

Sleep deprivation

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```
sleep <- read.csv("~/Projects/SleepDeprivation/experience.csv", sep=",")
attach(sleep)
```

Five constructs are taken into considerations to define pre-existing differences between subjects experience with:

- Software development in general (DEV)
- Test-driven developmet (TDD)
- The Java programming language (OOP)
- unit testing (UT)
- the Eclipse IDE (IDE)

for each of the four above (i.e., excluding TDD), we asked the subjects to evaluate:

1. general familiarity (5-points likert item: *very experienced* – *very inexperienced*)
2. years used in academia (numerical integer)
3. years used in industry (numerical integer)
4. years used in own activities (numerical integer)

Whereas we only have 1) regarding TDD.

The alpha level is 0.0125 due to Bonferroni correction (i.e., taking into account the four measure above)

Analysis of the entire dataset (n = 45)

The analysis reported below consider the dataset before data cleaning (i.e., removing unexpected PVT scores).

Software development in general

```
pander(table(GROUP, DEV_GENERAL))
```

| | Experienced | Inexperienced | Neither experienced nor inexperienced | Very experienced |
|-----------|-------------|---------------|--|------------------|
| RS | 3 | 1 | 16 | 2 |
| SD | 2 | 1 | 20 | 0 |

There appear to be roughly the same number of subjects in all the levels (*very experienced* has no subjects in both groups, therefore it is not reported).

```
pander(kruskal.test(DEV_GENERAL~GROUP))
```

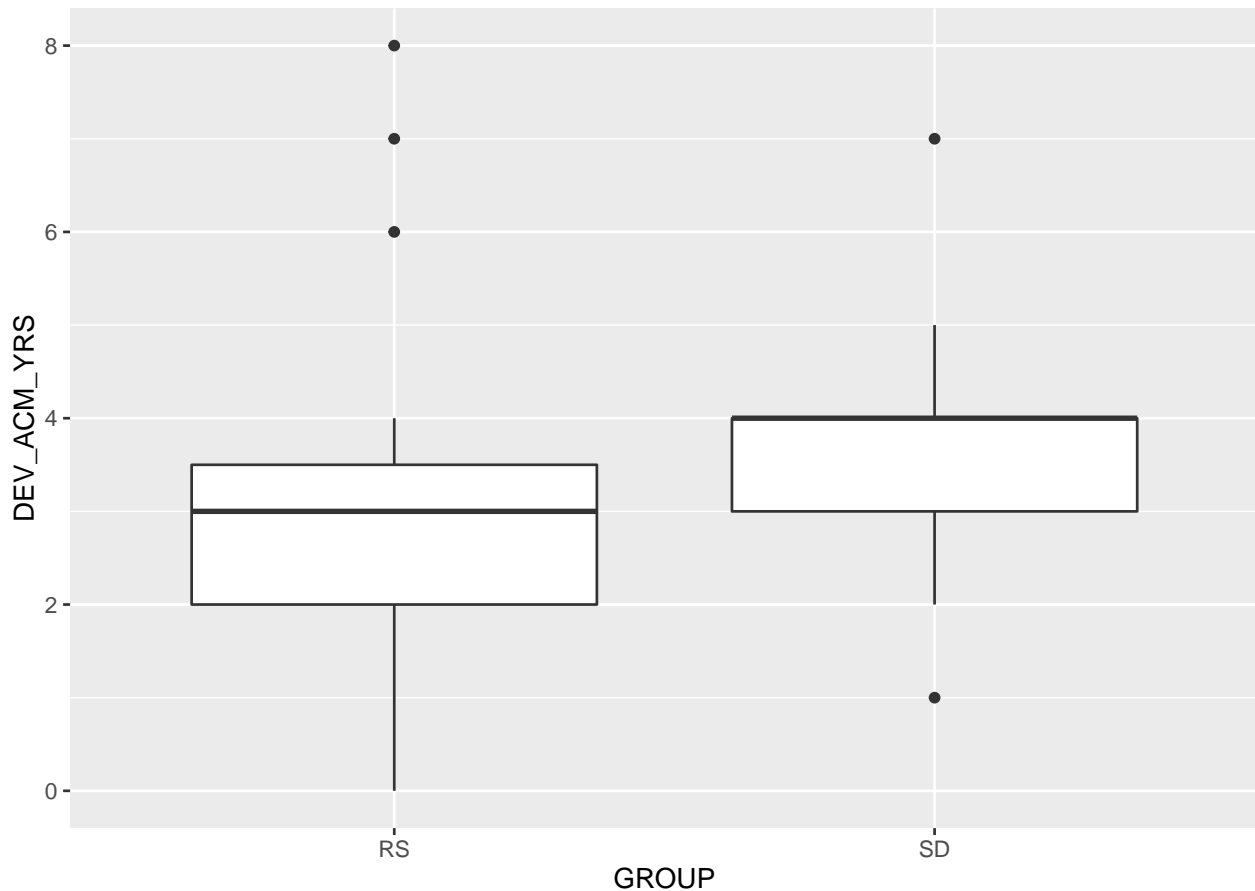
Table 2: Kruskal-Wallis rank sum test: DEV_GENERAL by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.04476 | 1 | 0.8325 |

Using Kruskal-Wallis test it seems that there is **no evidence** the DEV experience come from different populations.

Academic

```
ggplot(na.omit(sleep), aes(x=GROUP, y=DEV_ACM_YRS)) + geom_boxplot()
```



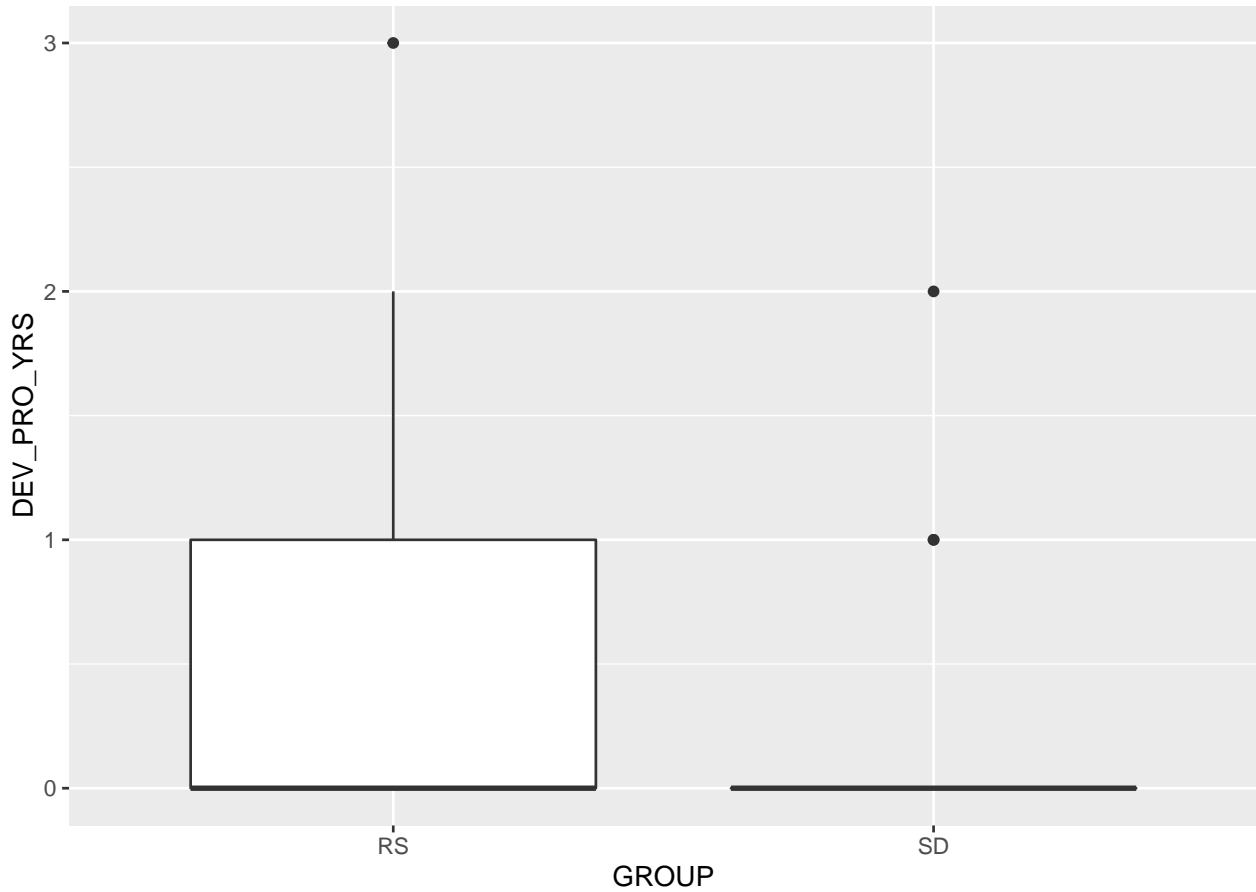
```
pander(ks.test(na.omit(sleep[GROUP=='SD'],]$DEV_ACM_YRS), na.omit(sleep[GROUP=='RS'],]$DEV_ACM_YRS)))
```

Table 3: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$DEV_ACM_YRS) and
na.omit(sleep[GROUP == "RS",]\$DEV_ACM_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.336 | 0.1579 | two-sided |

Professional

```
ggplot(na.omit(sleep), aes(x=GROUP, y=DEV_PRO_YRS)) + geom_boxplot()
```



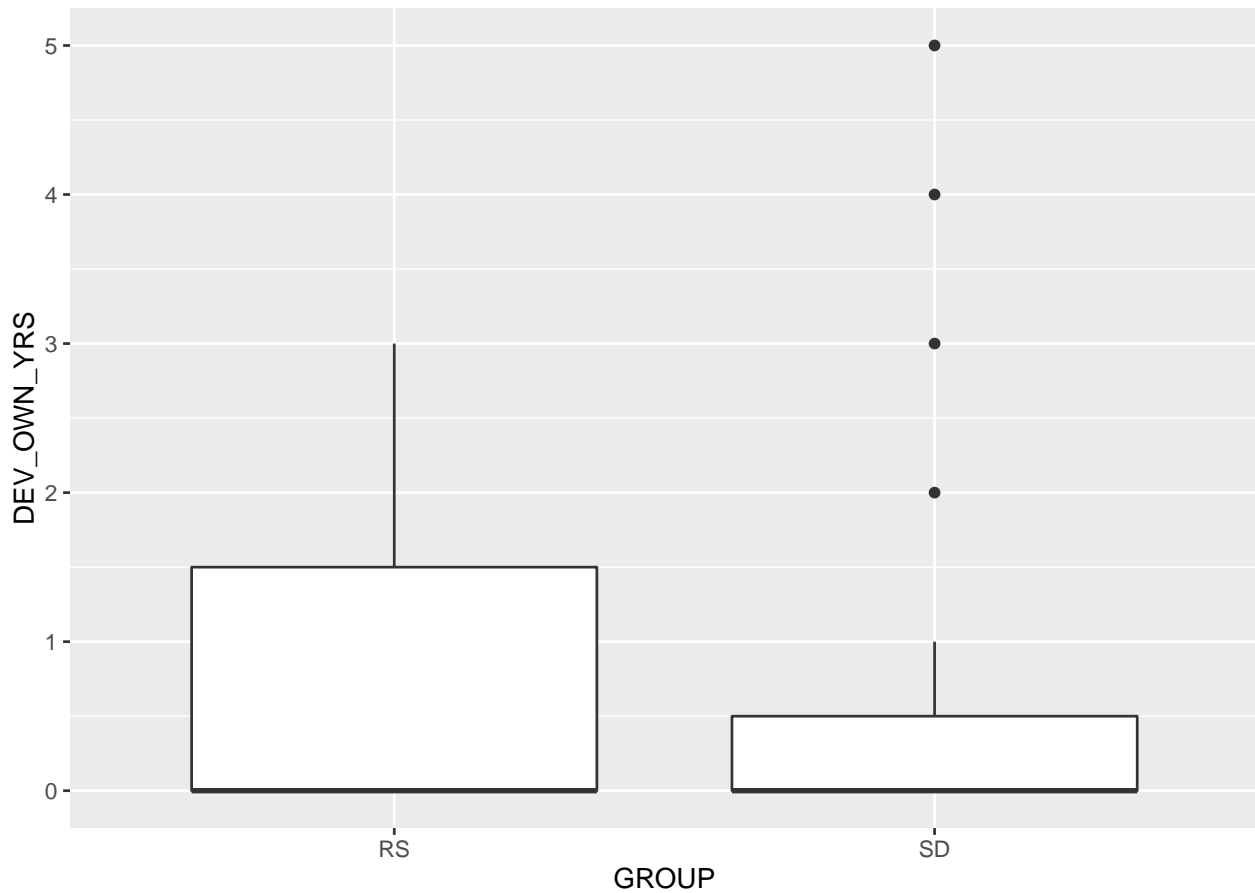
```
pander(ks.test(na.omit(sleep[GROUP=='SD',]$DEV_PRO_YRS), na.omit(sleep[GROUP=='RS',]$DEV_PRO_YRS)))
```

| | | | |
|---|------------|--------------------|-------|
| Table 4: | Two-sample | Kolmogorov-Smirnov | test: |
| <code>na.omit(sleep[GROUP == "SD",]\$DEV_PRO_YRS)</code> | | | and |
| <code>na.omit(sleep[GROUP == "RS",]\$DEV_PRO_YRS)</code> | | | |

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.09684 | 0.9999 | two-sided |

Own projects

```
ggplot(na.omit(sleep), aes(x=GROUP, y=DEV_OWN_YRS)) + geom_boxplot()
```



```
pander(ks.test(na.omit(sleep[GROUP=="SD"],]$DEV_OWN_YRS), na.omit(sleep[GROUP=="RS"],]$DEV_OWN_YRS)))
```

Table 5: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$DEV_OWN_YRS) and
na.omit(sleep[GROUP == "RS",]\$DEV_OWN_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.1047 | 0.9997 | two-sided |

There is no evidence that make us suspect a difference in terms of years in software development between the two groups.

Test-driven development

```
pander(table(GROUP, EXP_TDD))
```

Table 6: Table continues below

| | Experienced | Inexperienced | Neither experienced nor inexperienced |
|----|-------------|---------------|---------------------------------------|
| RS | 1 | 8 | 5 |
| SD | 1 | 12 | 2 |

| | Very inexperienced |
|-----------|--------------------|
| RS | 8 |
| SD | 8 |

There appear to be roughly the same number of subjects in all the levels (*very experienced* has no subjects in both groups, therefore it is not reported).

