Tut8

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```r
root_url<- "https://api.data.gov.sg/v1/transport/taxi-availability"

dt1<-as.POSIXct("2021-01-10 09:00:00")
dt2<-as.POSIXct("2021-01-17 09:00:00")
#Qn1
get_taxi_data <- function(dt) {
  final_url <- paste0('https://api.data.gov.sg/v1/transport/taxi-availability?date_time=',format(dt,"%Y-%m-%dT%
H:%M:%S"))
  taxi_data <- fromJSON(final_url)
  class(taxi_data)<-"taxi_json"
  return(taxi_data)
}

wet_day_locs<-get_taxi_data(dt1)
dry_day_locs<-get_taxi_data(dt2)

#Qn2
summary.taxi_json<- function(x) {
  tcount<- x$features$properties$taxi_count
  tstamp<-as.POSIXct(x$features$properties$timestamp)
  p1<-paste("Taxi count: ", tcount, '\n')
  cat(p1)
  p2<-paste("Actual timestamp: ", tstamp)
  cat(p2)
}

#converting to simple feature
as.data.frame.taxi_json<- function(z) {
  t_coords<- as.data.frame(z$features$geometry$coordinates[[1]])
  coord_sf<-st_as_sf(t_coords, coords = c(1,2))
  st_crs(coord_sf)<-4326
  coord_sf<-st_transform(coord_sf, 3414)
  return(coord_sf)
}

wet<-as.data.frame.taxi_json(wet_day_locs)
dry<-as.data.frame.taxi_json(dry_day_locs)

#Qn3: planning areas
pln_areas<- readRDS("../data/sg_planning_areas.rds")
pln2<-st_transform(pln_areas,4326)
pln2<-st_zm(pln2)

#Qn 4: Counts
#wet count
pln_wet_count<-st_contains(pln_areas, wet)
pln_wet_count<-sapply(pln_wet_count, length)
pln_areas$wet_count<-pln_wet_count

