Problem 1: James 2.4, Exercise 8

Part a

```
> college <- read.csv(file="datasets/College.csv")
> head(college)
                             X Private Apps Accept Enroll Top10perc Top25perc F.Undergrad P.Undergrad Outstate Room.Board Books
1 Abilene Christian University     Yes 1660   1232    721        23        52        2885         537     7440       3300   450
2            Adelphi University     Yes 2186   1924    512        16        29        2683        1227    12280       6450   750
3               Adrian College     Yes 1428   1097    336        22        50        1036          99    11250       3750   400
4           Agnes Scott College     Yes  417    349    137        60        89         510          63    12960       5450   450
5       Alaska Pacific University     Yes  193    146     55        16        44         249         869     7560       4120   800
6             Albertson College     Yes  587    479    158        38        62         678          41    13500       3335   500
  Personal PhD Terminal S.F.Ratio perc.alumni Expend Grad.Rate
1     2200  70       78      18.1          12   7041        60
2     1500  29       30      12.2          16  10527        56
3     1165  53       66      12.9          30   8735        54
4      875  92       97       7.7          37  19016        59
5     1500  76       72      11.9           2  10922        15
6      675  67       73       9.4          11   9727        55
```

Part b

	row.names	Private	Apps	Accept	Enroll	Top10perc	Top25perc
1	Abilene Christian University	Yes	1660	1232	721	23	52
2	Adelphi University	Yes	2186	1924	512	16	29
3	Adrian College	Yes	1428	1097	336	22	50
4	Agnes Scott College	Yes	417	349	137	60	89
5	Alaska Pacific University	Yes	193	146	55	16	44
6	Albertson College	Yes	587	479	158	38	62
7	Albertus Magnus College	Yes	353	340	103	17	45
8	Albion College	Yes	1899	1720	489	37	68
9	Albright College	Yes	1038	839	227	30	63
10	Alderson-Broaddus College	Yes	582	498	172	21	44

