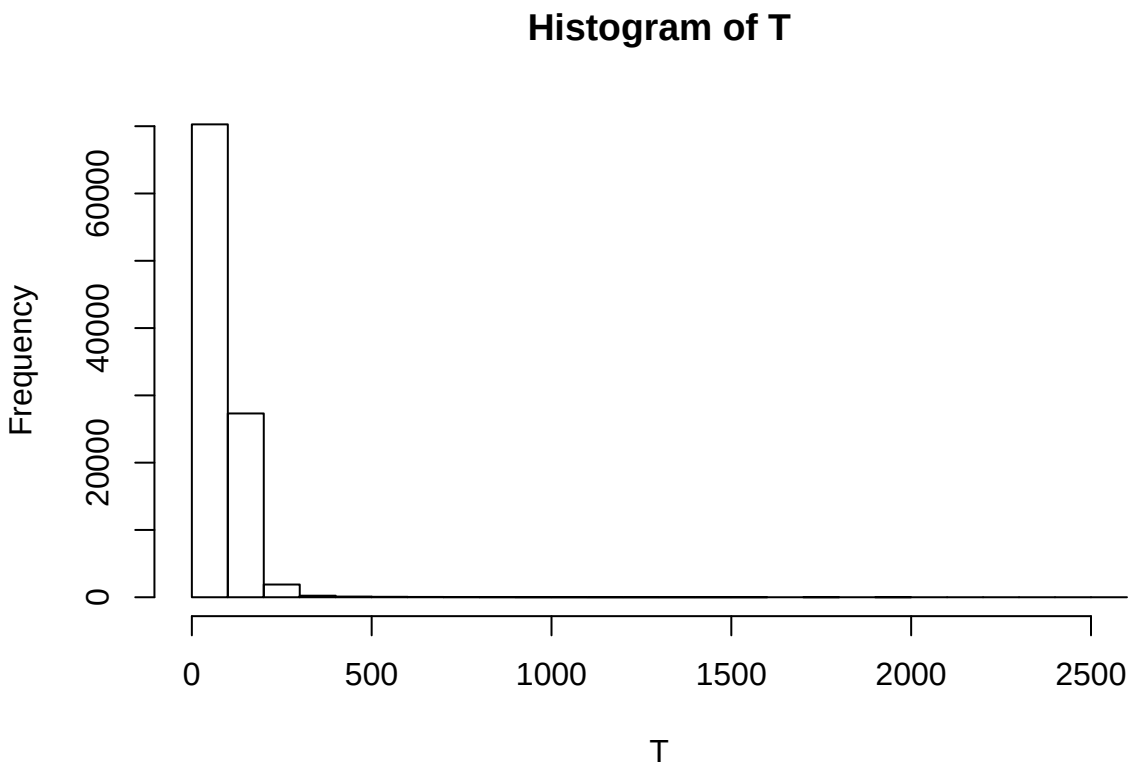
```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    41.0    71.0    84.0    96.5   107.0  2553.0
```

```
# min 41
# q1 71
# median 84
# mean 96.5
# q3 107
# max 2553

plot(N,T,pch=18,xlab="N",ylab="Time (ns)",main="Binomial Heap.Extract_Min()")
```




```
hist(T,breaks=20)
```




```
# Let's see if we can remove some outliers

quantile(T,seq(0,1,0.1))
```

```
##   0%  10%  20%  30%  40%  50%  60%  70%  80%  90% 100%
##   41   63   69   74   79   84   91  100  116  142 2553
```

```
quantile(T,seq(0.9,1,0.01))
```

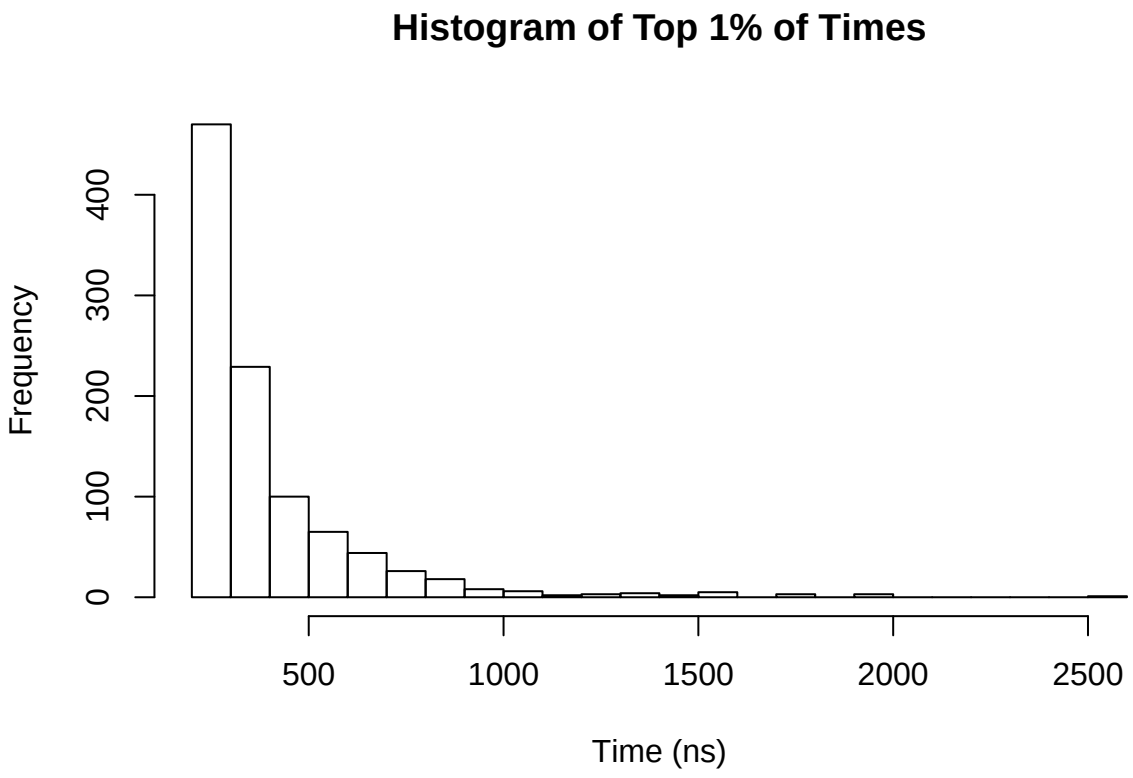
```
##  90%  91%  92%  93%  94%  95%  96%  97%  98%  99% 100%
##  142  145  150  155  161  169  179  191  209  247 2553
```

```
