HW2 Solution

IE384 Simulation Models in IE

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Information:

- 5 stalls
- Taxis arrive at 8/hr
- Customers arrive at 10/hr
- Customers leave if there's no taxis

```
library(tidyverse)
library(knitr)
library(simmer)
library(simmer.bricks)
library(simmer.plot)
```

```
n_stalls <- 5

taxis_arrival <- function(n=1) {
  rexp(n, rate = 8)
}

cust_arrival <- function(n=1) {
  rexp(n, rate = 10)
}
```

```
sim <- simmer("taxi stand") |>
                # this is where people load
  add_resource("stall", capacity = 1, queue_size = n_stalls - 1)

taxi_traj <- trajectory() |>
  seize("stall", 1) |>
```

```
  timeout(cust_arrival) |>
  release("stall", 1)

sim |>
  add_generator("taxi", taxi_traj, taxis_arrival)
```

```
simmer environment: taxi stand | now: 0 | next: 0
{ Monitor: in memory }
{ Resource: stall | monitored: TRUE | server status: 0(1) | queue status: 0(4) }
{ Source: taxi | monitored: 1 | n_generated: 0 }
```

```
sim_time <- 72

reset(sim) |> run(sim_time)
```

```
simmer environment: taxi stand | now: 72 | next: 72.0740683745618
{ Monitor: in memory }
{ Resource: stall | monitored: TRUE | server status: 0(1) | queue status: 0(4) }
{ Source: taxi | monitored: 1 | n_generated: 560 }
```

```
taxistalls <- get_mon_resources(sim)
taxis <- get_mon_arrivals(sim)
```

```
plot(taxistalls, steps = TRUE, items = "system") #, steps = TRUE) #, items = "queue")
```

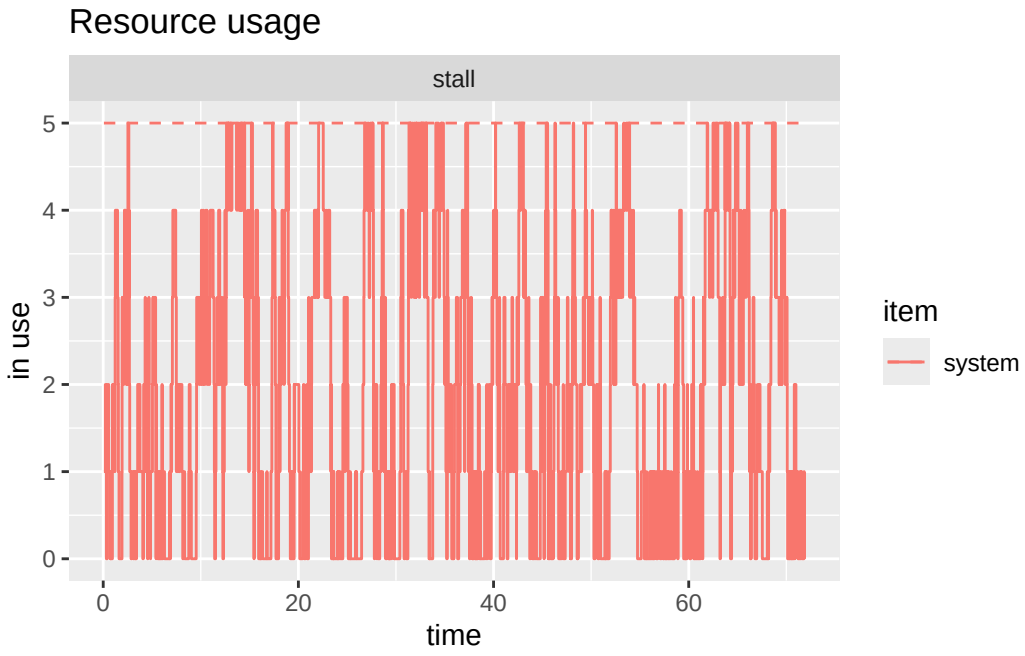
Resource usage
stall
in use
time
0
20
40
60
0
1
2
3
4
5
item
system

Figure 1