

Assignment_Block3

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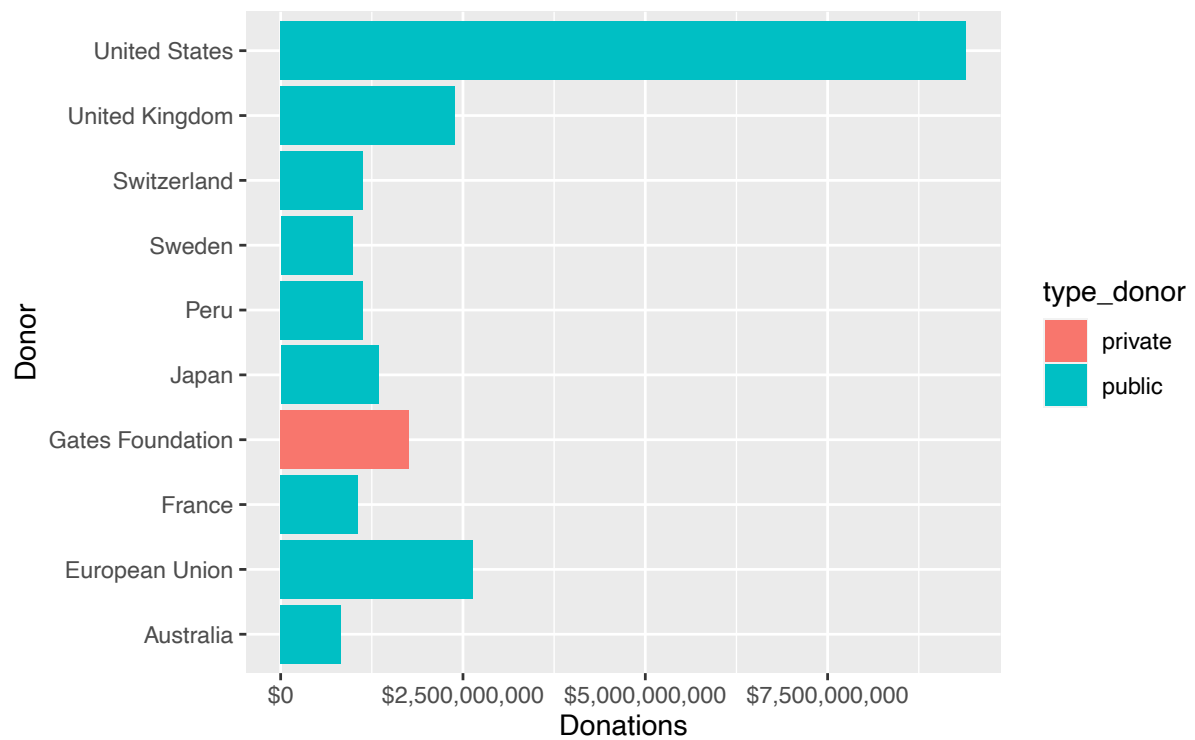
#ASSIGNMENT BLOCK 3

##Solution 1

```
io_income_rs %>%  
  drop_na(donor) %>% # Drops all NA observations in donor  
  group_by(donor, type_donor) %>%  
  summarise(total_amount_nominal = sum(amount_nominal), na.rm = TRUE) %>%  
  arrange(-total_amount_nominal) %>%  
  ungroup() %>%  
  slice(1:10) %>% # Slices for top 10  
  ggplot(mapping=aes(x = donor, y = total_amount_nominal, fill= type_donor)) + # Plots data for Donors  
  geom_col() +  
  scale_y_continuous(labels = scales::dollar) + # Changes scale of axis Y to USD  
  labs(title = "The Top 10 Donors from 2000 to 2021",  
        x = "Donor",  
        y = "Donations",  
        caption = "Source: IO_Income_RS") +  
  coord_flip() # Changes angle of the plot
```

```
## 'summarise()' has grouped output by 'donor'. You can override using the  
## '.groups' argument.
```