#dry count
pln_dry_count<-st_contains(pln_areas, dry)
pln_dry_count<-sapply(pln_dry_count, length)
pln_areas$dry_count<-pln_dry_count
```
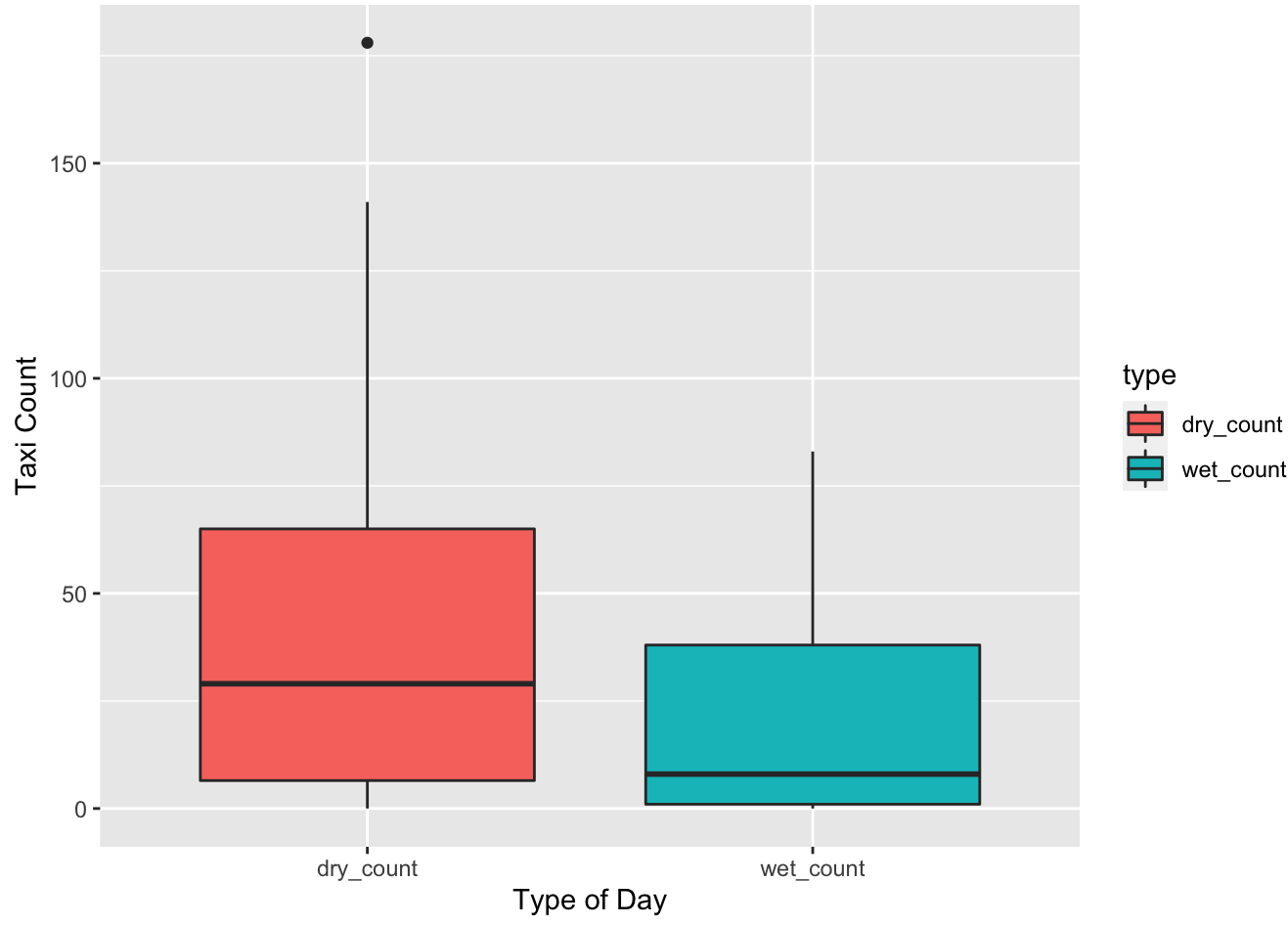
```r
pln2<-pln_areas %>%
  select(PLN_AREA_N, wet_count, dry_count)%>%
  pivot_longer(2:3,names_to = "type", values_to = "count")

#Qn1
pln2 %>%
  ggplot() +
  geom_boxplot(mapping=aes(x=type, y=count, fill=type))+
  labs(x="Type of Day", y="Taxi Count")
```



