Data Visualization using GGally

Data Visualization in R

```
suppressWarnings(library(tidyverse))
```

```
## ── Attaching packages ─────────────────────────────────────── tidyverse 1.3.1 ──
```

```
## ✓ ggplot2 3.4.0      ✓ purrr   0.3.4
## ✓ tibble  3.1.7      ✓ dplyr   1.0.10
## ✓ tidyr   1.2.0      ✓ stringr 1.4.1
## ✓ readr   2.1.2      ✓ forcats 0.5.2
```

```
## ── Conflicts ────────────────────────────────────────── tidyverse_conflicts() ──
## ✕ dplyr::filter() masks stats::filter()
## ✕ dplyr::lag()    masks stats::lag()
```

```
suppressWarnings(library(GGally))
```

```
## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg   ggplot2
```

```
data <- read.csv(file = 'CaseStudy11_TBI.csv')
head(data)
```

	id	a...	sex	mechanism	field0gcs	er0gcs	icu0gcs	worst0gcs	X6m0gose
	<int>	<int>	<chr>	<chr>	<int>	<int>	<int>	<int>	<int>
1	1	19	Male	Fall	10	10	10	10	5
2	2	55	Male	Blunt	0	3	3	3	5
3	3	24	Male	Fall	12	12	8	8	7
4	4	57	Female	Fall	4	4	6	4	3
5	5	54	Female	Peds_vs_Auto	14	11	8	8	5
6	6	16	Female	MVA	13	7	7	7	7

6 rows | 1-10 of 20 columns

Q1: Creating a correlation plot to know If worst.GCS (worst Glasgow Coma Scale Score) significantly correlated with 6m.gose (GCS at 6 month follow-up)?

```
data_1 <- data %>% subset(select = c("worst0gcs", "X6m0gose" , "sex"))
head(data_1)
```

	worst0gcs <int>	X6m0gose <int>	sex <chr>
1	10	5	Male
2	3	5	Male
3	8	7	Male
4	4	3	Female
5	8	5	Female
6	7	7	Female