```
pander(kruskal.test(EXP_TDD~GROUP))
```

Table 8: Kruskal-Wallis rank sum test: EXP_TDD by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.3881 | 1 | 0.5333 |

Using Kruskal-Wallis test it seems that there is **no evidence** the TDD experience come from different populations.

Object oriented / Java

```
pander(table(GROUP, OOP_GENERAL))
```

| | Experienced | Inexperienced | Neither experienced nor inexperienced | Very experienced |
|-----------|-------------|---------------|--|------------------|
| RS | 3 | 3 | 15 | 1 |
| SD | 2 | 3 | 18 | 0 |

There appear to be roughly the same number of subjects in all the levels (*very inexperienced* has no subjects in both groups, therefore it is not reported).

```
pander(kruskal.test(OOP_GENERAL~GROUP))
```

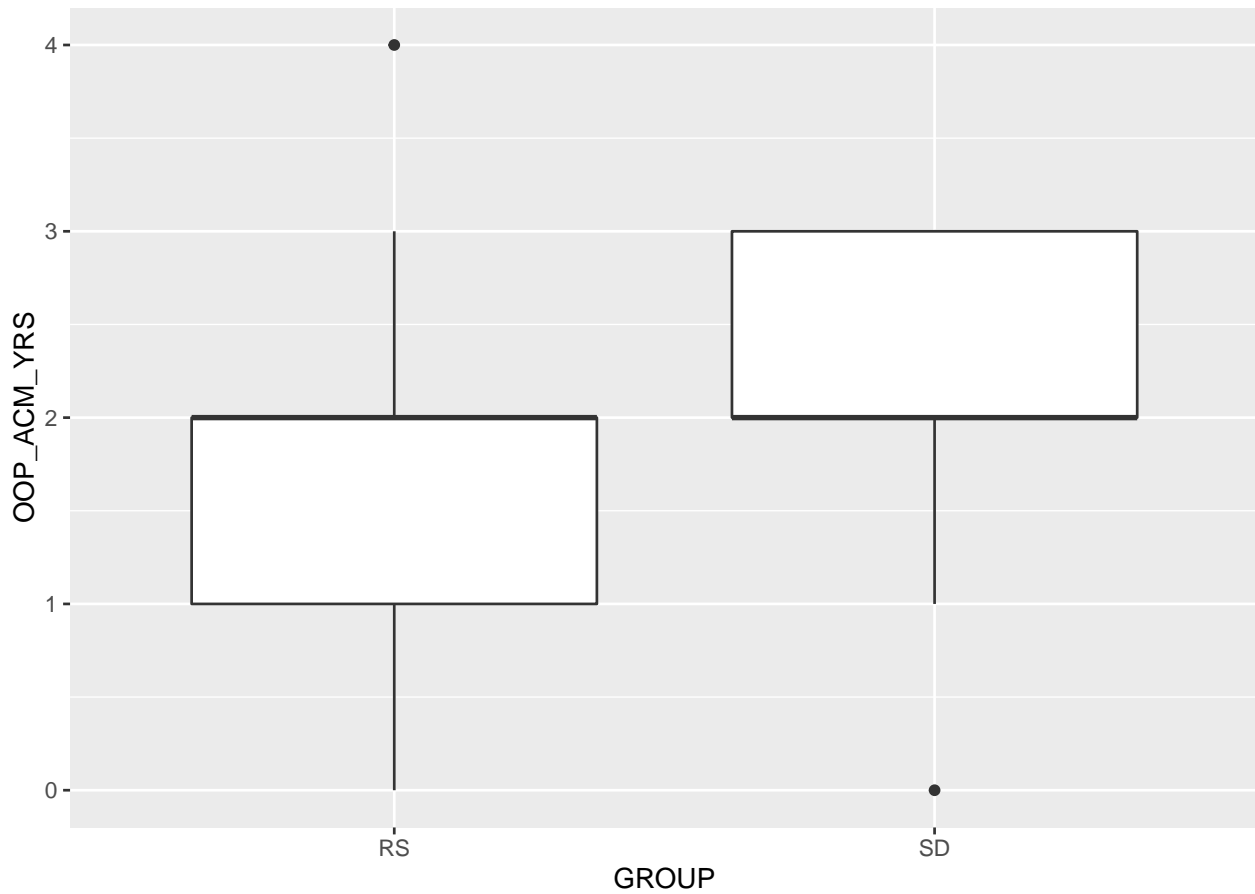
Table 10: Kruskal-Wallis rank sum test: OOP_GENERAL by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.03617 | 1 | 0.8492 |

Using Kruskal-Wallis test it seems that there is **no evidence** the OOP experience come from different populations.

Academic

```
ggplot(na.omit(sleep), aes(x=GROUP, y=OOP_ACM_YRS)) + geom_boxplot()
```



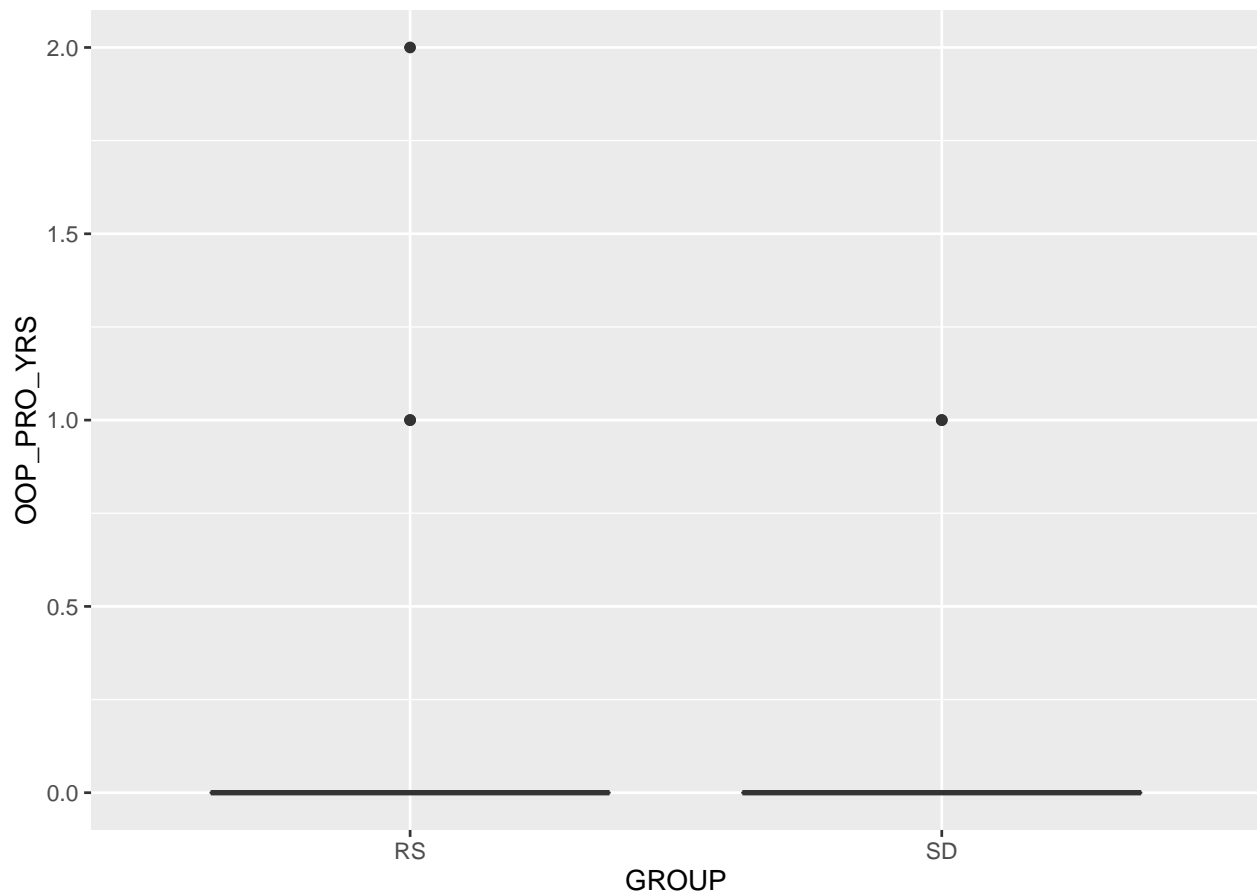
```
pander(ks.test(na.omit(sleep[GROUP=="SD",]$OOP_ACM_YRS), na.omit(sleep[GROUP=="RS",]$OOP_ACM_YRS)))
```

Table 11: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$OOP_ACM_YRS) and
na.omit(sleep[GROUP == "RS",]\$OOP_ACM_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.3696 | 0.09269 | two-sided |

Professional

```
ggplot(na.omit(sleep), aes(x=GROUP, y=OOP_PRO_YRS)) + geom_boxplot()
```



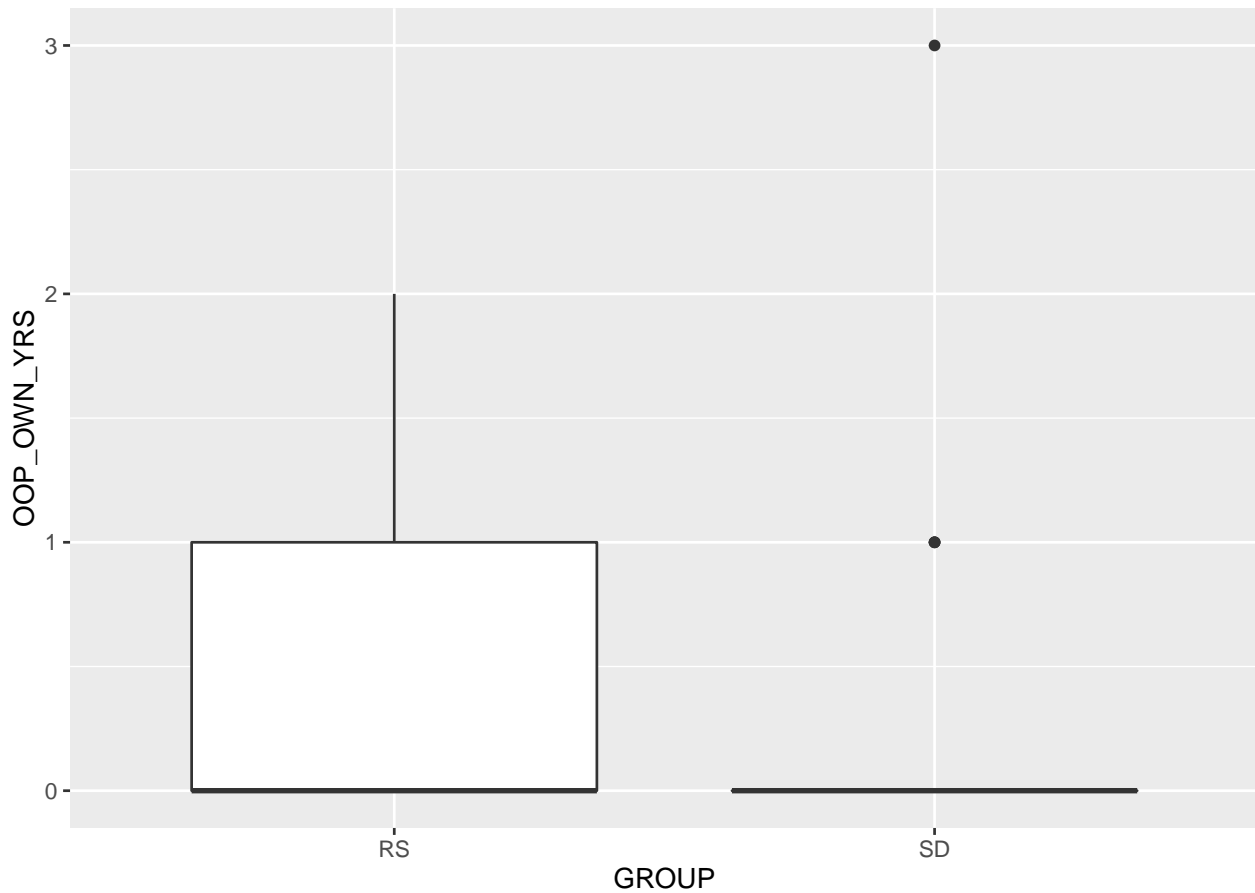
```
pander(na.omit(ks.test(na.omit(sleep[GROUP=="SD"],]$OOP_PRO_YRS), na.omit(sleep[GROUP=="RS"],]$OOP_PRO_YRS)
```

Table 12: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$OOP_PRO_YRS) and
na.omit(sleep[GROUP == "RS",]\$OOP_PRO_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.04348 | 1 | two-sided |

Own projects

