Computational Statistics - HW 1

Overview

In this 30 min session you will:

- Load and inspect the `knn_s3` and `knn_s3_formula` scripts
- Fit k-NN regression models using S3
- Use `print()`, `summary()`, `fitted()`, `predict()`, `anova()`

Setup

Download the scripts:

```
curl -O https://raw.githubusercontent.com/mmadoliat/WSoRT/refs/heads/main/R/knn_s3.R
curl -O https://raw.githubusercontent.com/mmadoliat/WSoRT/refs/heads/main/R/knn_s3_formula.R
```

Source them in your R console:

```
source("knn_s3.R")
source("knn_s3_formula.R")
```

Example Code

```r
# Fit two models
mod5  <- knn_s3(mpg ~ disp + hp + wt, mtcars, k = 5)
mod10 <- knn_s3(mpg ~ disp + hp + wt, mtcars, k = 10)

# Inspect models
print(mod5)
summary(mod5)
fitted(mod5)[1:5]

# Compare models
anova(mod5, mod10)
```

Tasks

1. **Vary k**: change `k` to 3 and 8, then re-run `summary()`.
2. **Backend swap**: use `predict(mod5, head(mtcars), method="R")` and compare.
3. **New predictor**: fit a model with `mpg ~ cyl + gear` and compare with the first via `anova()`.

Good luck!