6 rows

```
ggpairs(data_1, ggplot2::aes(colour=sex))
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
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```
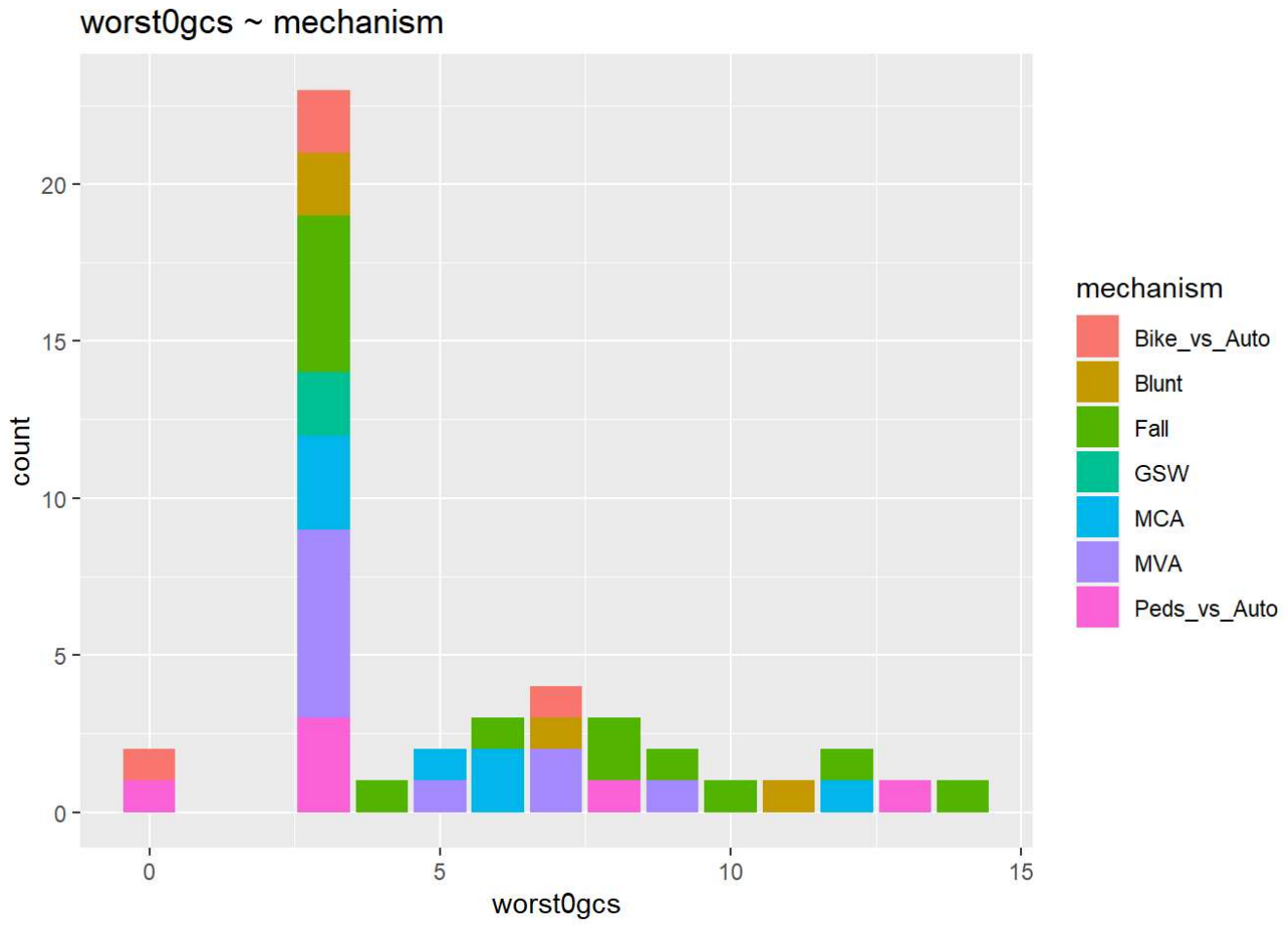

The plot above shows a weak correlation with coefficient 0.194, between worst GCS(glassgow coma scale score) and 6m.gose(glassgow outcome