```
ggplot(na.omit(sleep), aes(x=GROUP, y=OOP_OWN_YRS)) + geom_boxplot()
```



```
pander(ks.test(na.omit(sleep[GROUP=='SD'],]$OOP_OWN_YRS), na.omit(sleep[GROUP=='RS'],]$OOP_OWN_YRS)))
```

Table 13: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$OOP_OWN_YRS) and
na.omit(sleep[GROUP == "RS",]\$OOP_OWN_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.04348 | 1 | two-sided |

There is not evidence that make us suspect a difference in terms of years in object oriented Java development between the two groups.

Unit testing

```
pander(table(GROUP, UT_GENERAL))
```

| | Expert (>10 years) | No experience (<2 years) | Novice (2-<=5 years) |
|-----------|--------------------|--------------------------|----------------------|
| RS | 1 | 18 | 3 |
| SD | 0 | 20 | 3 |

There appear to be roughly the same number of subjects in all the levels (*very experienced* and *complete*

novice have no subjects for both groups, therefore are not reported).

```
pander(kruskal.test(UT_GENERAL~GROUP, data = na.omit(sleep)))
```

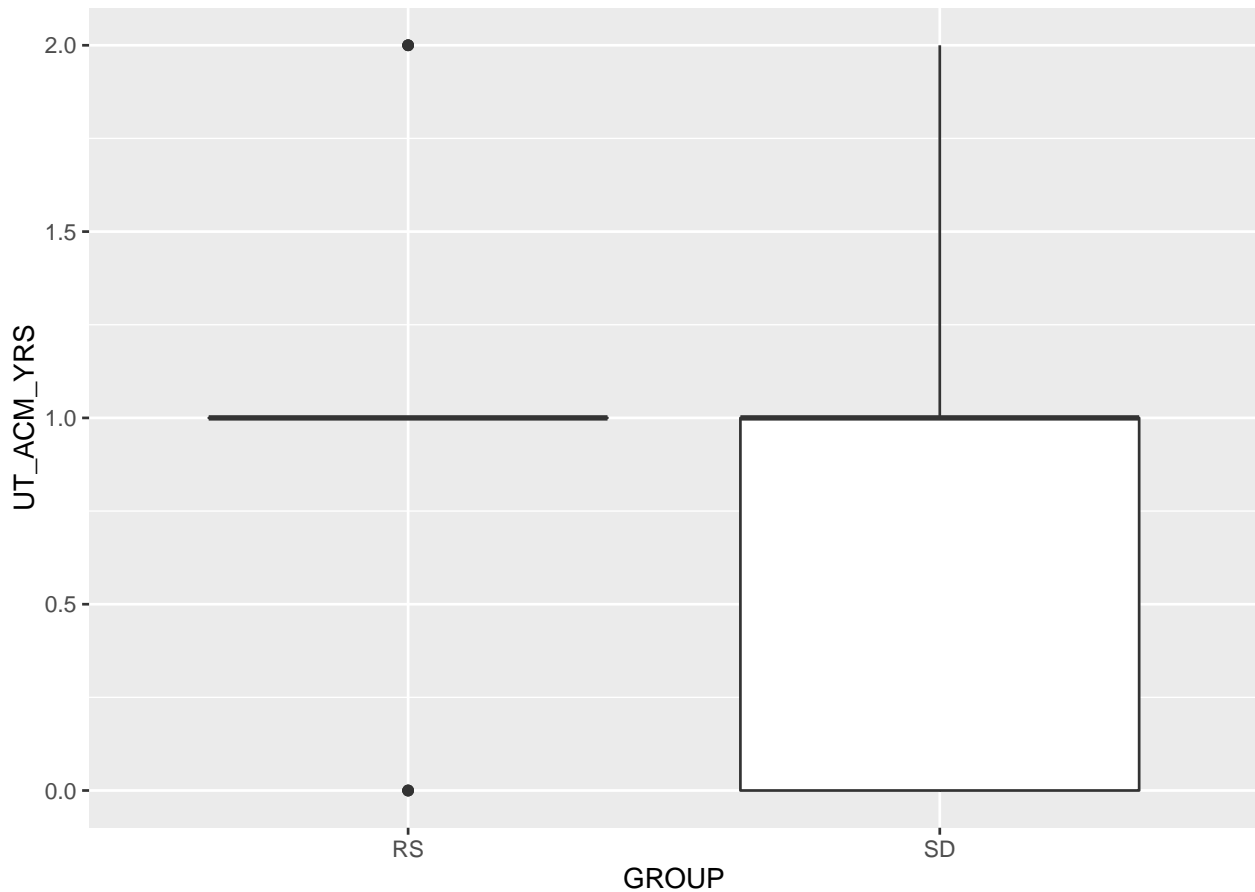
Table 15: Kruskal-Wallis rank sum test: UT_GENERAL by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.1789 | 1 | 0.6723 |

Using Kruskal-Wallis test it seems that there is **no evidence** the DEV experience come from different populations.

Academic

```
ggplot(na.omit(sleep), aes(x=GROUP, y=UT_ACM_YRS)) + geom_boxplot()
```



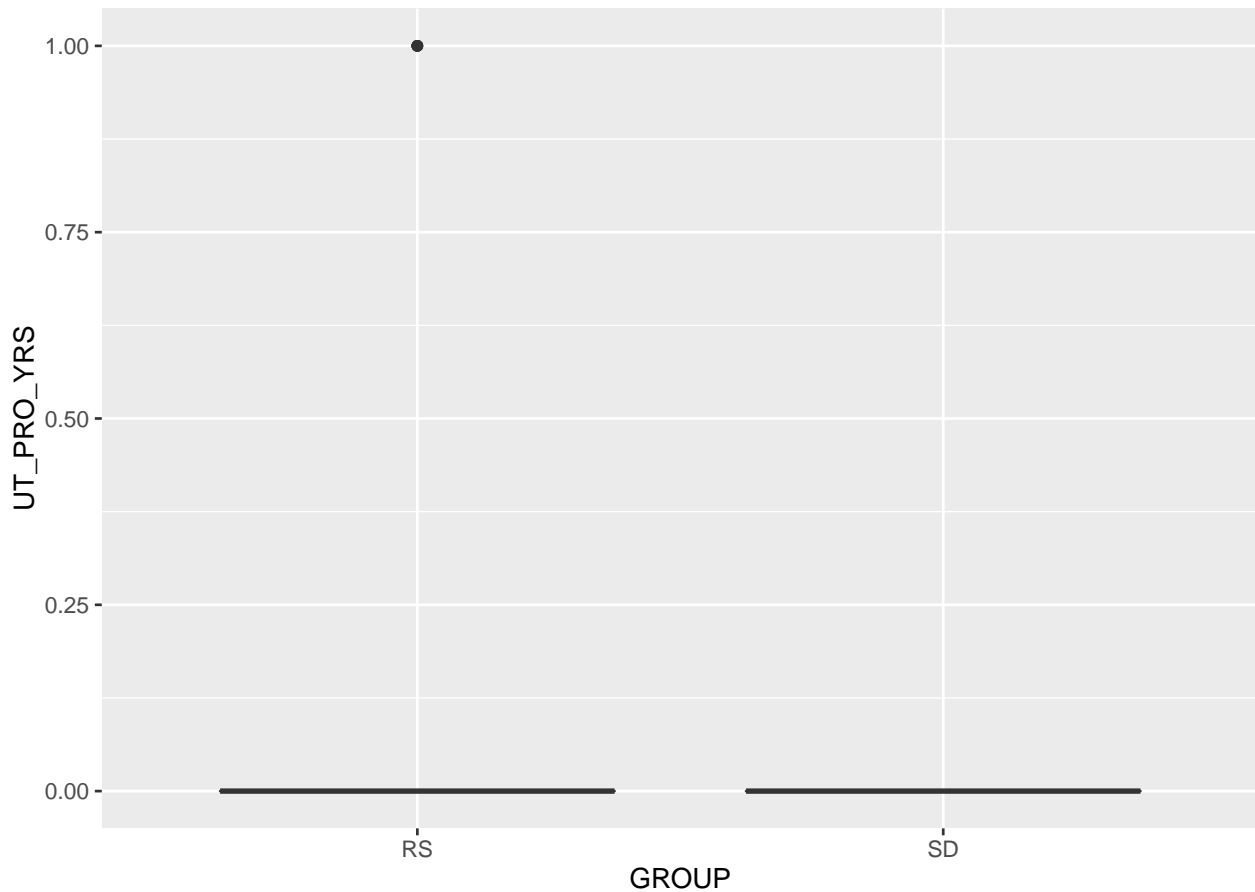
```
pander(ks.test(na.omit(sleep[GROUP=="SD",]$UT_ACM_YRS), na.omit(sleep[GROUP=="RS",]$UT_ACM_YRS)))
```

Table 16: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$UT_ACM_YRS) and
na.omit(sleep[GROUP == "RS",]\$UT_ACM_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.2549 | 0.4579 | two-sided |

Professional

```
ggplot(na.omit(sleep), aes(x=GROUP, y=UT_PRO_YRS)) + geom_boxplot()
```



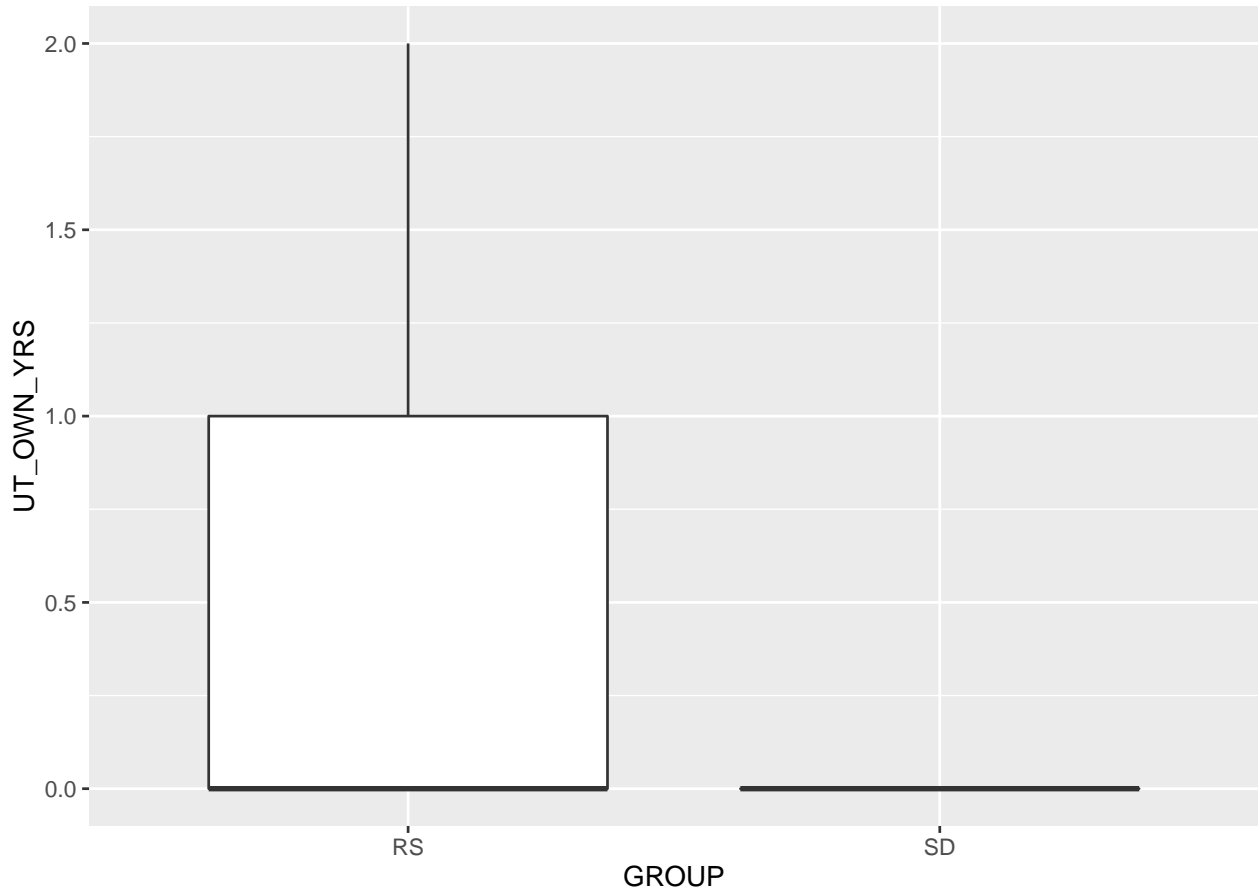
```
pander(ks.test(na.omit(sleep[GROUP=="SD",]$UT_PRO_YRS), na.omit(sleep[GROUP=="RS",]$UT_PRO_YRS)))
```

Table 17: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$UT_PRO_YRS) and
na.omit(sleep[GROUP == "RS",]\$UT_PRO_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.09486 | 1 | two-sided |

Own projects