# Let's separate the top 1% and analyze

# Top 1%
  summary(T[which(T>247)])
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   248.0   269.0   306.0   401.7   441.0  2553.0
```

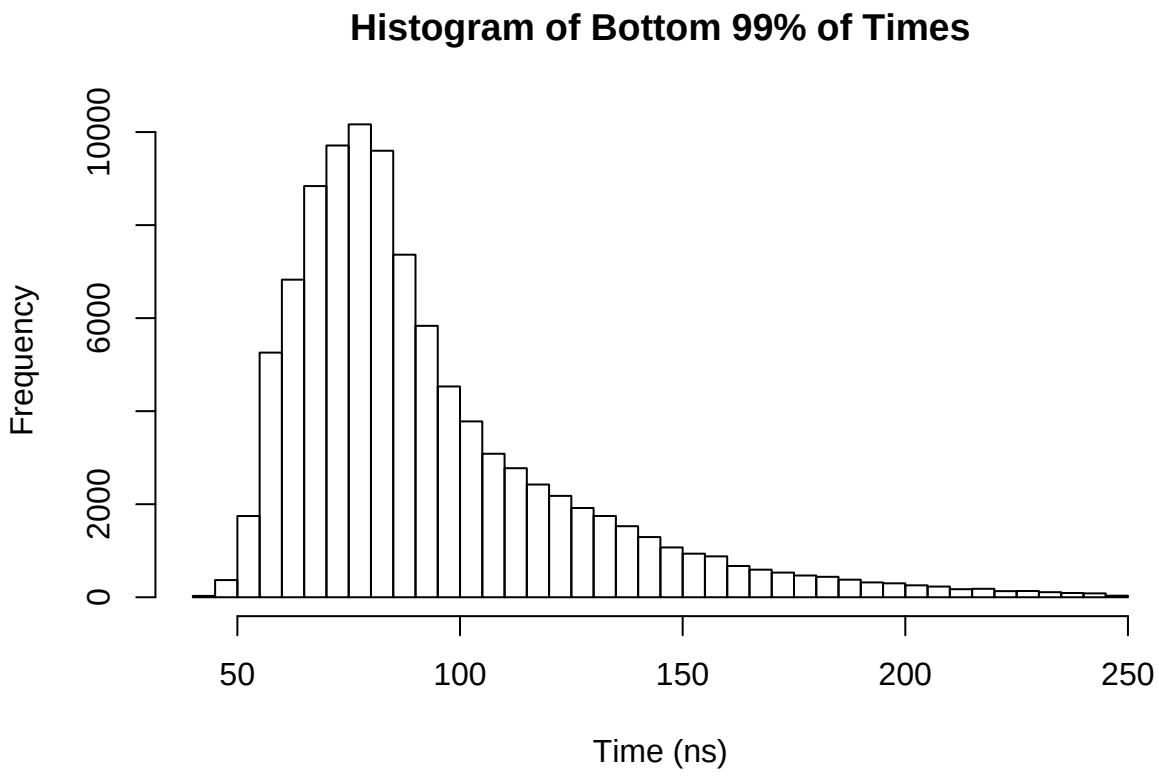
```
  # min 248
  # q1 269
  # median 306
  # mean 401.7
  # q3 441
  # max 2553
  hist(T[which(T>247)],main="Histogram of Top 1% of Times",xlab="Time (ns)",breaks=20)
```




```
# Bottom 99%
  summary(T[which(T<=247)])
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   41.00   71.00   84.00   93.45  106.00  247.00
```

```
  # min 41
  # q1 71
  # median 84
  # mean 93.45
  # q3 106
  # max 247
  hist(T[which(T<=247)],main="Histogram of Bottom 99% of Times",xlab="Time (ns)",breaks=30)
```




```
detach(extract_min_binomial)
```