R Summarize a Quantitative/Continuous Variable with Categorical Groups

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Generate Test Score Dataset

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- r generate text string as csv
- r tibble matrix hand input

First, we will generate a test score dataset, directly from string. Below we type line by line a dataset with four variables in comma separated (csv) format, where the first row includes the variables names. These texts could be stored in a separate file, or they could be directly included in code and read in as csv

```
ar_test_scores_ec3 <- c(107.72,101.28,105.92,109.31,104.27,110.27,91.92846154,81.8,109.0071429,103.07,9
ar_test_scores_ec1 <- c(101.72,101.28,99.92,103.31,100.27,104.27,90.23615385,77.8,103.4357143,97.07,93.
mt_test_scores <- cbind(ar_test_scores_ec1, ar_test_scores_ec3)
ar_st_varnames <- c('course_total_ec1p','course_total_ec3p')
tb_final_twovar <- as_tibble(mt_test_scores) %>% rename_all(~c(ar_st_varnames))
summary(tb_final_twovar)
```

A Dataset with only Two Continuous Variable

```
##  course_total_ec1p course_total_ec3p
##  Min.   : 40.48    Min.   : 44.23
##  1st Qu.: 76.46    1st Qu.: 79.91
##  Median : 86.35    Median : 89.28
##  Mean   : 83.88    Mean   : 87.90
##  3rd Qu.: 95.89    3rd Qu.:100.75
##  Max.   :104.27    Max.   :112.22
```

```
ff_summ_percentiles(df = tb_final_twovar, bl_statsasrows = TRUE, col2varname = FALSE)
```

```
## # A tibble: 17 x 3
##    stats   course.total.ec1p course.total.ec3p
##    <chr>   <chr>             <chr>
##  1 n       46                46
##  2 NAobs   0                 0
##  3 ZEROobs 0                 0
##  4 mean    83.87572         87.90239
##  5 sd      15.87272         16.76041
##  6 cv      0.1892409        0.1906706
##  7 min     40.475           44.225
##  8 p01     42.14434         45.82202
##  9 p05     56.9650          57.1575
## 10 p10     63.05462         66.07500
## 11 p25     76.45616         79.90500
## 12 p50     86.35236         89.27923
## 13 p75     " 95.89054"      100.75250
## 14 p90     100.8137         106.8200
## 15 p95     102.9125         109.2343
## 16 p99     103.8946         111.3439
## 17 max     104.2700         112.2225
```

```
ar_final_scores <- c(94.28442509,95.68817475,97.25219512,77.89268293,95.08795497,93.27380863,92.3,84.253
mt_test_scores <- cbind(seq(1,length(ar_final_scores)), ar_final_scores)
ar_st_varnames <- c('index', 'course_final')
tb_onevar <- as_tibble(mt_test_scores) %>% rename_all(~c(ar_st_varnames))
summary(tb_onevar)
```

A Dataset with one Continuous Variable and Histogram

```
##      index       course_final
##  Min.   : 1.0   Min.   :  2.293
##  1st Qu.:12.5   1st Qu.: 76.372
##  Median :24.0   Median : 86.959
##  Mean   :24.0   Mean   : 82.415
##  3rd Qu.:35.5   3rd Qu.: 94.686
##  Max.   :47.0   Max.   :100.898
```

```
ff_summ_percentiles(df = tb_onevar, bl_statsasrows = TRUE, col2varname = FALSE)
```

```
## # A tibble: 17 x 3
##    stats   course.final index
##    <chr>   <chr>        <chr>
##  1 n       47           47
##  2 NAobs   0            0
##  3 ZEROobs 0            0
##  4 mean    82.41501     24.00000
##  5 sd      18.35476     13.71131
##  6 cv      0.2227113    0.5713046
##  7 min     2.292683     1.000000
##  8 p01     18.67401     " 1.46000"
##  9 p05     49.72075     " 3.30000"
## 10 p10     66.28051     " 5.60000"
## 11 p25     76.37177     12.50000
## 12 p50     86.95932     24.00000
## 13 p75     94.68619     35.50000
## 14 p90     97.52332     42.40000
## 15 p95     99.47459     44.70000
## 16 p99     100.5244     " 46.5400"
## 17 max     100.898      " 47.000"
```

```
#load in data empirically by hand
txt_test_data <- "init_prof, later_prof, class_id, exam_score
 'SW', 'SW', 1, 102
 'SW', 'SW', 1, 102
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 'SW', 'SW', 1, 100
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 'SW', 'SW', 1, 95
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 'MP', 'MP', 2, 102
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 'MP', 'MP', 2, 100
```

```
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'CA', 'MP', 3, 78
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```