```
ggplot(na.omit(sleep), aes(x=GROUP, y=UT_OWN_YRS)) + geom_boxplot()
```



```
pander(ks.test(na.omit(sleep[GROUP=='SD'],]$UT_OWN_YRS), na.omit(sleep[GROUP=='RS'],]$DEV_OWN_YRS)))
```

Table 18: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$UT_OWN_YRS) and
na.omit(sleep[GROUP == "RS",]\$DEV_OWN_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.3221 | 0.1937 | two-sided |

There is not evidence that make us suspect a difference in terms of years of unit testing development between the two groups.

Eclipse IDE

```
pander(table(GROUP, IDE_GENERAL))
```

Table 19: Table continues below

| | Intermediate (5-<=10 years) | No experience (<2 years) |
|-----------|-----------------------------|--------------------------|
| RS | 2 | 15 |
| SD | 0 | 20 |

| Novice (2-<=5 years) | |
|----------------------|---|
| RS | 5 |
| SD | 3 |

It appears that the SD subjects have no experience regarding the IDE (e.g., 21 v. 14) (*experienced* and *very experienced* have no subjects in both groups, therefore are not reported).

```
pander(kruskal.test(IDE_GENERAL~GROUP, data=na.omit(sleep)))
```

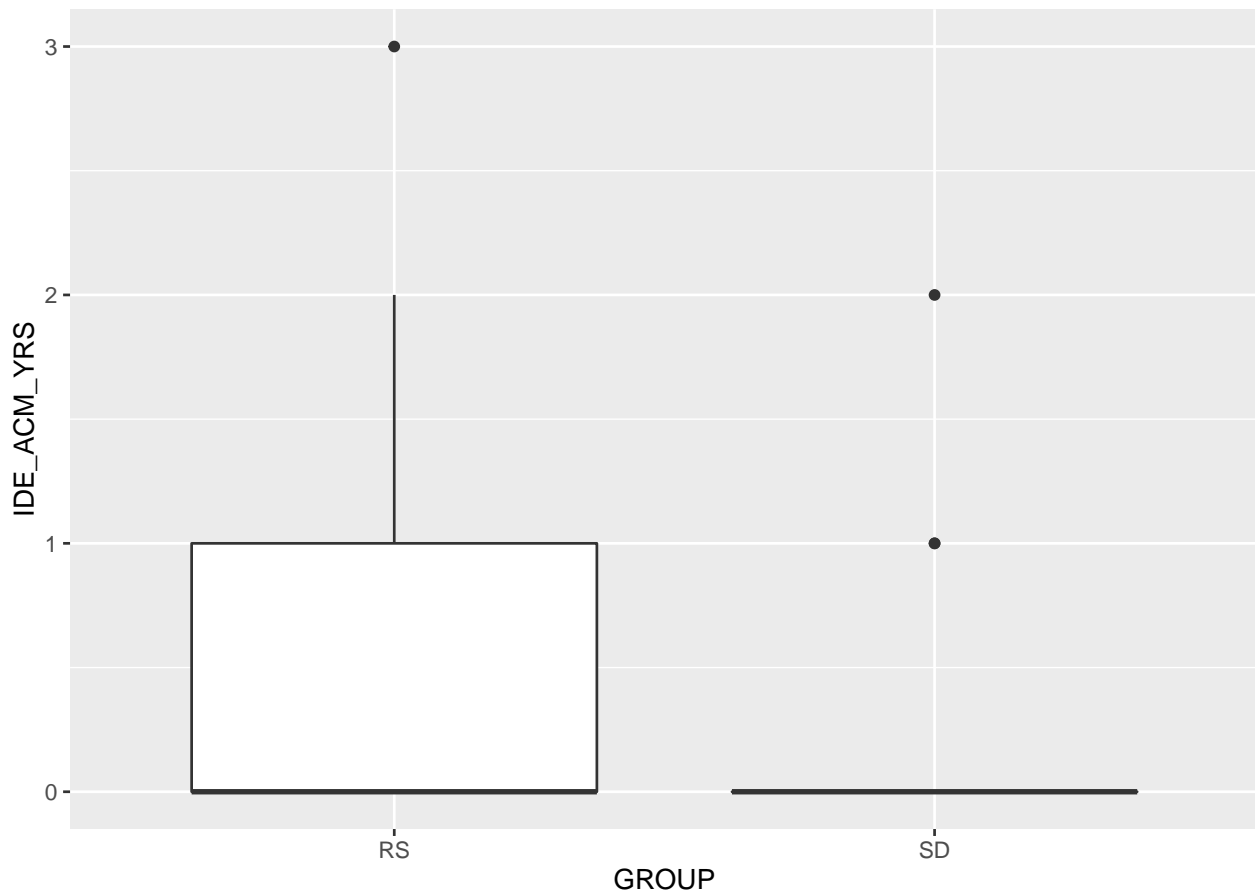
Table 21: Kruskal-Wallis rank sum test: IDE_GENERAL by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.2065 | 1 | 0.6495 |

Using Kruskal-Wallis test it seems that there is **no evidence** the DEV experience come from different populations.

Academic

```
ggplot(na.omit(sleep), aes(x=GROUP, y=IDE_ACM_YRS)) + geom_boxplot()
```



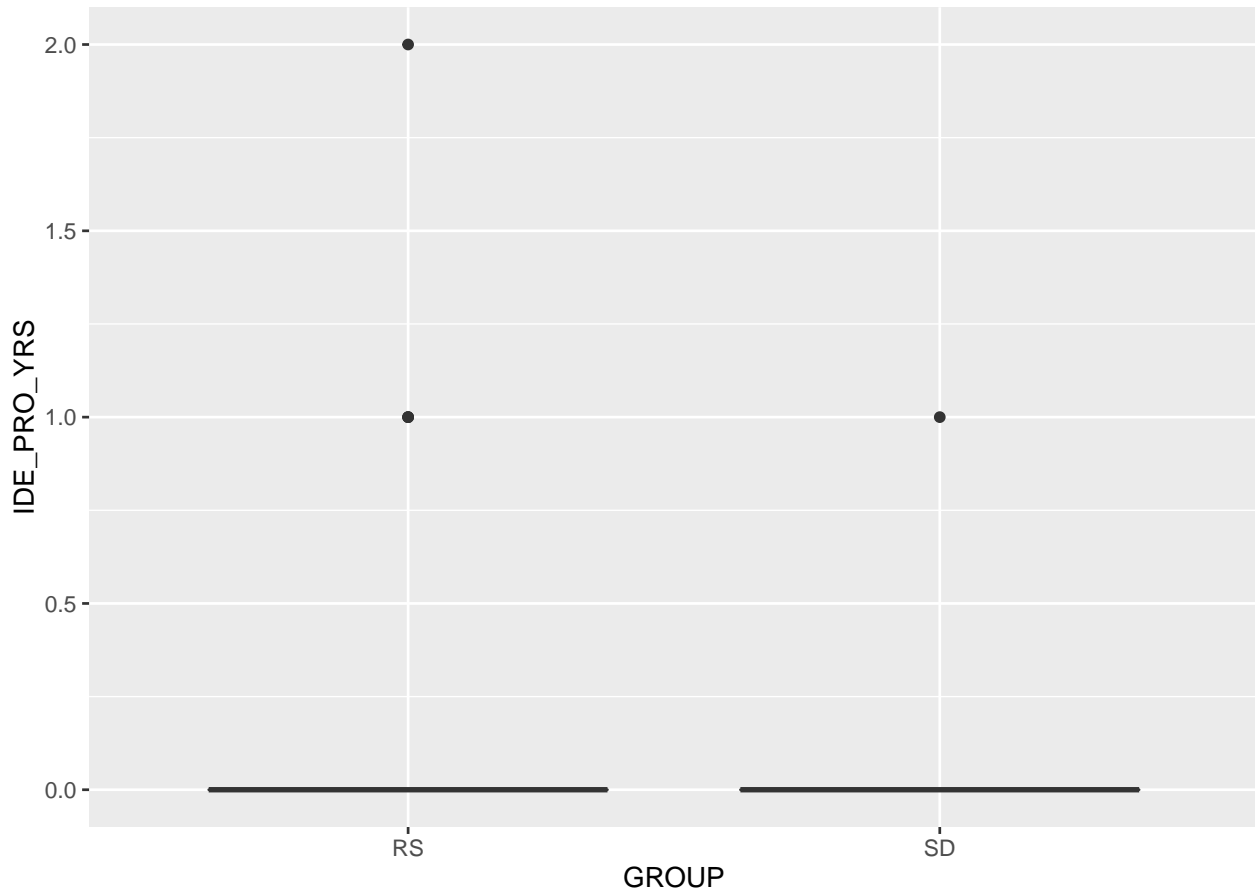
```
pander(ks.test(na.omit(sleep[GROUP=='SD'],]$IDE_ACM_YRS), na.omit(sleep[GROUP=='RS'],]$IDE_ACM_YRS)))
```

Table 22: Two-sample Kolmogorov-Smirnov test:
`na.omit(sleep[GROUP == "SD",]$IDE_ACM_YRS)` and
`na.omit(sleep[GROUP == "RS",]$IDE_ACM_YRS)`

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.2787 | 0.347 | two-sided |

Professional

```
ggplot(na.omit(sleep), aes(x=GROUP, y=IDE_PRO_YRS)) + geom_boxplot()
```



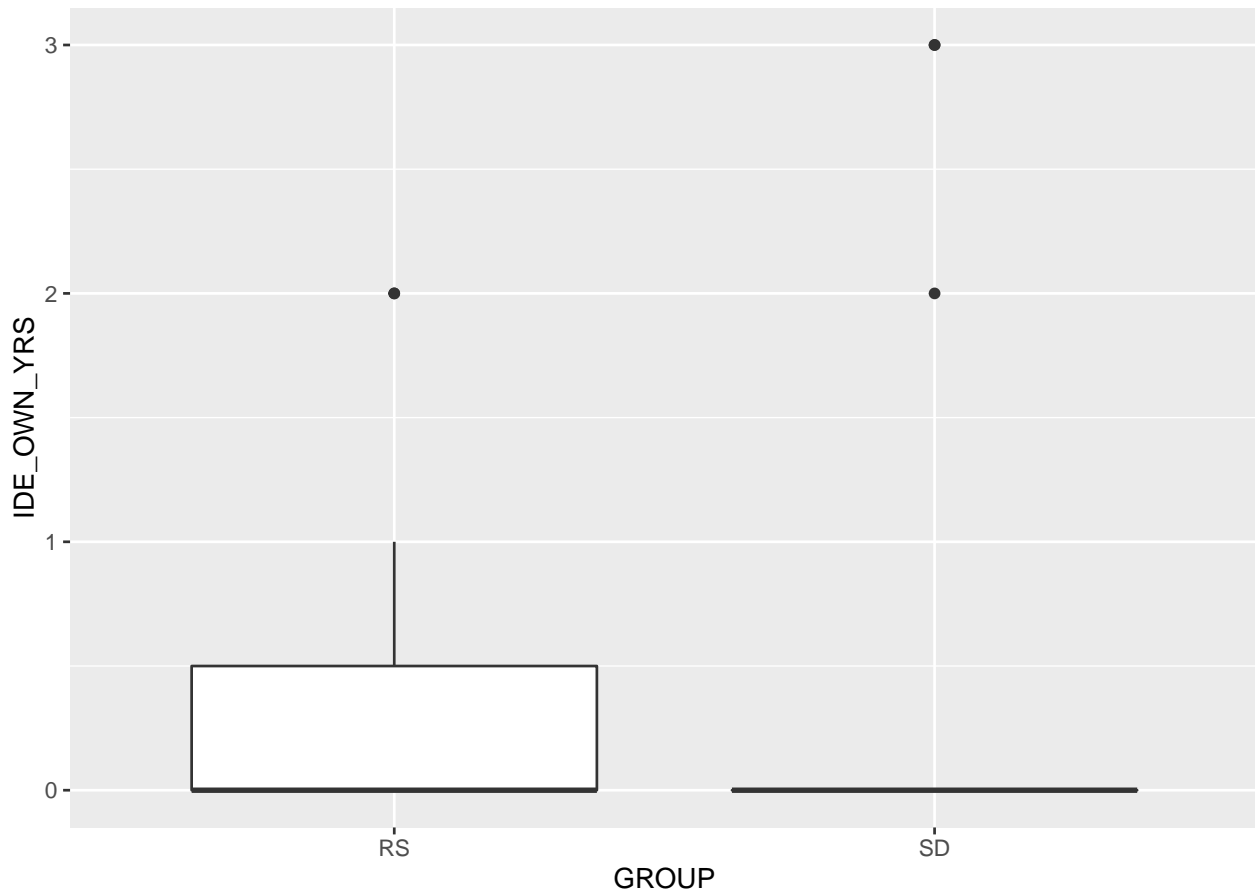
```
pander(ks.test(na.omit(sleep[GROUP=="SD", ]$IDE_PRO_YRS), na.omit(sleep[GROUP=="RS", ]$IDE_PRO_YRS)))
```

Table 23: Two-sample Kolmogorov-Smirnov test:
`na.omit(sleep[GROUP == "SD",]$IDE_PRO_YRS)` and
`na.omit(sleep[GROUP == "RS",]$IDE_PRO_YRS)`

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.1403 | 0.9798 | two-sided |

Own projects

```
ggplot(na.omit(sleep), aes(x=GROUP, y=IDE_OWN_YRS)) + geom_boxplot()
```



```
pander(ks.test(na.omit(sleep[GROUP=="SD",]$IDE_OWN_YRS), na.omit(sleep[GROUP=="RS",]$DEV_OWN_YRS)))
```

Table 24: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$IDE_OWN_YRS) and
na.omit(sleep[GROUP == "RS",]\$DEV_OWN_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.2352 | 0.5628 | two-sided |

There is not evidence that make us suspect a difference in terms of years of use of Eclipse IDE between the two groups.

Skill analysis on the cleaned dataset (n = 37)

The analysis reported below do not take into account the participants in the *SD* group removed after testing them with PVT.