Part c

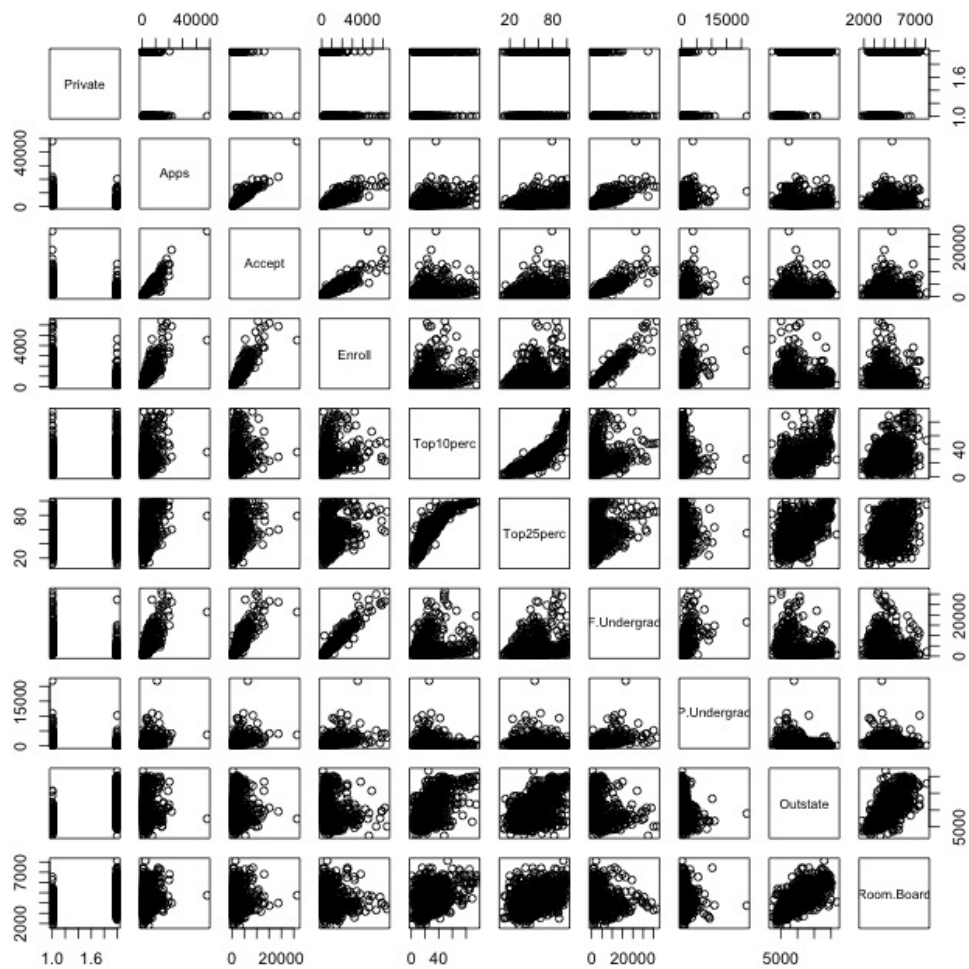## Part i

```
> summary(college)
 Private        Apps           Accept          Enroll       Top10perc       Top25perc      F.Undergrad      P.Undergrad        Outstate
 No :212   Min.   :   81   Min.   :   72   Min.   :  35   Min.   :  1.00   Min.   :  9.0   Min.   :  139   Min.   :    1.0   Min.   : 2340
 Yes:565   1st Qu.:  776   1st Qu.:  604   1st Qu.: 242   1st Qu.:15.00   1st Qu.: 41.0   1st Qu.:  992   1st Qu.:   95.0   1st Qu.: 7320
           Median : 1558   Median : 1110   Median : 434   Median :23.00   Median : 54.0   Median : 1707   Median :  353.0   Median : 9990
           Mean   : 3002   Mean   : 2019   Mean   : 780   Mean   :27.56   Mean   : 55.8   Mean   : 3700   Mean   :  855.3   Mean   :10441