scale), as per the sex the males are having moderate correlation and females are having negative correlation with respect to X6m0gose

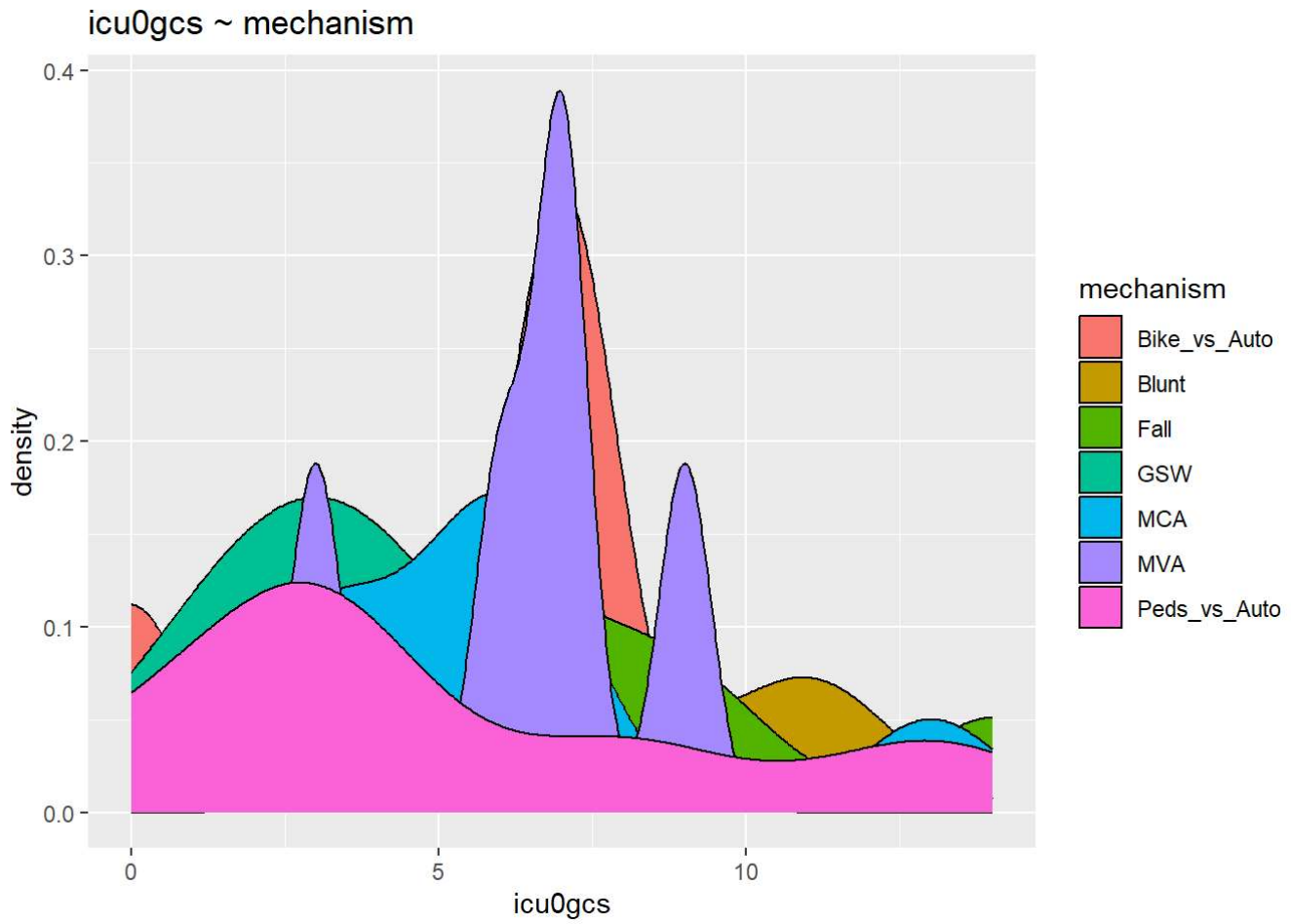
Q2: Are different mechanisms of injury significantly correlated with higher or lower GCS scores?

Below four plots compare the different mechanisms of injury with GCS scores

