00_Toy_Examples

Frances Lin

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Load packages

```
library(INLA)
```

```
## Loading required package: Matrix
```

```
## Loading required package: foreach
```

```
## Loading required package: parallel
```

```
## Loading required package: sp
```

```
## This is INLA_22.03.16 built 2022-03-16 13:24:07 UTC.
##  - See www.r-inla.org/contact-us for how to get help.
```

Simulate the data

```
N <- 100 # 500, 5000, 25000, 100000
x <- rnorm(N, mean = 6, sd = 2)
y <- rnorm(N, mean = x, sd = 1)
data <- list(x = x, y = y, N = N)
```

Fit a SLR model

```
# Measure running time of code
# https://www.r-bloggers.com/2017/05/5-ways-to-measure-running-time-of-r-code/
sleep_for_a_minute <- function() {Sys.sleep(60)}
start_time <- Sys.time()

# Fit a SLR model
model <- inla(y ~ x,
  family = "gaussian",
  data = data,
  control.predictor = list(link = 1)
```

```
)

end_time <- Sys.time()
end_time - start_time
```

```
## Time difference of 2.995074 secs
```

Produce results

```
summary(model)
```

```
##
## Call:
##    c("inla.core(formula = formula, family = family, contrasts = contrasts,
##    ", " data = data, quantiles = quantiles, E = E, offset = offset, ", "
##    scale = scale, weights = weights, Ntrials = Ntrials, strata = strata,
##    ", " lp.scale = lp.scale, link.covariates = link.covariates, verbose =
##    verbose, ", " lincomb = lincomb, selection = selection, control.compute
##    = control.compute, ", " control.predictor = control.predictor,
##    control.family = control.family, ", " control.inla = control.inla,
##    control.fixed = control.fixed, ", " control.mode = control.mode,
##    control.expert = control.expert, ", " control.hazard = control.hazard,
##    control.lincomb = control.lincomb, ", " control.update =
##    control.update, control.lp.scale = control.lp.scale, ", "
##    control.pardiso = control.pardiso, only.hyperparam = only.hyperparam,
##    ", " inla.call = inla.call, inla.arg = inla.arg, num.threads =
##    num.threads, ", " blas.num.threads = blas.num.threads, keep = keep,
##    working.directory = working.directory, ", " silent = silent, inla.mode
##    = inla.mode, safe = FALSE, debug = debug, ", " .parent.frame =
##    .parent.frame)")
## Time used:
##     Pre = 2.54, Running = 0.248, Post = 0.0206, Total = 2.81
## Fixed effects:
##               mean    sd 0.025quant 0.5quant 0.975quant   mode kld
## (Intercept) -0.198 0.298     -0.784   -0.198      0.388 -0.198   0
## x            1.037 0.050      0.938    1.037      1.135  1.037   0
##
## Model hyperparameters:
##                                          mean    sd 0.025quant 0.5quant
## Precision for the Gaussian observations 1.06 0.149      0.785     1.05
##                                         0.975quant mode
## Precision for the Gaussian observations       1.37 1.04
##
## Marginal log-Likelihood:  -157.88
##  is computed
## Posterior summaries for the linear predictor and the fitted values are computed
## (Posterior marginals needs also 'control.compute=list(return.marginals.predictor=TRUE)')
```

Reference

Morrison, K. (2017). A gentle INLA tutorial. Precision Analytics. https://www.precision-analytics.ca/articles/a-gentle-inla-tutorial/.