```
sleep <- read.csv("~/Projects/SleepDeprivation/experience.csv", sep=",")
sleep <- sleep[NONCONFORMANT=="N",]
attach(sleep)
```

Software development in general

```
pander::pander(table(GROUP, DEV_GENERAL))
```

| | Experienced | Inexperienced | Neither experienced nor inexperienced | Very experienced |
|-----------|-------------|---------------|--|------------------|
| RS | 3 | 1 | 16 | 2 |
| SD | 1 | 1 | 13 | 0 |

There appear to be roughly the same number of subjects in all the levels (*very experienced* has no subjects in both groups, therefore it is not reported).

```
pander(kruskal.test(DEV_GENERAL~GROUP))
```

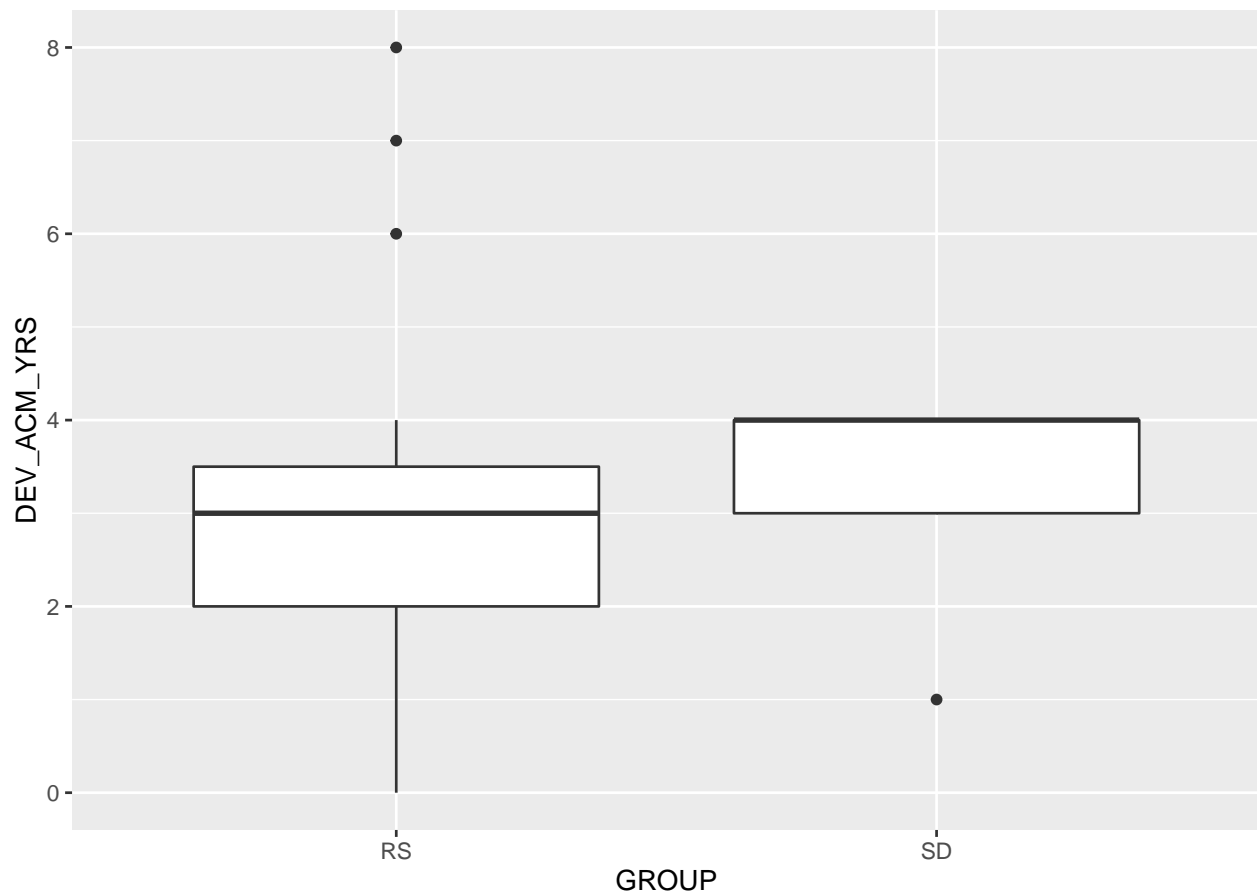
Table 26: Kruskal-Wallis rank sum test: DEV_GENERAL by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.0296 | 1 | 0.8634 |

Using Kruskal-Wallis test it seems that there is **no evidence** the DEV experience come from different populations.

Academic

```
ggplot(na.omit(sleep), aes(x=GROUP, y=DEV_ACM_YRS)) + geom_boxplot()
```



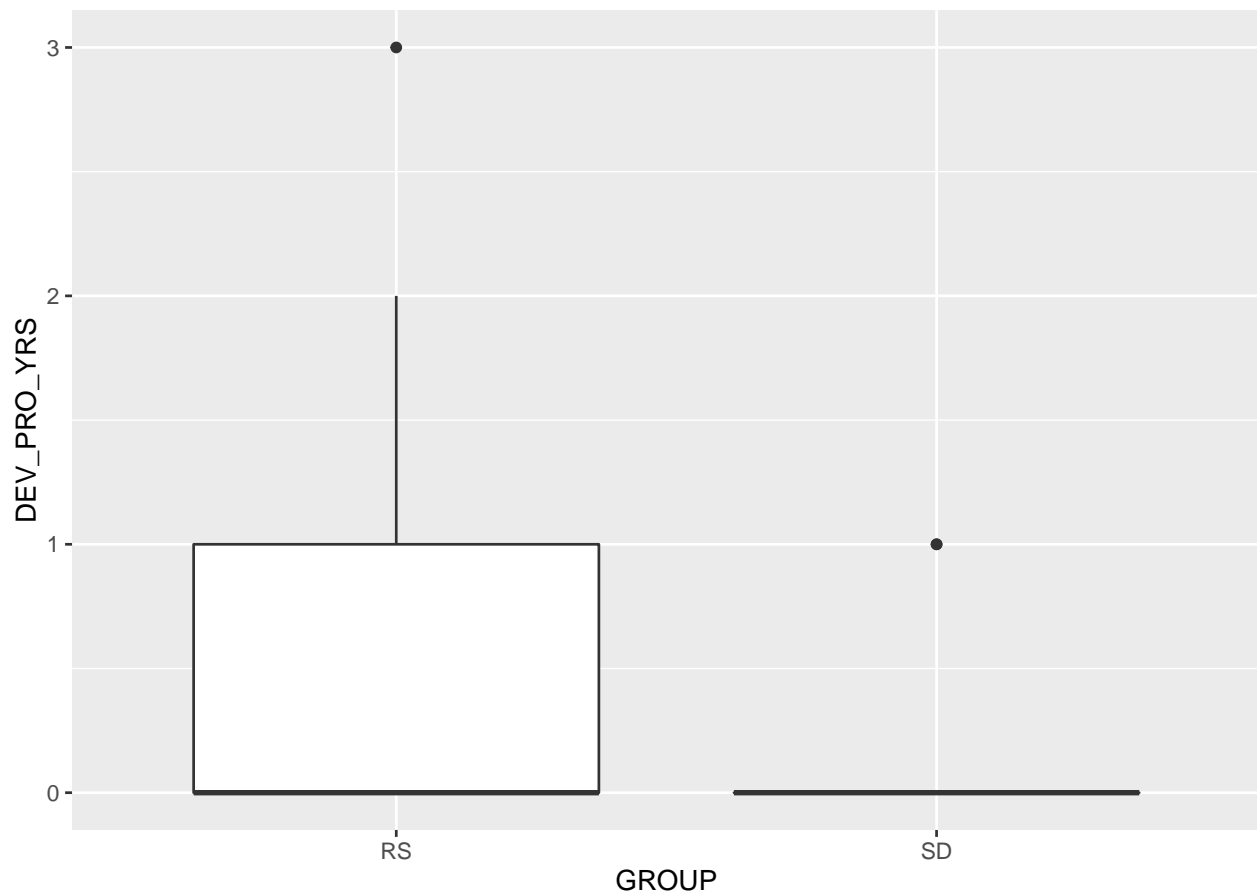
```
pander(ks.test(na.omit(sleep[GROUP=="SD"],]$DEV_ACM_YRS), na.omit(sleep[GROUP=="RS"],]$DEV_ACM_YRS)))
```

Table 27: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$DEV_ACM_YRS) and
na.omit(sleep[GROUP == "RS",]\$DEV_ACM_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.3273 | 0.2951 | two-sided |

Professional

```
ggplot(na.omit(sleep), aes(x=GROUP, y=DEV_PRO_YRS)) + geom_boxplot()
```

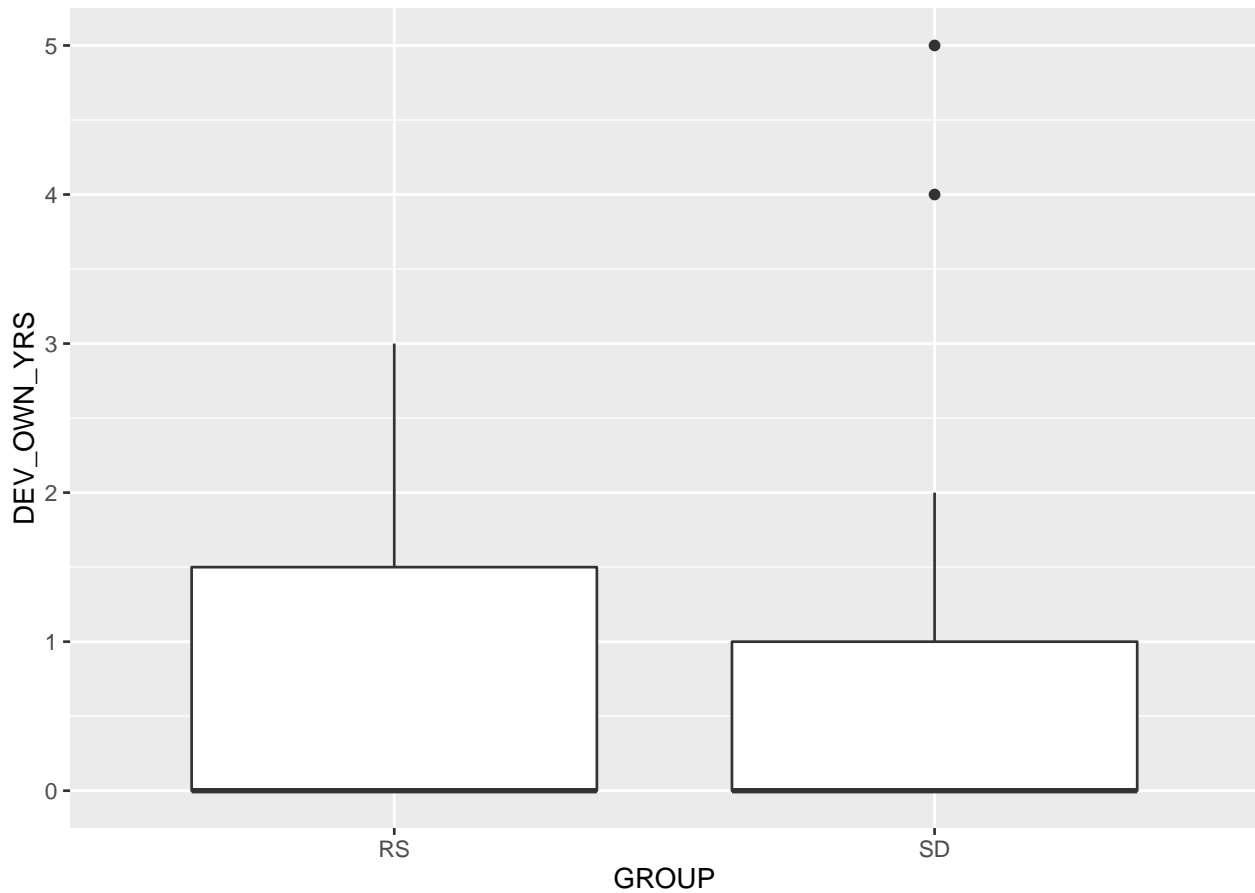
```
pander(ks.test(na.omit(sleep[GROUP=="SD",]$DEV_PRO_YRS), na.omit(sleep[GROUP=="RS",]$DEV_PRO_YRS)))
```

Table 28: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$DEV_PRO_YRS) and
na.omit(sleep[GROUP == "RS",]\$DEV_PRO_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.1606 | 0.9755 | two-sided |

Own projects