```
ggplot(data) +
 geom_bar(aes(x = worst0gcs, fill = mechanism)) +
 labs(x = 'worst0gcs') +
 ggtitle("worst0gcs ~ mechanism ")
```

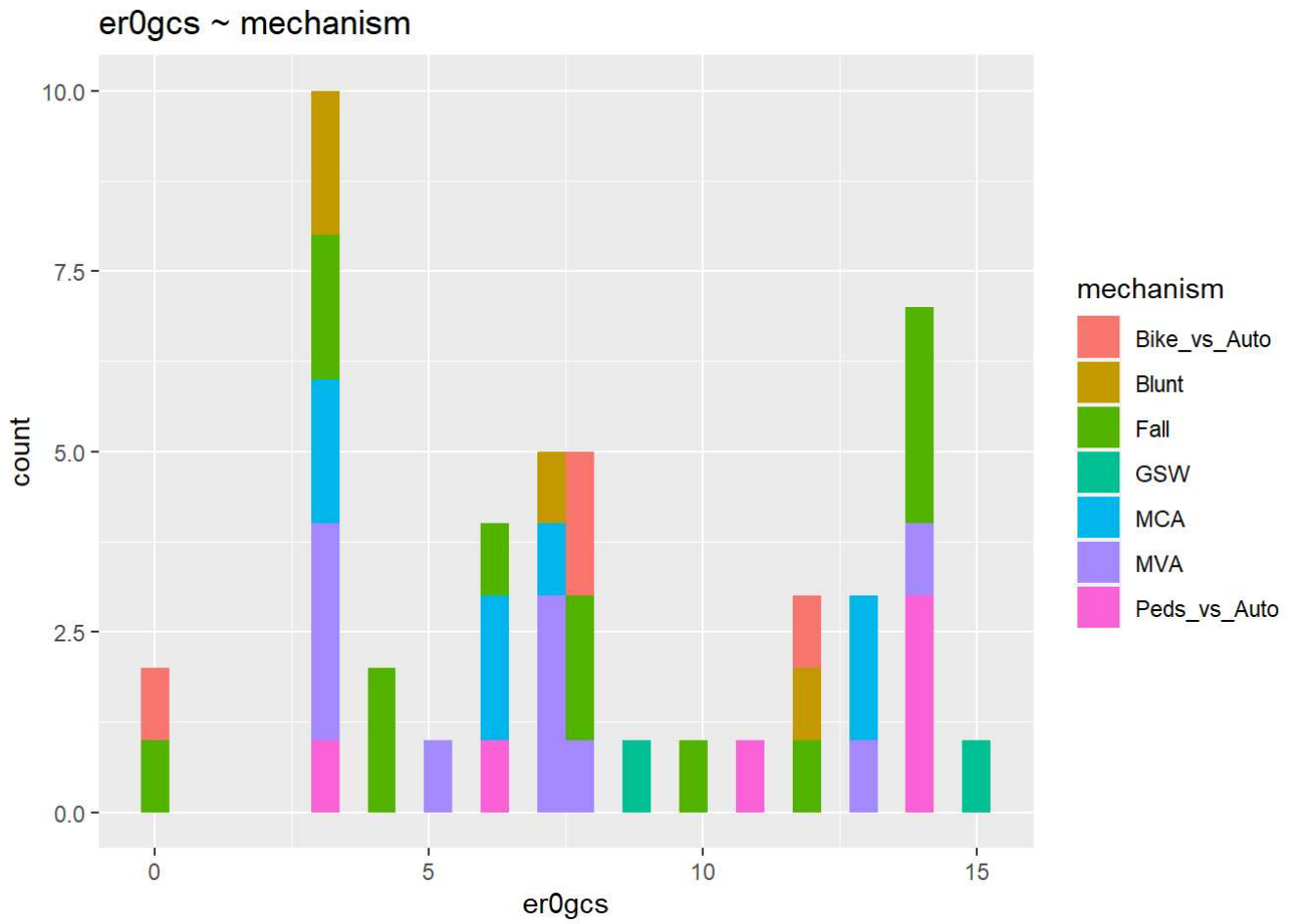