           3rd Qu.: 3624   3rd Qu.: 2424   3rd Qu.: 902   3rd Qu.:35.00   3rd Qu.: 69.0   3rd Qu.: 4005   3rd Qu.:  967.0   3rd Qu.:12925
           Max.   :48094   Max.   :26330   Max.   :6392   Max.   :96.00   Max.   :100.0   Max.   :31643   Max.   :21836.0   Max.   :21700
   Room.Board        Books          Personal          PhD           Terminal        S.F.Ratio      perc.alumni        Expend         Grad.Rate
 Min.   :1780   Min.   :  96.0   Min.   : 250   Min.   :  8.00   Min.   : 24.0   Min.   : 2.50   Min.   : 0.00   Min.   : 3186   Min.   : 10.00
 1st Qu.:3597   1st Qu.: 470.0   1st Qu.: 850   1st Qu.: 62.00   1st Qu.: 71.0   1st Qu.:11.50   1st Qu.:13.00   1st Qu.: 6751   1st Qu.: 53.00
 Median :4200   Median : 500.0   Median :1200   Median : 75.00   Median : 82.0   Median :13.60   Median :21.00   Median : 8377   Median : 65.00
 Mean   :4358   Mean   : 549.4   Mean   :1341   Mean   : 72.66   Mean   : 79.7   Mean   :14.09   Mean   :22.74   Mean   : 9660   Mean   : 65.46
 3rd Qu.:5050   3rd Qu.: 600.0   3rd Qu.:1700   3rd Qu.: 85.00   3rd Qu.: 92.0   3rd Qu.:16.50   3rd Qu.:31.00   3rd Qu.:10830   3rd Qu.: 78.00
 Max.   :8124   Max.   :2340.0   Max.   :6800   Max.   :103.00   Max.   :100.0   Max.   :39.80   Max.   :64.00   Max.   :56233   Max.   :118.00
```
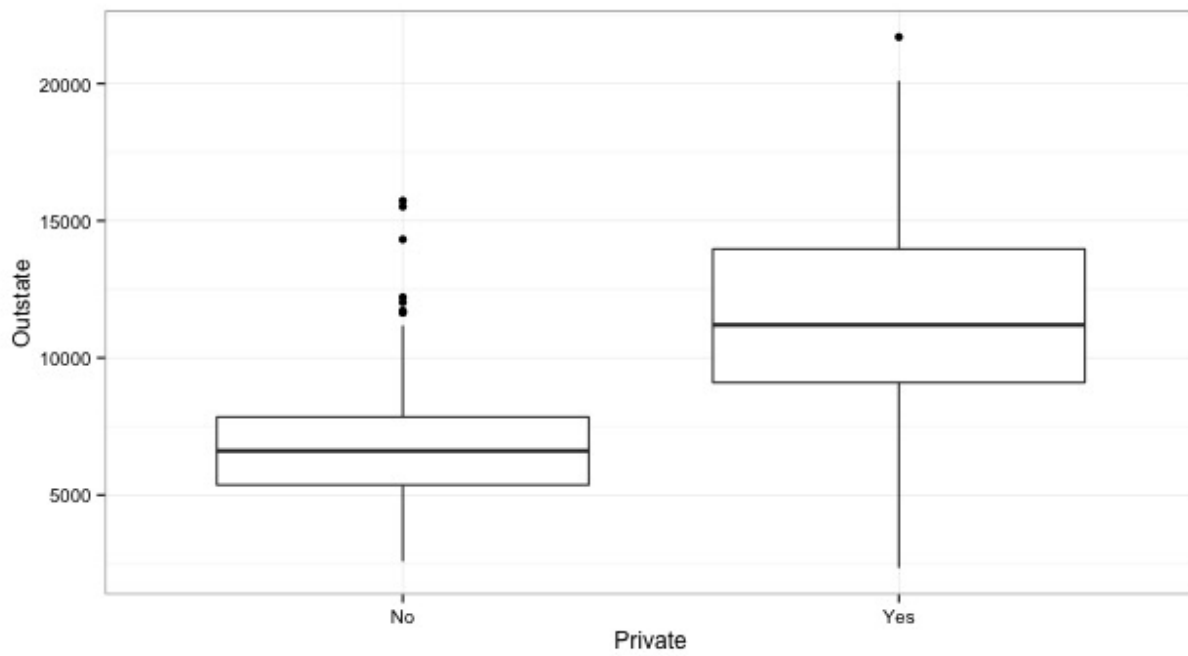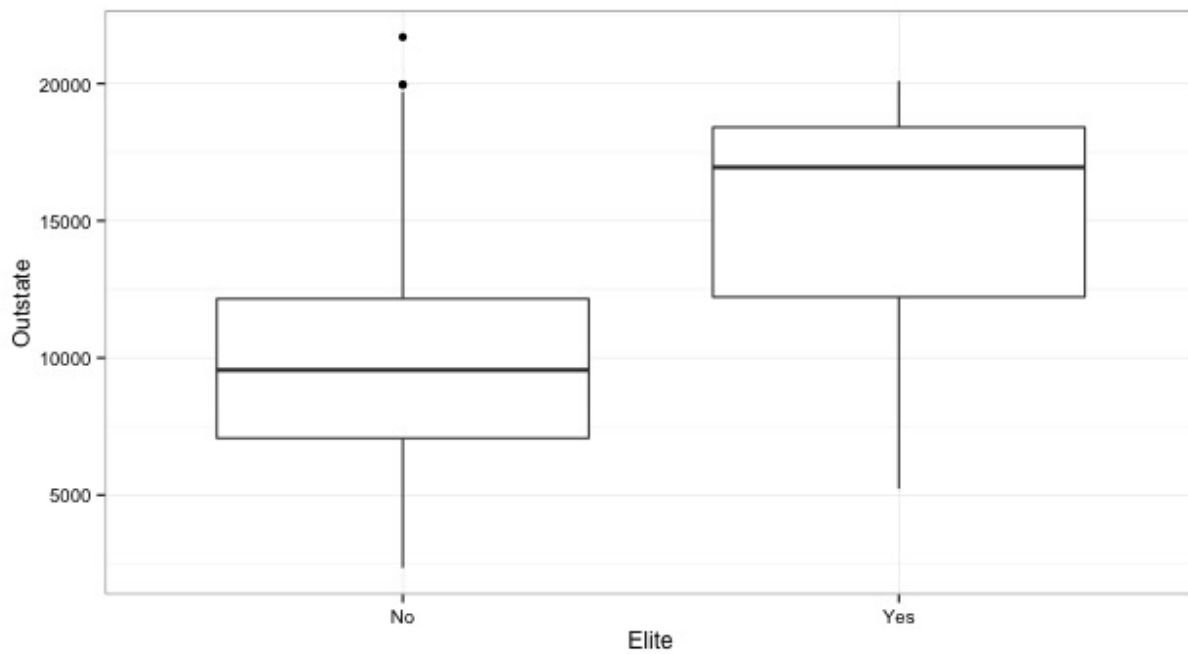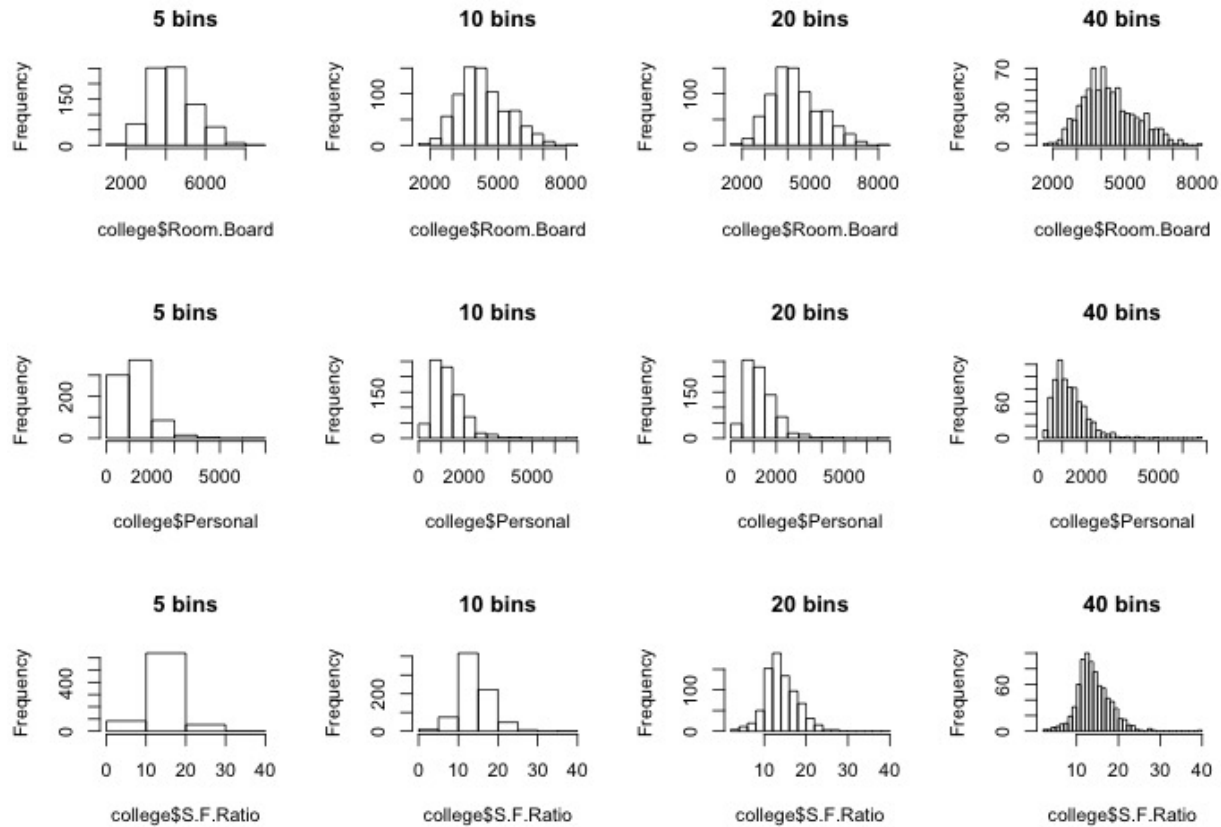
Part ii