```
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'CA', 'SN', 4, 51
'CA', 'SN', 4, 50.5
'CA', 'SN', 4, 50
'CA', 'SN', 4, 49
'CA', 'SN', 4, 43
'CA', 'SN', 4, 39.5
'CA', 'SN', 4, 32.5
'CA', 'SN', 4, 25.5
```
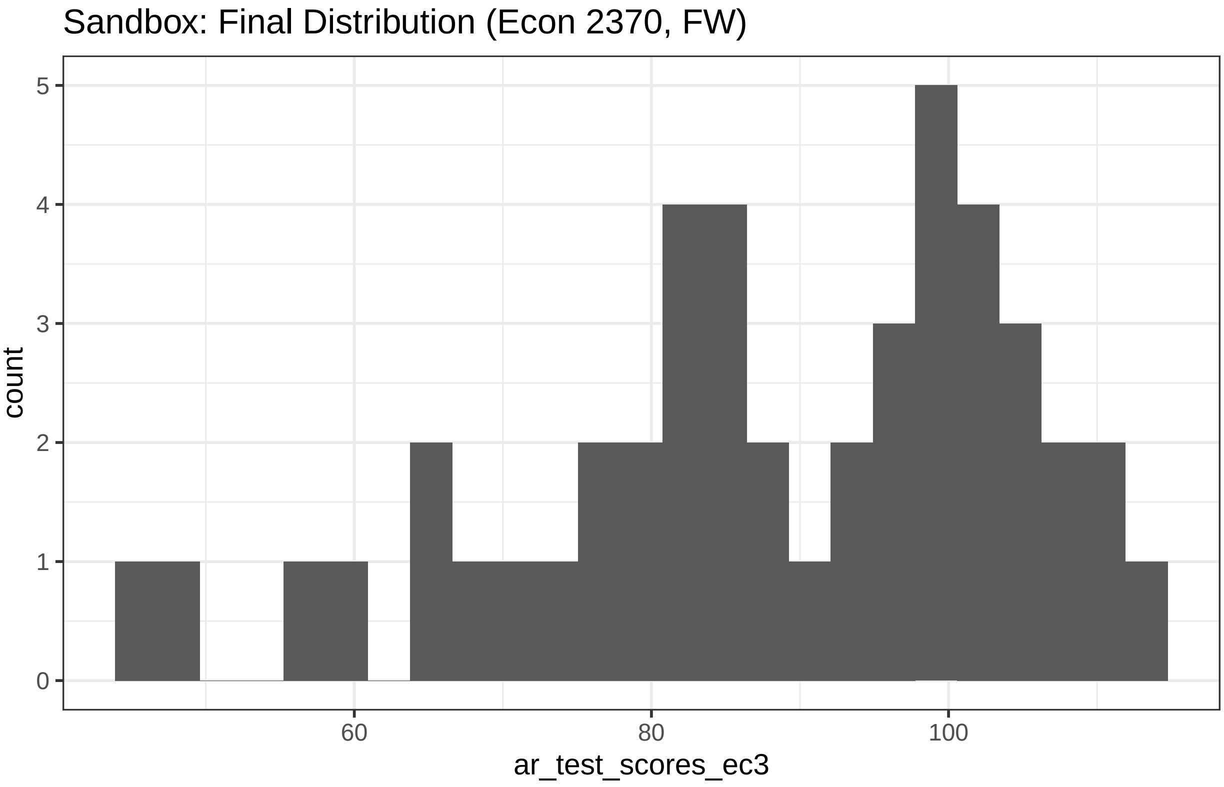

```
 'CA', 'SN', 4, 18"

csv_test_data = read.csv(text=txt_test_data, header=TRUE)
ar_st_varnames <- c('first_half_professor', 'second_half_professor', 'course_id', 'exam_score')
tb_test_data <- as_tibble(csv_test_data) %>% rename_all(~c(ar_st_varnames))
summary(tb_test_data)
```

A Dataset with Multiple Variables