```
ggplot(data) +
 geom_density(aes(x = icu0gcs, fill = mechanism)) +
 labs(x = 'icu0gcs') +
 ggtitle("icu0gcs ~ mechanism ")
```

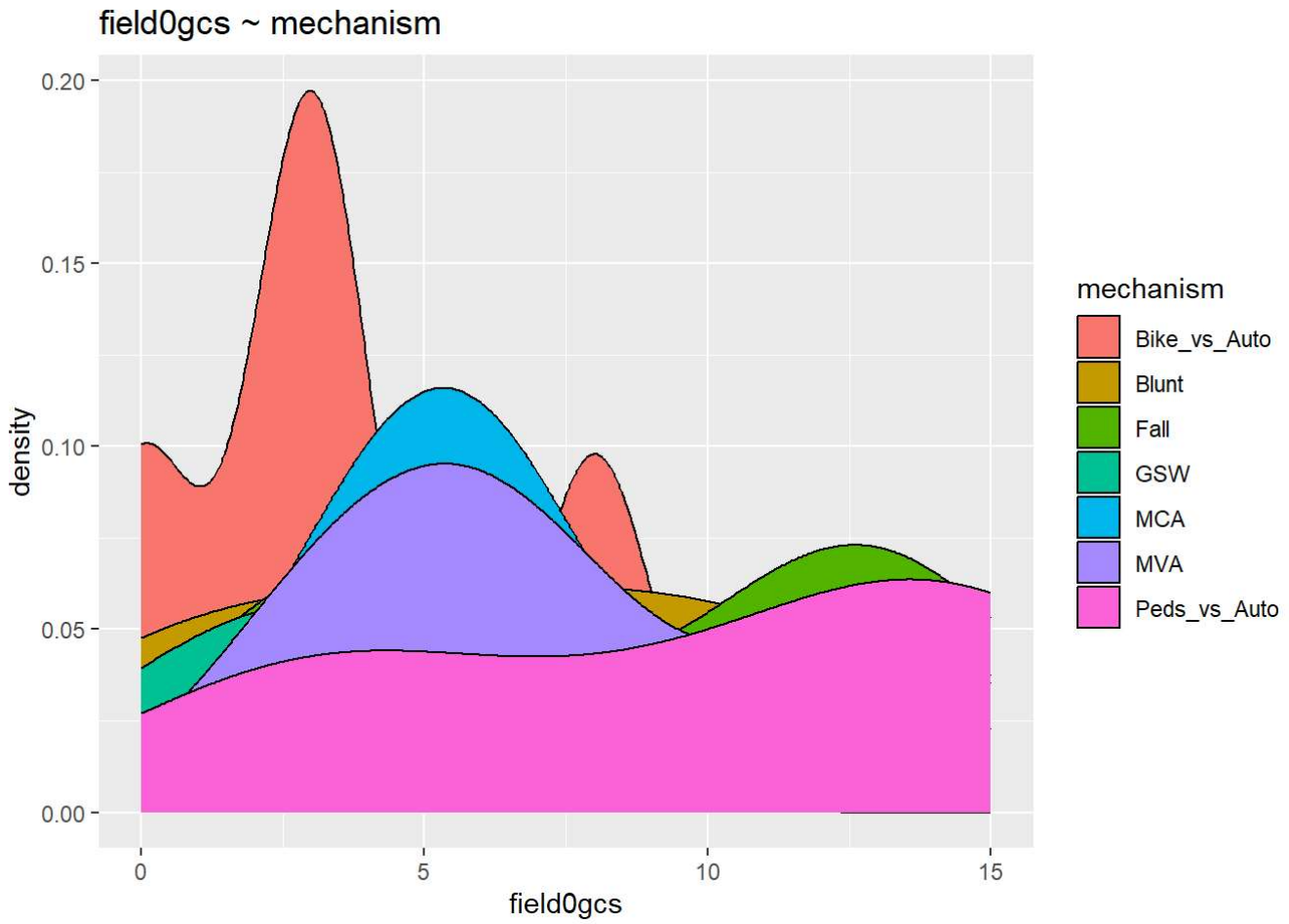