```
ggplot(na.omit(sleep), aes(x=GROUP, y=DEV_OWN_YRS)) + geom_boxplot()
```



```
pander(ks.test(na.omit(sleep[GROUP=='SD'],]$DEV_OWN_YRS), na.omit(sleep[GROUP=='RS'],]$DEV_OWN_YRS)))
```

Table 29: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$DEV_OWN_YRS) and
na.omit(sleep[GROUP == "RS",]\$DEV_OWN_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.08788 | 1 | two-sided |

There is no evidence that make us suspect a difference in terms of years in software development between the two groups.

Test-driven development

```
pander(table(GROUP, EXP_TDD))
```

Table 30: Table continues below

| | Experienced | Inexperienced | Neither experienced nor inexperienced |
|-----------|-------------|---------------|---------------------------------------|
| RS | 1 | 8 | 5 |
| SD | 1 | 8 | 2 |

| | Very inexperienced |
|-----------|--------------------|
| RS | 8 |
| SD | 4 |

There appear to be roughly the same number of subjects in all the levels (*very experienced* has no subjects in both groups, therefore it is not reported).

```
pander(kruskal.test(EXP_TDD~GROUP))
```

Table 32: Kruskal-Wallis rank sum test: EXP_TDD by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.9477 | 1 | 0.3303 |

Using Kruskal-Wallis test it seems that there is **no evidence** the TDD experience come from different populations.

Object oriented / Java

```
pander(table(GROUP, OOP_GENERAL))
```

| | Experienced | Inexperienced | Neither experienced nor inexperienced | Very experienced |
|-----------|-------------|---------------|--|------------------|
| RS | 3 | 3 | 15 | 1 |
| SD | 1 | 3 | 11 | 0 |

There appear to be roughly the same number of subjects in all the levels (*very inexperienced* has no subjects in both groups, therefore it is not reported).

```
pander(kruskal.test(OOP_GENERAL~GROUP))
```

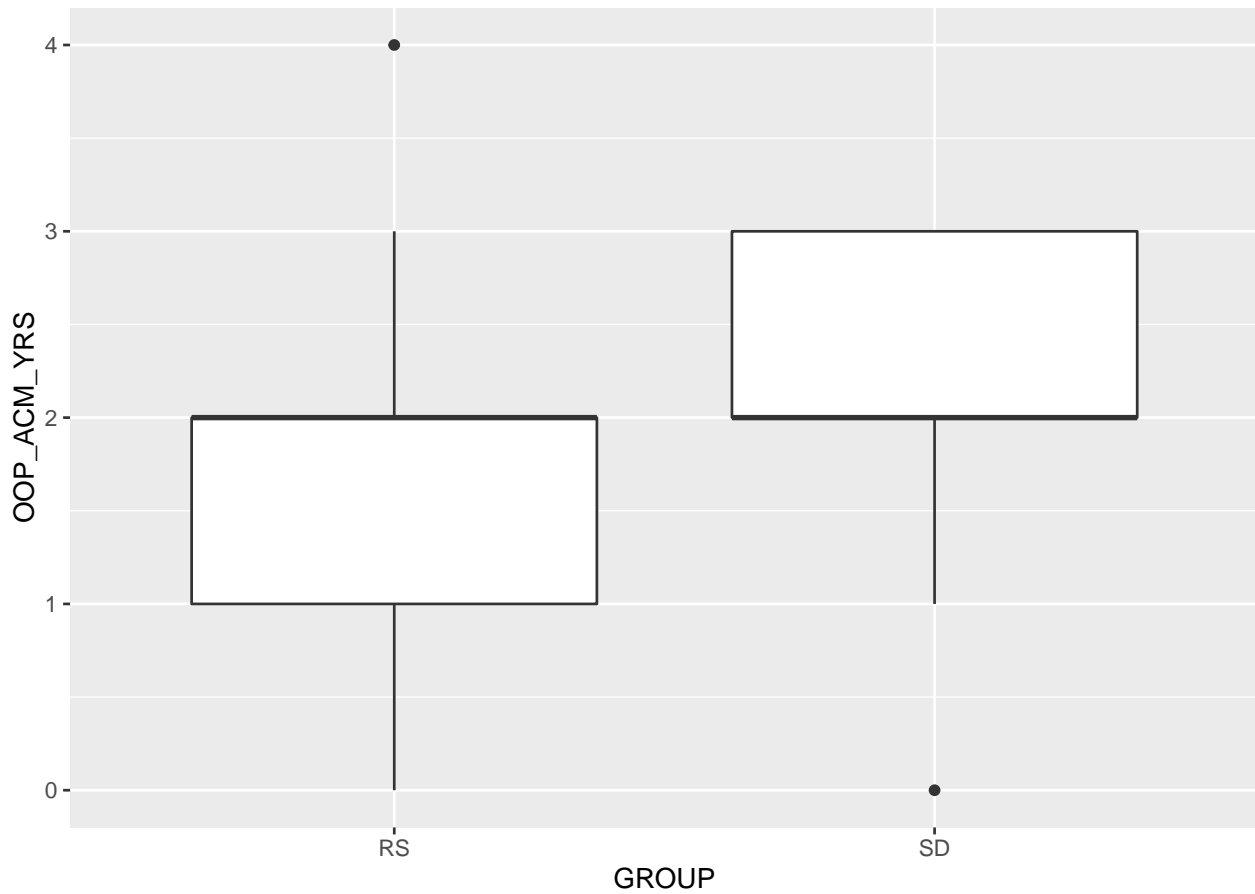
Table 34: Kruskal-Wallis rank sum test: OOP_GENERAL by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.003323 | 1 | 0.954 |

Using Kruskal-Wallis test it seems that there is **no evidence** the OOP experience come from different populations.

Academic

```
ggplot(na.omit(sleep), aes(x=GROUP, y=OOP_ACM_YRS)) + geom_boxplot()
```



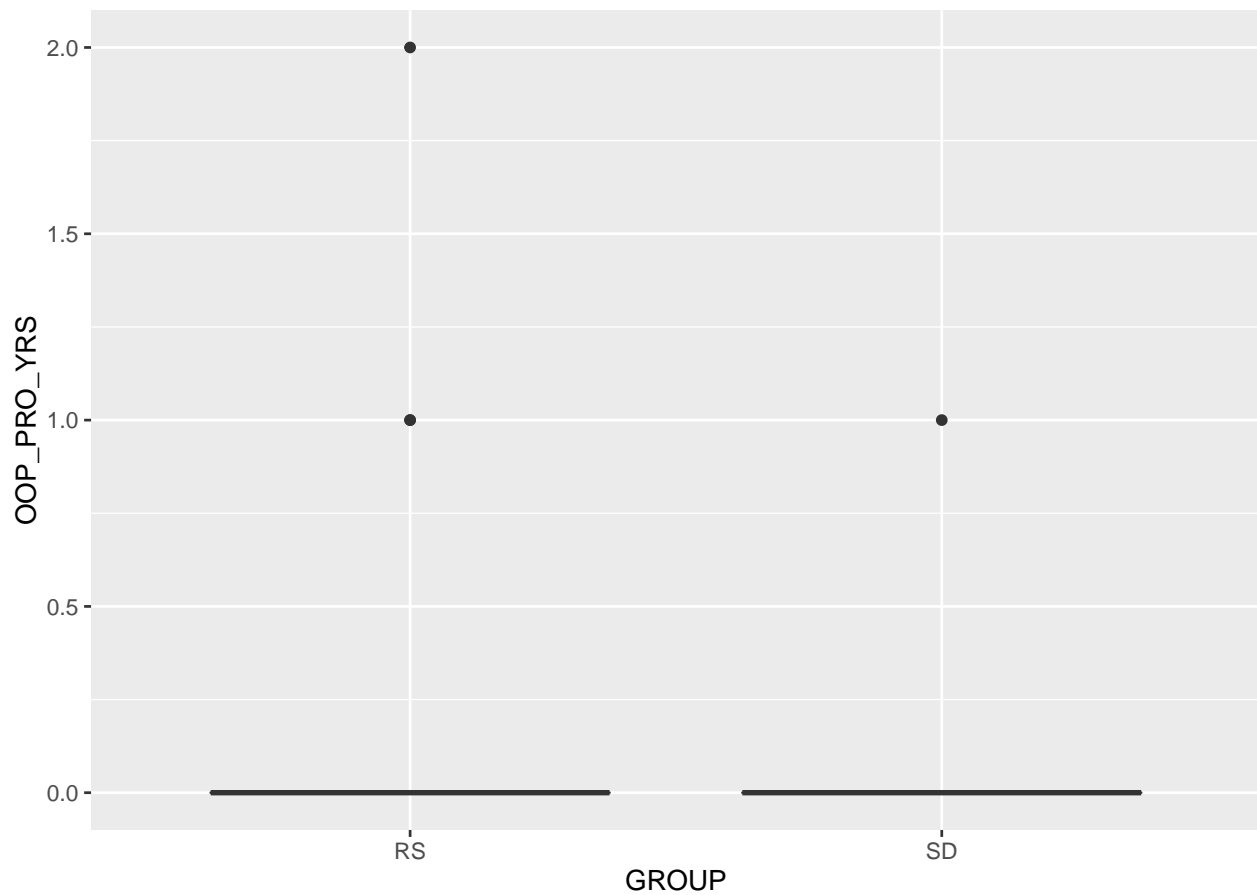
```
pander(ks.test(na.omit(sleep[GROUP=="SD",]$OOP_ACM_YRS), na.omit(sleep[GROUP=="RS",]$OOP_ACM_YRS)))
```

Table 35: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$OOP_ACM_YRS) and
na.omit(sleep[GROUP == "RS",]\$OOP_ACM_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.3667 | 0.1816 | two-sided |

Professional

```
ggplot(na.omit(sleep), aes(x=GROUP, y=OOP_PRO_YRS)) + geom_boxplot()
```



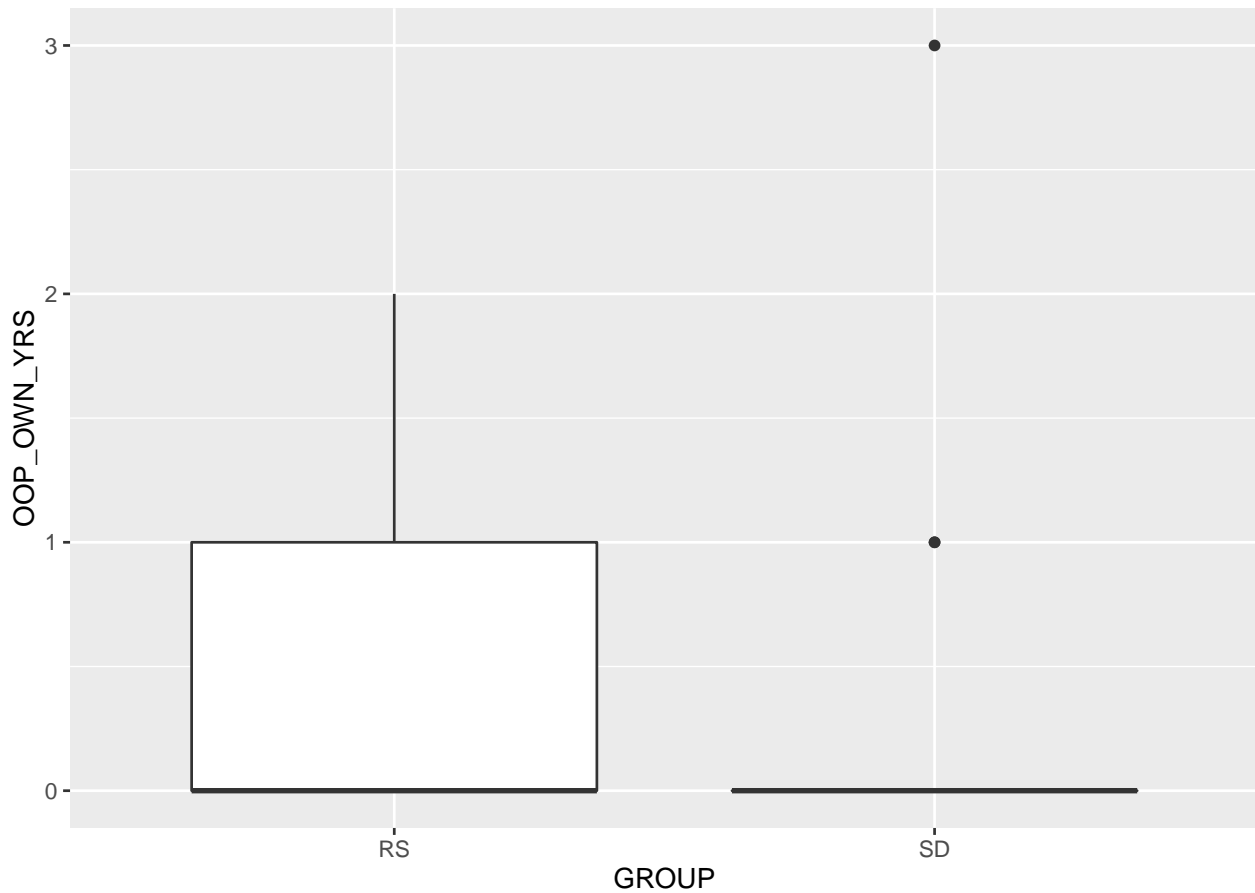
```
pander(na.omit(ks.test(na.omit(sleep[GROUP=="SD"],]$OOP_PRO_YRS), na.omit(sleep[GROUP=="RS"],]$OOP_PRO_YRS)
```

Table 36: Two-sample Kolmogorov-Smirnov test:
 na.omit(sleep[GROUP == "SD",]\$OOP_PRO_YRS) and
 na.omit(sleep[GROUP == "RS",]\$OOP_PRO_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.04848 | 1 | two-sided |

Own projects