Part iii

Part iv

There are 78 colleges categorized as "Elite".

Part v

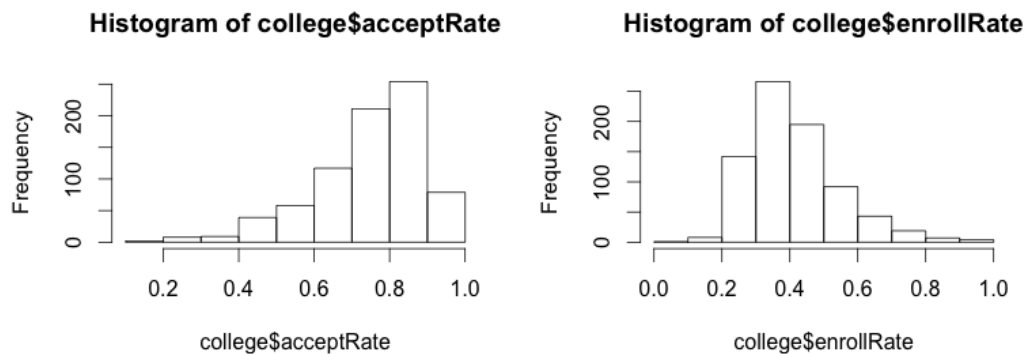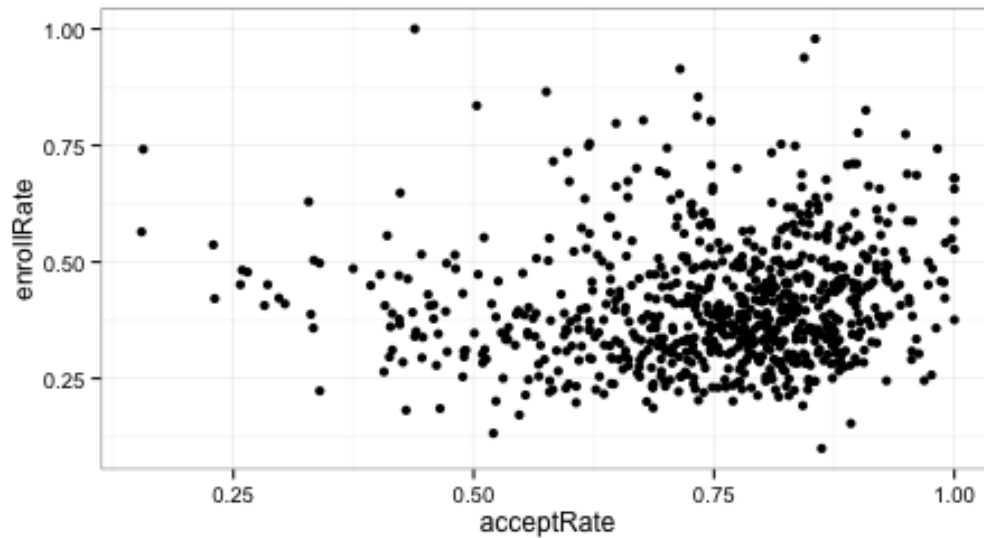**Part vi**

I chose to explore acceptance and enrollment rates, with acceptance rate defined as the number of students accepted per application received (`college$Accept/college$Apps`), and enrollment rate defined as the number of students enrolled per applicant accepted (`college$Enroll/college$Accept`).

Somewhat surprisingly, there's little correlation between acceptance and enrollment rate.

```
> cor(college$acceptRate, college$enrollRate)
[1] 0.0824304
```


I also looked at summary statistics by public vs private schools.

```
> college %>%
+   group_by(Private) %>%
+   summarize(min.acceptRate=min(acceptRate),
+             median.acceptRate=median(acceptRate),
+             mean.acceptRate=mean(acceptRate),
+             max.acceptRate=max(acceptRate),
+             min.enrollRate=min(enrollRate),
+             median.enrollRate=median(enrollRate),
+             mean.enrollRate=mean(enrollRate),
+             max.enrollRate=max(enrollRate)) %>%
+   as.data.frame()
```

	Private	min.acceptRate	median.acceptRate	mean.acceptRate	max.acceptRate	min.enrollRate
1	No	0.3397060	0.7443387	0.7265305	1	0.13242009
2	Yes	0.1544863	0.7885653	0.7545812	1	0.09975397

	median.enrollRate	mean.enrollRate	max.enrollRate
1	0.4405908	0.4620216	0.9382716
2	0.3660934	0.3932510	1.0000000