```
ggplot(data) +
 geom_histogram(aes(x = er0gcs, fill = mechanism)) +
labs(x = 'er0gcs') +
 ggtitle("er0gcs ~ mechanism ")
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```




```
ggplot(data) +
 geom_density(aes(x = field0gcs, fill = mechanism)) +
 labs(x = 'field0gcs') +
 ggtitle("field0gcs ~ mechanism ")
```



All the four plots above conclude that different mechanisms of injury significantly correlated with lower GCS scores

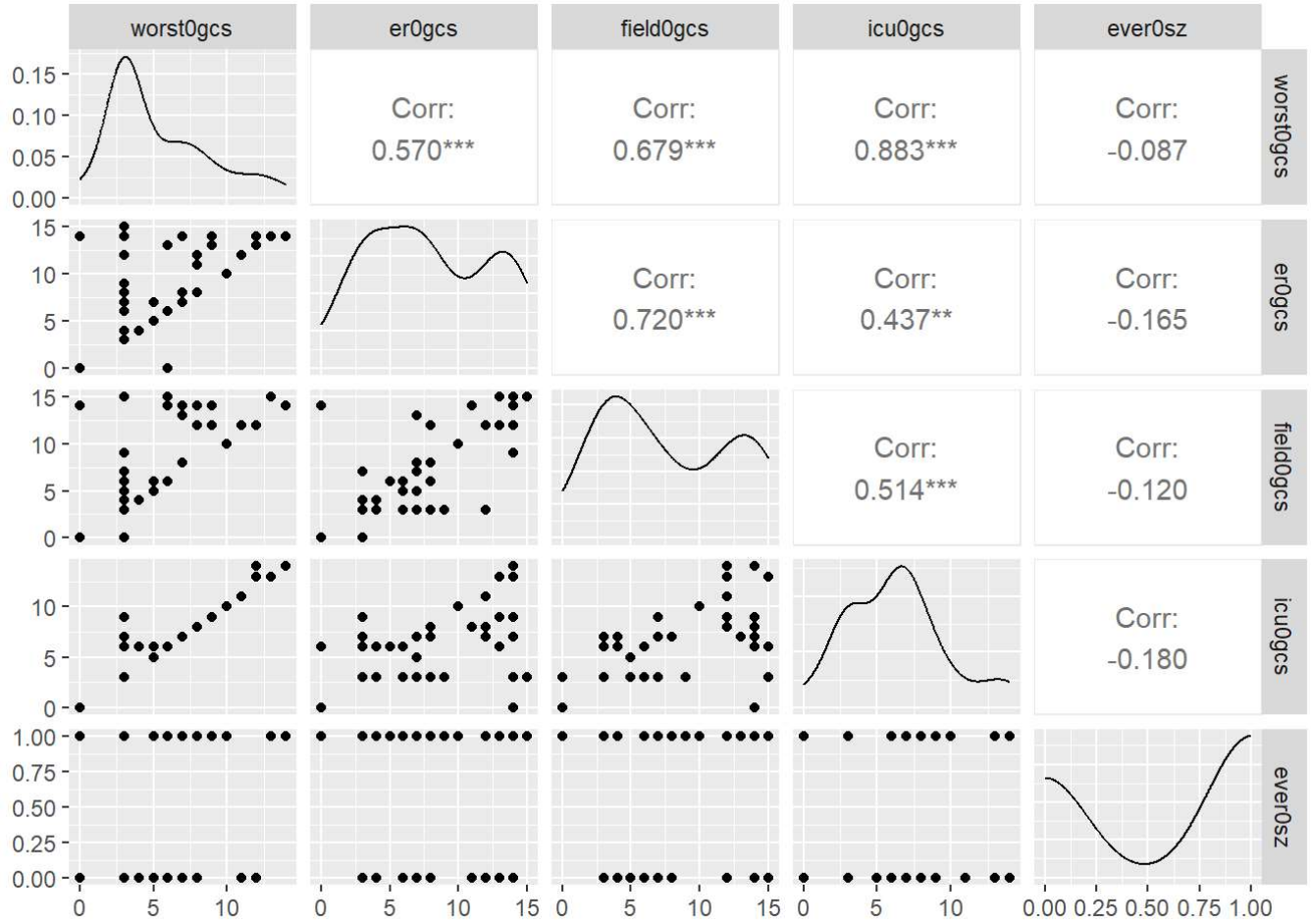
Q3: Are GCS scores significantly correlated with seizures at any time (ever.sz)?

```
data_2 <- data %>%
 subset(select = c("worst0gcs", "er0gcs", "field0gcs", "icu0gcs", "ever0sz"))
head(data_2)
```

	worst0gcs <int>	er0gcs <int>	field0gcs <int>	icu0gcs <int>	ever0sz <int>
1	10	10	10	10	1
2	3	3	0	3	1
3	8	12	12	8	0
4	4	4	4	6	0
5	8	11	14	8	0
6	7	7	13	7	1

6 rows

```
ggpairs(data_2)
```



The above plots show GCS scores are negatively correlated with seizures at any time.