```
ggplot(na.omit(sleep), aes(x=GROUP, y=OOP_OWN_YRS)) + geom_boxplot()
```



```
pander(ks.test(na.omit(sleep[GROUP=='SD'],]$OOP_OWN_YRS), na.omit(sleep[GROUP=='RS'],]$OOP_OWN_YRS)))
```

Table 37: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$OOP_OWN_YRS) and
na.omit(sleep[GROUP == "RS",]\$OOP_OWN_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.06667 | 1 | two-sided |

There is not evidence that make us suspect a difference in terms of years in object oriented Java development between the two groups.

Unit testing

```
pander(table(GROUP, UT_GENERAL))
```

| | Expert (>10 years) | No experience (<2 years) | Novice (2-<=5 years) |
|-----------|--------------------|--------------------------|----------------------|
| RS | 1 | 18 | 3 |
| SD | 0 | 14 | 1 |

There appear to be roughly the same number of subjects in all the levels (*very experienced* and *complete*

novice have no subjects for both groups, therefore are not reported).

```
pander(kruskal.test(UT_GENERAL~GROUP, data = na.omit(sleep)))
```

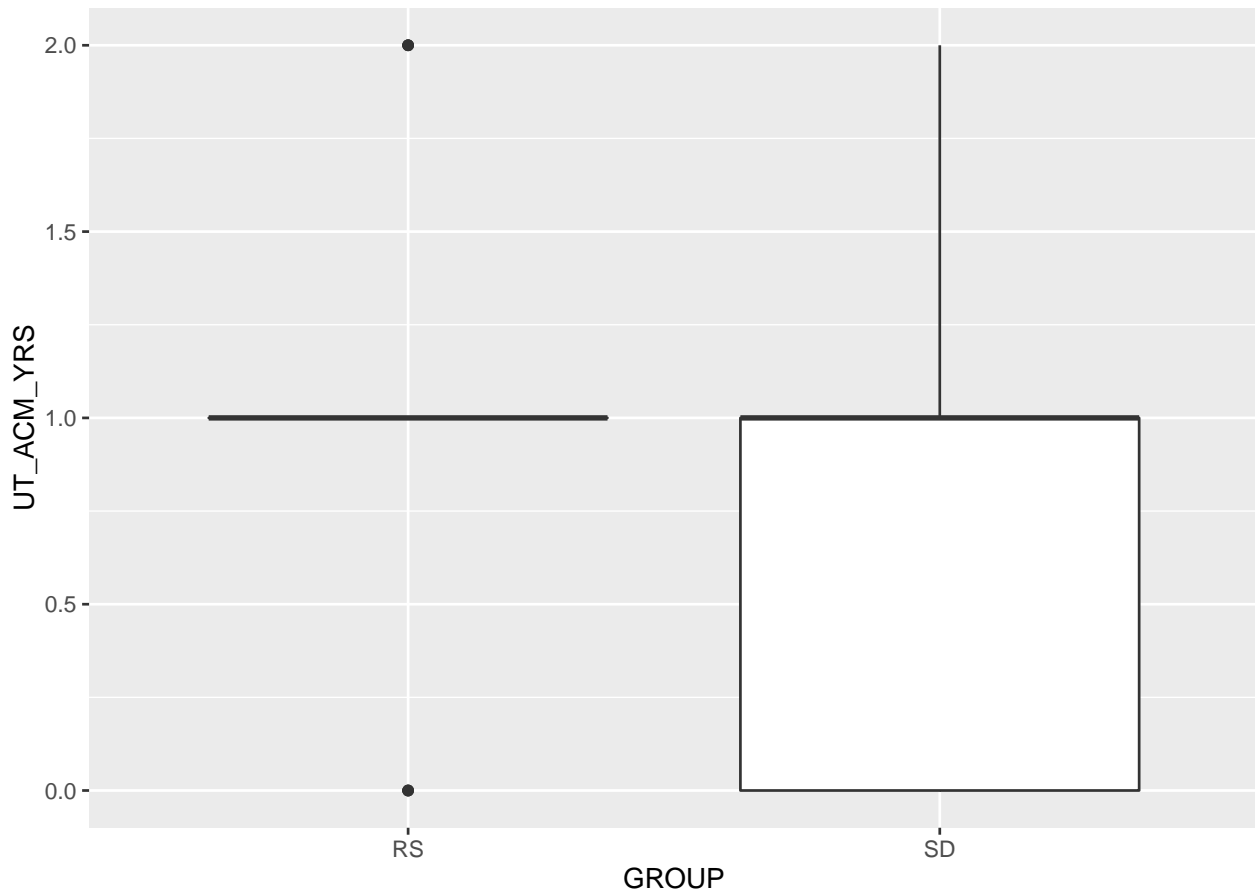
Table 39: Kruskal-Wallis rank sum test: UT_GENERAL by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.02792 | 1 | 0.8673 |

Using Kruskal-Wallis test it seems that there is **no evidence** the DEV experience come from different populations.

Academic

```
ggplot(na.omit(sleep), aes(x=GROUP, y=UT_ACM_YRS)) + geom_boxplot()
```



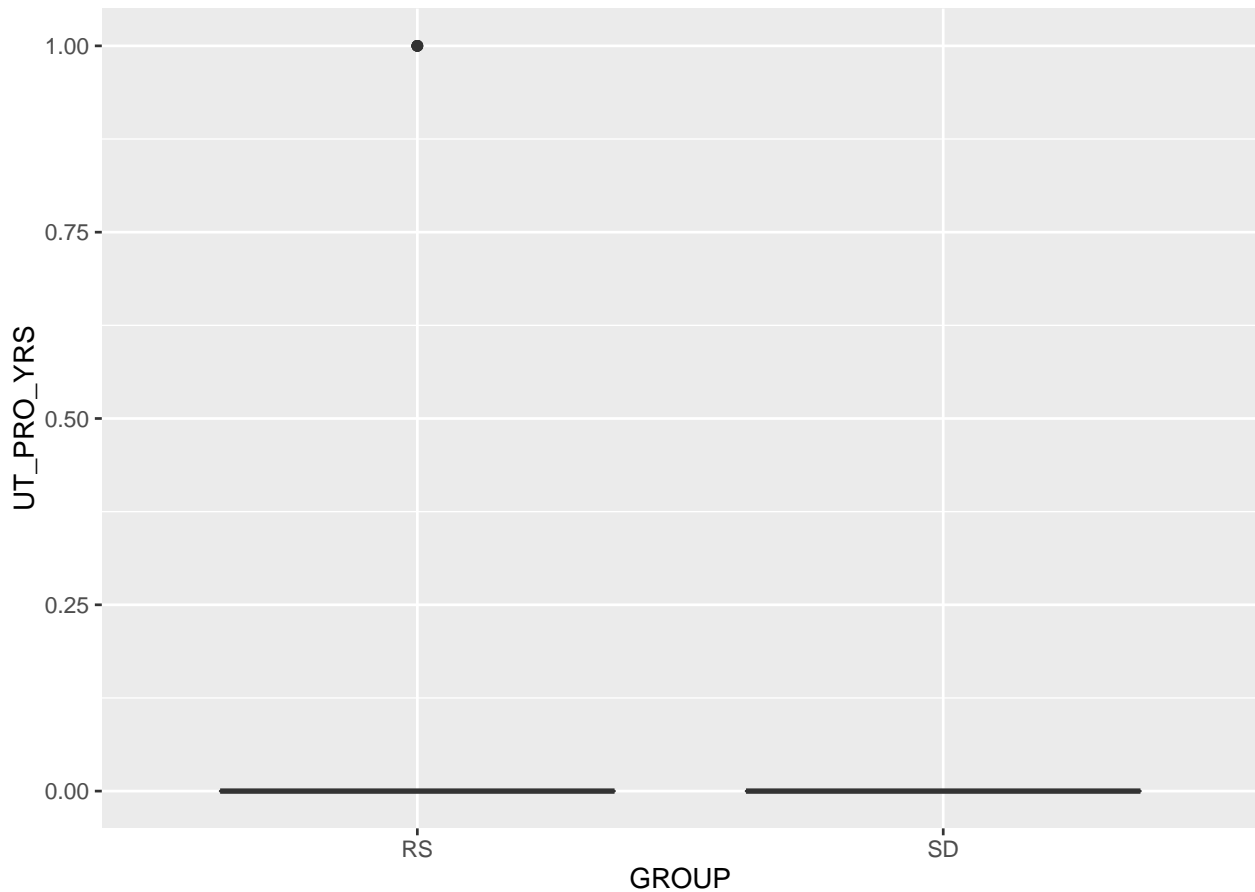
```
pander(ks.test(na.omit(sleep[GROUP=="SD",]$UT_ACM_YRS), na.omit(sleep[GROUP=="RS",]$UT_ACM_YRS)))
```

Table 40: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$UT_ACM_YRS) and
na.omit(sleep[GROUP == "RS",]\$UT_ACM_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.3303 | 0.2849 | two-sided |

Professional

```
ggplot(na.omit(sleep), aes(x=GROUP, y=UT_PRO_YRS)) + geom_boxplot()
```



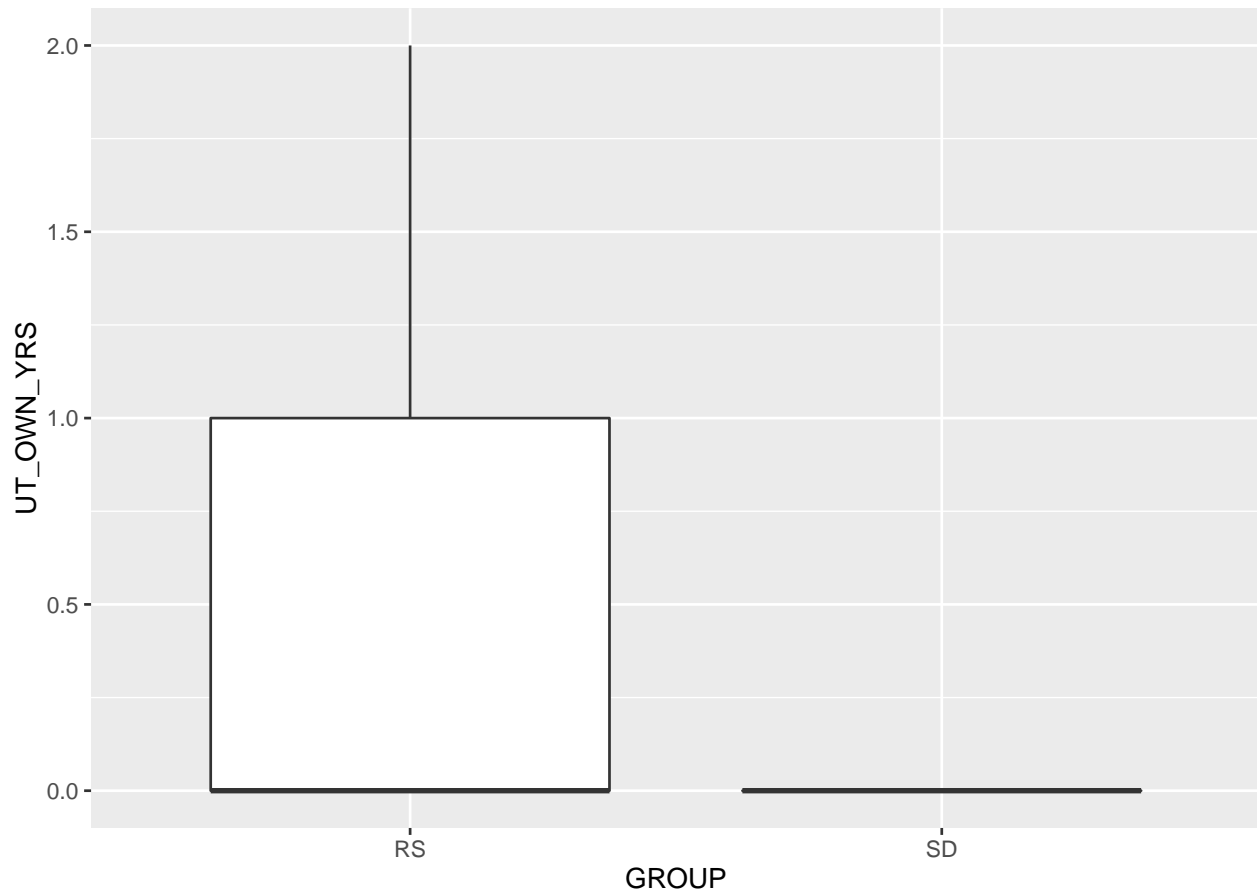
```
pander(ks.test(na.omit(sleep[GROUP=="SD",]$UT_PRO_YRS), na.omit(sleep[GROUP=="RS",]$UT_PRO_YRS)))
```

Table 41: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$UT_PRO_YRS) and
na.omit(sleep[GROUP == "RS",]\$UT_PRO_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.1152 | 0.9998 | two-sided |

Own projects