```r
pln2%>%
  ggplot() +
  geom_col(mapping=aes(x=PLN_AREA_N, y=count, fill=type))+
  facet_wrap(~ type, ncol=2,
             labeller=as_labeller(c(`dry_count`="Taxi Count on Dry Day",
                                    `wet_count`="Taxi Count on Wet Day")))+
  coord_flip()+
  labs(x="Planning Area", y="Taxi Count")+
  theme(axis.text.y = element_text(size = 7))
```
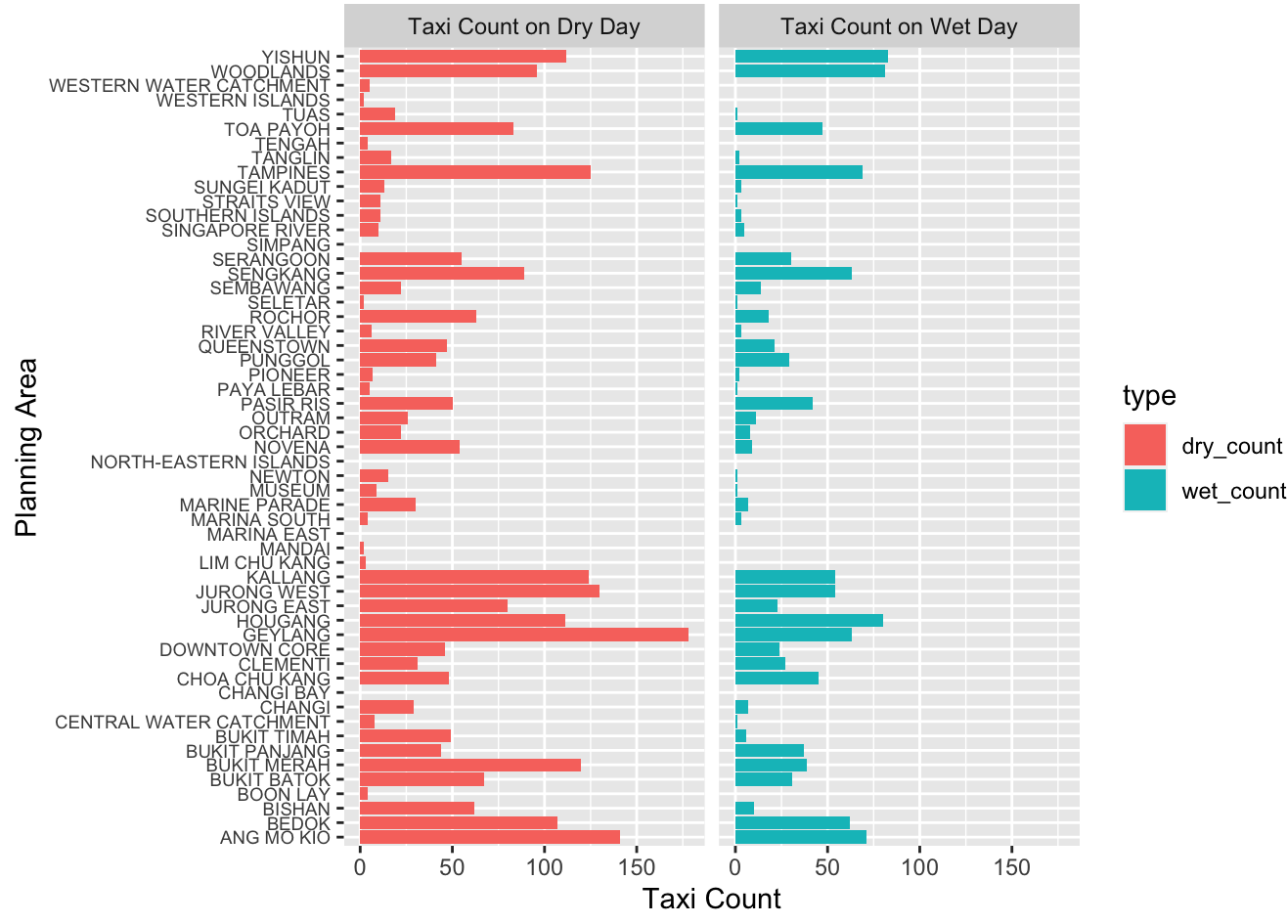


```r
#Qn2
pln3<-pln_areas %>%
  select(PLN_AREA_N, wet_count, dry_count)%>%
  mutate(area=factor(PLN_AREA_N, levels=PLN_AREA_N[order(wet_count)]))

pln3 %>%
  ggplot() +
  geom_point(mapping=aes(x=wet_count, y=area), color="blue")+
  geom_point(mapping=aes(x=dry_count, y=area),color="red")+
  geom_segment(mapping=aes(x=wet_count,xend=dry_count, y=area, yend=area))+
  labs(x="Taxi Count", y="Planning area")+
  geom_point(mapping=aes(x=150, y="WESTERN WATER CATCHMENT"), color="blue")+
  geom_point(mapping=aes(x=160, y="WESTERN WATER CATCHMENT"), color="red")+
  geom_segment(mapping=aes(x=150,xend=160, y="WESTERN WATER CATCHMENT", yend="WESTERN WATER CATCHMENT"))+
  geom_text(mapping=aes(x=147, y="WESTERN WATER CATCHMENT", label="Wet count"), hjust="right", nudge_x=0.1, size=
2.5)+
  geom_text(mapping=aes(x=162, y="WESTERN WATER CATCHMENT", label="Dry count"), hjust="left", nudge_x=0.1, size=
2.5)+
  theme(axis.text.y = element_text(size = 7))
```