Advanced Machine Learning

Lab 4

Rasmus Holm

2017-10-05

Assignment 1

```r
sample_transition_component <- function() {
    sample(1:3, size=1, prob=rep(1, 3) / 3)
}

sample_emission_component <- function() {
    sample(1:3, size=1, prob=rep(1, 3) / 3)
}

sample_initial_state <- function() {
    runif(1, 0, 100)
}

sample_transition <- function(z) {
    component <- sample_transition_component()
    mu <- ifelse(component == 1, z, ifelse(component == 2, z + 1, z + 2))
    sigma <- 1
    rnorm(1, mean=mu, sd=sigma)
}

sample_emission <- function(z) {
    component <- sample_emission_component()
    mu <- ifelse(component == 1, z, ifelse(component == 2, z - 1, z + 1))
    sigma <- 1
    rnorm(1, mean=mu, sd=sigma)
}
```

```r
n <- 100
states <- rep(0, n)
emissions <- rep(0, n)

initial_state <- sample_initial_state()
current_state <- initial_state

for (i in 1:n) {
    current_emission <- sample_emission(current_state)

    states[i] <- current_state
    emissions[i] <- current_emission

    current_state <- sample_transition(current_state)
}
```

```
plot(states, type="l")
lines(emissions, col="red")
```