```
ggplot(na.omit(sleep), aes(x=GROUP, y=UT_OWN_YRS)) + geom_boxplot()
```

```
pander(ks.test(na.omit(sleep[GROUP=='SD'],]$UT_OWN_YRS), na.omit(sleep[GROUP=='RS'],]$DEV_OWN_YRS)))
```

Table 42: Two-sample Kolmogorov-Smirnov test:
na.omit(sleep[GROUP == "SD",]\$UT_OWN_YRS) and
na.omit(sleep[GROUP == "RS",]\$DEV_OWN_YRS)

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.3424 | 0.2465 | two-sided |

There is not evidence that make us suspect a difference in terms of years of unit testing development between the two groups.

Eclipse IDE

```
pander(table(GROUP, IDE_GENERAL))
```

Table 43: Table continues below

| | Intermediate (5-<=10 years) | No experience (<2 years) |
|-----------|-----------------------------|--------------------------|
| RS | 2 | 15 |
| SD | 0 | 13 |

| Novice (2-<=5 years) | |
|----------------------|---|
| RS | 5 |
| SD | 2 |

It appears that the SD subjects have no experience regarding the IDE (e.g., 21 v. 14) (*experienced* and *very experienced* have no subjects in both groups, therefore are not reported).

```
pander(kruskal.test(IDE_GENERAL~GROUP, data=na.omit(sleep)))
```

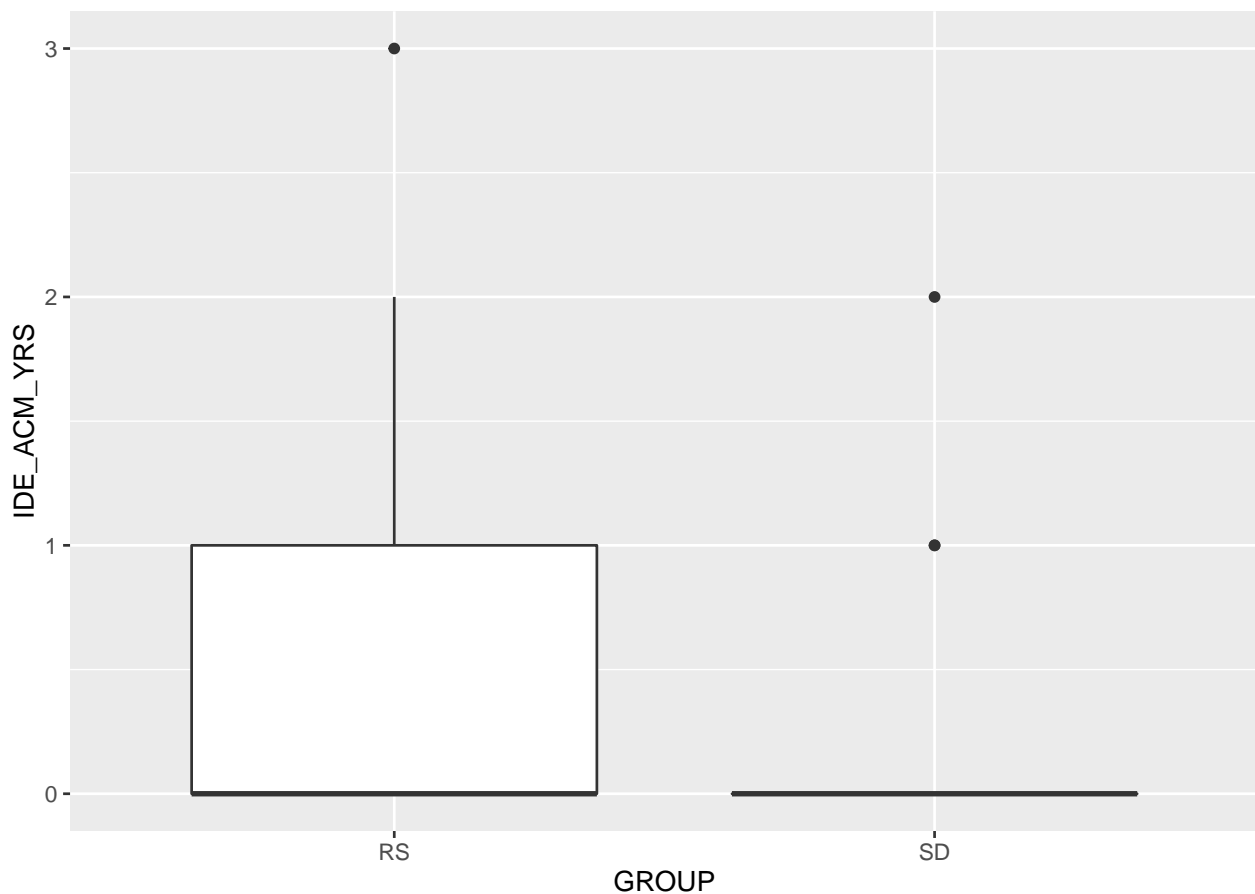
Table 45: Kruskal-Wallis rank sum test: IDE_GENERAL by GROUP

| Test statistic | df | P value |
|----------------|----|---------|
| 0.05737 | 1 | 0.8107 |

Using Kruskal-Wallis test it seems that there is **no evidence** the DEV experience come from different populations.

Academic

```
ggplot(na.omit(sleep), aes(x=GROUP, y=IDE_ACM_YRS)) + geom_boxplot()
```



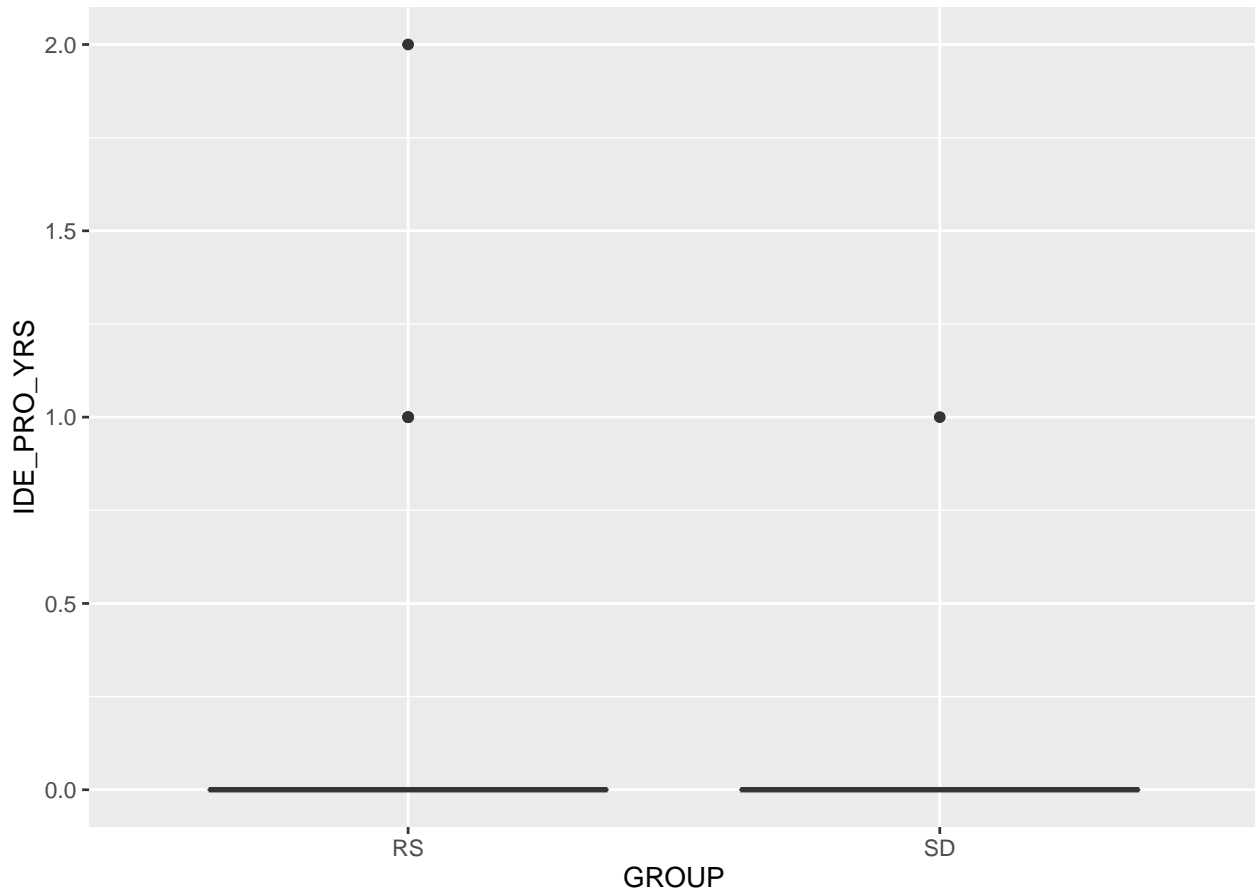
```
pander(ks.test(na.omit(sleep[GROUP=='SD'],]$IDE_ACM_YRS), na.omit(sleep[GROUP=='RS'],]$IDE_ACM_YRS)))
```

Table 46: Two-sample Kolmogorov-Smirnov test:
`na.omit(sleep[GROUP == "SD",]$IDE_ACM_YRS)` and
`na.omit(sleep[GROUP == "RS",]$IDE_ACM_YRS)`

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.2091 | 0.8304 | two-sided |

Professional

```
ggplot(na.omit(sleep), aes(x=GROUP, y=IDE_PRO_YRS)) + geom_boxplot()
```



```
pander(ks.test(na.omit(sleep[GROUP=="SD", ]$IDE_PRO_YRS), na.omit(sleep[GROUP=="RS", ]$IDE_PRO_YRS)))
```

Table 47: Two-sample Kolmogorov-Smirnov test:
`na.omit(sleep[GROUP == "SD",]$IDE_PRO_YRS)` and
`na.omit(sleep[GROUP == "RS",]$IDE_PRO_YRS)`

| Test statistic | P value | Alternative hypothesis |
|----------------|---------|------------------------|
| 0.1606 | 0.9755 | two-sided |

Own projects

Box plot showing the distribution of IDE_OWN_YRS (Y-axis) across two groups: RS and SD (X-axis). The Y-axis ranges from 0 to 3. The RS group shows a median of 0, with the interquartile range (IQR) spanning from 0 to 0.5. The SD group shows a median of 0, with the IQR spanning from 0 to 0. Both groups have whiskers extending to 0 and 0. Outliers are present for both groups at 2 and 3.

| GROUP | Median | Q1 | Q3 | Min | Max | Outliers |
|-------|--------|----|-----|-----|-----|----------|
| RS | 0 | 0 | 0.5 | 0 | 1 | 2, 3 |
| SD | 0 | 0 | 0 | 0 | 0 | 2, 3 |

| | | | |
|---|------------|--------------------|-------|
| Table 48: | Two-sample | Kolmogorov-Smirnov | test: |
| <code>na.omit(sleep[GROUP == "SD",]\$IDE Own_YRS)</code> | | | and |
| <code>na.omit(sleep[GROUP == "RS",]\$DEV Own_YRS)</code> | | | |

There is not evidence that make us suspect a difference in terms of years of use of Eclipse IDE between the two groups.