00_proc_Counting

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```
library(tidyverse)
library(ggplot2)
library(patchwork)
```

```
# Create data
X = c(0.1, 1, 1.5, 3, 5, 8, 9.5, 10)
```

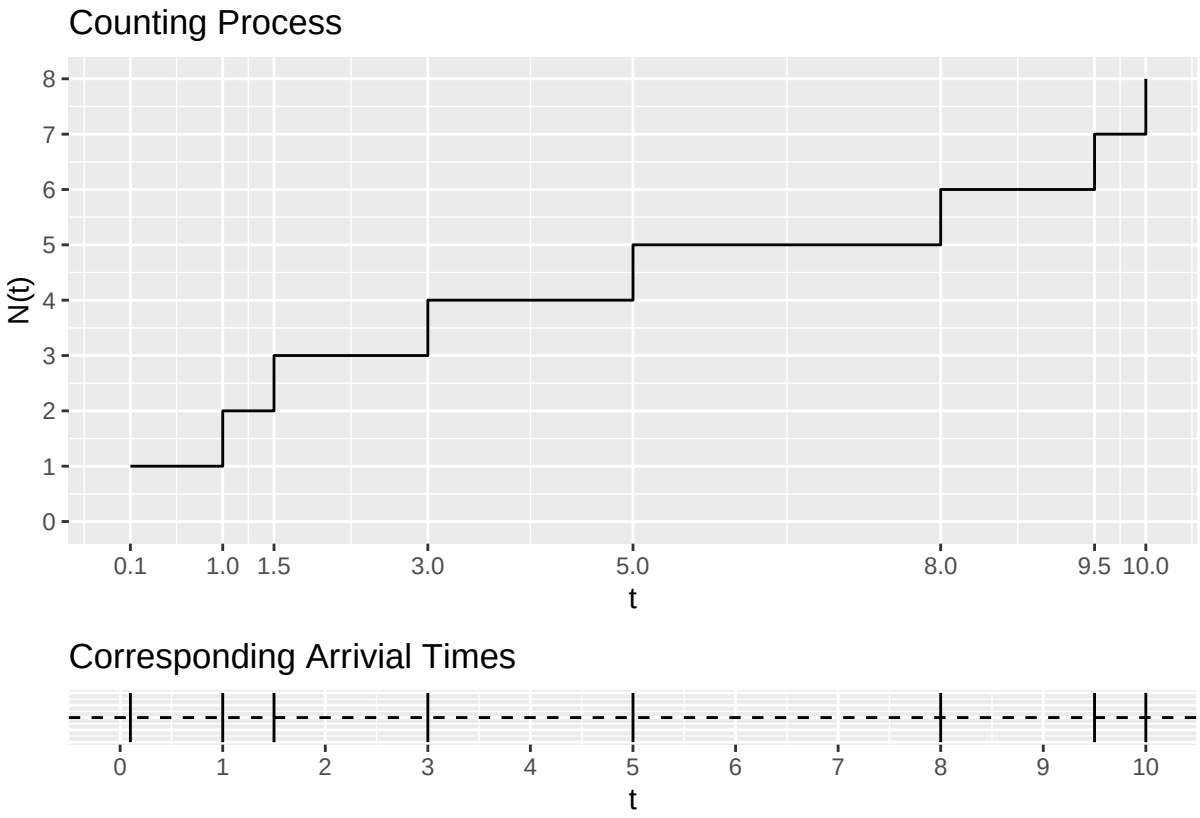
```
# Create dataframes
df_Counting = tibble(
  x = X,
  y = 1:(length(X)) #0:(length(X) - 1)
)

# # Can probably delete
# df_Counting <- df_Counting %>% add_column(
#   t_fix = c(0, rep(2, length(df_Counting$x) - 1)) # so that no point at t = 0
#   #t_fix = rep(2, length(df_HPP$x))
# )
```

```
# Plot Counting Process
p_Counting <- ggplot(data=df_Counting, mapping=aes(x=x, y=y)) +
  geom_step() +
  labs(title = "Counting Process",
       x = "t",
       y = "N(t)") +
  scale_x_continuous(limits = c(0, 10), breaks = df_Counting$x) +
  scale_y_continuous(limits = c(0, length(df_Counting$x)), breaks = seq(0, 10, by = 1))
#p_Counting
```

```
# Plot Corresponding Arrivial Times
p_Counting_time <- ggplot(data=df_Counting, mapping=aes(x=x, ymin = -0.5, ymax = 0.5)) +
  geom_linerange() +
  geom_hline(aes(yintercept = 0), linetype = "dashed") +
  labs(title = "Corresponding Arrivial Times",
       x = "t",
       y = "") +
  scale_x_continuous(limits = c(0, 10), breaks = seq(0, 10, by = 1)) +
  theme(axis.text.y=element_blank(), axis.ticks.y=element_blank())
#p_Counting_time
```

```
# Combine plots
# require(gridExtra)
# grid.arrange(p_Counting, p_Counting_time)
p_Counting / p_Counting_time + plot_layout(heights = c(0.9, 0.1))
```




```
# Save output and adjust size
png(file = '/Users/franceslinyc/Hawkes-Process-2021/results/plot_1D_Counting.png', width = 450*2, heigh
p_Counting / p_Counting_time + plot_layout(heights = c(0.9, 0.1))
```