```
##  first_half_professor second_half_professor   course_id       exam_score
##   'CA':72              'MP':70               Min.   :1.000   Min.   :  4.00
##   'MP':42              'SN':44               1st Qu.:1.000   1st Qu.: 60.00
##   'SW':43              'SW':43               Median :2.000   Median : 82.00
##                                              Mean   :2.465   Mean   : 75.08
##                                              3rd Qu.:4.000   3rd Qu.: 94.00
##                                              Max.   :4.000   Max.   :105.00
```

Test Score Distributions

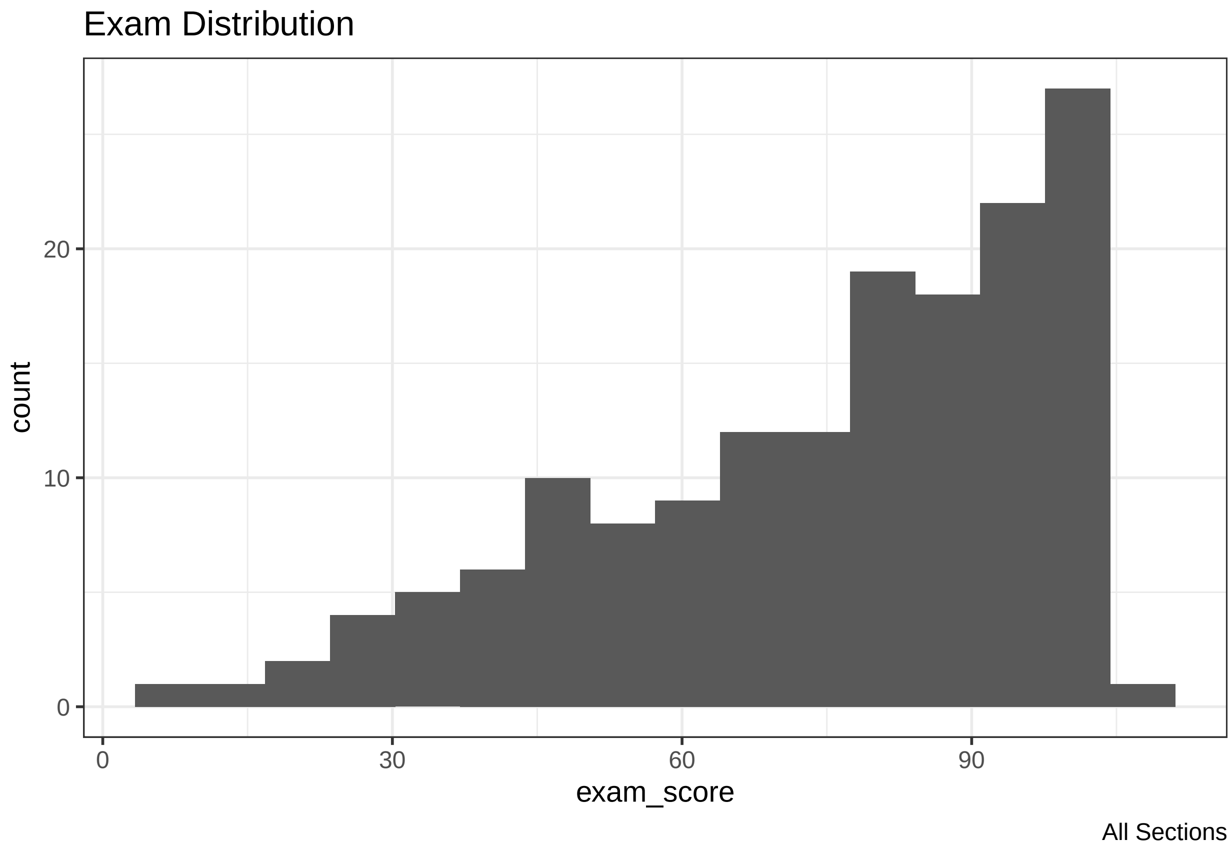
```
ggplot(tb_final_twovar, aes(x=ar_test_scores_ec3)) +
  geom_histogram(bins=25) +
  labs(title = paste0('Sandbox: Final Distribution (Econ 2370, FW)'),
       caption = 'FW Section, formula: 0.3*exam1Perc + 0.3*exam2Perc + 0.42*HWtotalPerc + 0.03*Attendan
  theme_bw()
```



FW Section, formula: 0.3*exam1Perc + 0.3*exam2Perc + 0.42*HWtotalPerc + 0.03*AttendancePerc
+ perfect attendance + 0.03 per Extra Credit

Histogram

```r
ggplot(tb_test_data, aes(x=exam_score)) +
  geom_histogram(bins=16) +
  labs(title = paste0('Exam Distribution'),
       caption = 'All Sections') +
  theme_bw()
```


Exam Distribution
count
exam_score
All Sections