The Top 10 Donors from 2000 to 2021



Source: IO_Income_RS

```
theme_minimal()
```

```
## List of 93
## $ line :List of 6
## ..$ colour : chr "black"
## ..$ size : num 0.5
## ..$ linetype : num 1
## ..$ lineend : chr "butt"
## ..$ arrow : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ rect :List of 5
## ..$ fill : chr "white"
## ..$ colour : chr "black"
## ..$ size : num 0.5
## ..$ linetype : num 1
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ text :List of 11
## ..$ family : chr ""
## ..$ face : chr "plain"
## ..$ colour : chr "black"
## ..$ size : num 11
## ..$ hjust : num 0.5
## ..$ vjust : num 0.5
```

```

## ..$ angle      : num 0
## ..$ lineheight : num 0.9
## ..$ margin     : 'margin' num [1:4] 0points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug      : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ title        : NULL
## $ aspect.ratio : NULL
## $ axis.title    : NULL
## $ axis.title.x  :List of 11
## ..$ family     : NULL
## ..$ face       : NULL
## ..$ colour     : NULL
## ..$ size       : NULL
## ..$ hjust      : NULL
## ..$ vjust      : num 1
## ..$ angle      : NULL
## ..$ lineheight : NULL
## ..$ margin     : 'margin' num [1:4] 2.75points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug      : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.top :List of 11
## ..$ family     : NULL
## ..$ face       : NULL
## ..$ colour     : NULL
## ..$ size       : NULL
## ..$ hjust      : NULL
## ..$ vjust      : num 0
## ..$ angle      : NULL
## ..$ lineheight : NULL
## ..$ margin     : 'margin' num [1:4] 0points 0points 2.75points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug      : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.bottom : NULL
## $ axis.title.y        :List of 11
## ..$ family     : NULL
## ..$ face       : NULL
## ..$ colour     : NULL
## ..$ size       : NULL
## ..$ hjust      : NULL
## ..$ vjust      : num 1
## ..$ angle      : num 90
## ..$ lineheight : NULL
## ..$ margin     : 'margin' num [1:4] 0points 2.75points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug      : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.y.left : NULL

```

```

## $ axis.title.y.right      :List of 11
## ..$ family               : NULL
## ..$ face                 : NULL
## ..$ colour               : NULL
## ..$ size                 : NULL
## ..$ hjust                : NULL
## ..$ vjust                : num 0
## ..$ angle                : num -90
## ..$ lineheight           : NULL
## ..$ margin               : 'margin' num [1:4] 0points 0points 0points 2.75points
## ..- attr(*, "unit")= int 8
## ..$ debug                : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text               :List of 11
## ..$ family               : NULL
## ..$ face                 : NULL
## ..$ colour               : chr "grey30"
## ..$ size                 : 'rel' num 0.8
## ..$ hjust                : NULL
## ..$ vjust                : NULL
## ..$ angle                : NULL
## ..$ lineheight           : NULL
## ..$ margin               : NULL
## ..$ debug                : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x             :List of 11
## ..$ family               : NULL
## ..$ face                 : NULL
## ..$ colour               : NULL
## ..$ size                 : NULL
## ..$ hjust                : NULL
## ..$ vjust                : num 1
## ..$ angle                : NULL
## ..$ lineheight           : NULL
## ..$ margin               : 'margin' num [1:4] 2.2points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug                : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x.top         :List of 11
## ..$ family               : NULL
## ..$ face                 : NULL
## ..$ colour               : NULL
## ..$ size                 : NULL
## ..$ hjust                : NULL
## ..$ vjust                : num 0
## ..$ angle                : NULL
## ..$ lineheight           : NULL
## ..$ margin               : 'margin' num [1:4] 0points 0points 2.2points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug                : NULL
## ..$ inherit.blank: logi TRUE

```

```

## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x.bottom : NULL
## $ axis.text.y :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL
## ..$ size : NULL
## ..$ hjust : num 1
## ..$ vjust : NULL
## ..$ angle : NULL
## ..$ lineheight : NULL
## ..$ margin : 'margin' num [1:4] 0points 2.2points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.y.left : NULL
## $ axis.text.y.right :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL
## ..$ size : NULL
## ..$ hjust : num 0
## ..$ vjust : NULL
## ..$ angle : NULL
## ..$ lineheight : NULL
## ..$ margin : 'margin' num [1:4] 0points 0points 0points 2.2points
## ..- attr(*, "unit")= int 8
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.ticks : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ axis.ticks.x : NULL
## $ axis.ticks.x.top : NULL
## $ axis.ticks.x.bottom : NULL
## $ axis.ticks.y : NULL
## $ axis.ticks.y.left : NULL
## $ axis.ticks.y.right : NULL
## $ axis.ticks.length : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ axis.ticks.length.x : NULL
## $ axis.ticks.length.x.top : NULL
## $ axis.ticks.length.x.bottom: NULL
## $ axis.ticks.length.y : NULL
## $ axis.ticks.length.y.left : NULL
## $ axis.ticks.length.y.right : NULL
## $ axis.line : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ axis.line.x : NULL
## $ axis.line.x.top : NULL
## $ axis.line.x.bottom : NULL
## $ axis.line.y : NULL
## $ axis.line.y.left : NULL

```

```

## $ axis.line.y.right      : NULL
## $ legend.background      : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ legend.margin          : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points
## ..- attr(*, "unit")= int 8
## $ legend.spacing         : 'simpleUnit' num 11points
## ..- attr(*, "unit")= int 8
## $ legend.spacing.x       : NULL
## $ legend.spacing.y       : NULL
## $ legend.key              : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ legend.key.size         : 'simpleUnit' num 1.2lines
## ..- attr(*, "unit")= int 3
## $ legend.key.height       : NULL
## $ legend.key.width        : NULL
## $ legend.text             :List of 11
## ..$ family               : NULL
## ..$ face                  : NULL
## ..$ colour                : NULL
## ..$ size                  : 'rel' num 0.8
## ..$ hjust                 : NULL
## ..$ vjust                 : NULL
## ..$ angle                 : NULL
## ..$ lineheight            : NULL
## ..$ margin                : NULL
## ..$ debug                 : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ legend.text.align       : NULL
## $ legend.title            :List of 11
## ..$ family               : NULL
## ..$ face                  : NULL
## ..$ colour                : NULL
## ..$ size                  : NULL
## ..$ hjust                 : num 0
## ..$ vjust                 : NULL
## ..$ angle                 : NULL
## ..$ lineheight            : NULL
## ..$ margin                : NULL
## ..$ debug                 : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ legend.title.align      : NULL
## $ legend.position          : chr "right"
## $ legend.direction         : NULL
## $ legend.justification     : chr "center"
## $ legend.box               : NULL
## $ legend.box.just          : NULL
## $ legend.box.margin        : 'margin' num [1:4] 0cm 0cm 0cm 0cm
## ..- attr(*, "unit")= int 1
## $ legend.box.background    : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ legend.box.spacing       : 'simpleUnit' num 11points
## ..- attr(*, "unit")= int 8

```

```

## $ panel.background      : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ panel.border          : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ panel.spacing         : 'simpleUnit' num 5.5points
## ..- attr(*, "unit")= int 8
## $ panel.spacing.x       : NULL
## $ panel.spacing.y       : NULL
## $ panel.grid             :List of 6
## ..$ colour              : chr "grey92"
## ..$ size                 : NULL
## ..$ linetype             : NULL
## ..$ lineend              : NULL
## ..$ arrow                : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ panel.grid.major       : NULL
## $ panel.grid.minor       :List of 6
## ..$ colour              : NULL
## ..$ size                 : 'rel' num 0.5
## ..$ linetype             : NULL
## ..$ lineend              : NULL
## ..$ arrow                : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ panel.grid.major.x     : NULL
## $ panel.grid.major.y     : NULL
## $ panel.grid.minor.x     : NULL
## $ panel.grid.minor.y     : NULL
## $ panel.ontop            : logi FALSE
## $ plot.background        : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ plot.title             :List of 11
## ..$ family              : NULL
## ..$ face                 : NULL
## ..$ colour              : NULL
## ..$ size                 : 'rel' num 1.2
## ..$ hjust                : num 0
## ..$ vjust                : num 1
## ..$ angle                : NULL
## ..$ lineheight           : NULL
## ..$ margin               : 'margin' num [1:4] 0points 0points 5.5points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug                : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.title.position    : chr "panel"
## $ plot.subtitle          :List of 11
## ..$ family              : NULL
## ..$ face                 : NULL
## ..$ colour              : NULL
## ..$ size                 : NULL
## ..$ hjust                : num 0
## ..$ vjust                : num 1

```

```

## ..$ angle      : NULL
## ..$ lineheight  : NULL
## ..$ margin      : 'margin' num [1:4] 0points 0points 5.5points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.caption   :List of 11
## ..$ family       : NULL
## ..$ face         : NULL
## ..$ colour       : NULL
## ..$ size         : 'rel' num 0.8
## ..$ hjust        : num 1
## ..$ vjust        : num 1
## ..$ angle        : NULL
## ..$ lineheight   : NULL
## ..$ margin       : 'margin' num [1:4] 5.5points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug        : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.caption.position : chr "panel"
## $ plot.tag         :List of 11
## ..$ family       : NULL
## ..$ face         : NULL
## ..$ colour       : NULL
## ..$ size         : 'rel' num 1.2
## ..$ hjust        : num 0.5
## ..$ vjust        : num 0.5
## ..$ angle        : NULL
## ..$ lineheight   : NULL
## ..$ margin       : NULL
## ..$ debug        : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.tag.position   : chr "topleft"
## $ plot.margin         : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points
## ..- attr(*, "unit")= int 8
## $ strip.background    : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ strip.background.x  : NULL
## $ strip.background.y  : NULL
## $ strip.placement     : chr "inside"
## $ strip.text          :List of 11
## ..$ family          : NULL
## ..$ face            : NULL
## ..$ colour          : chr "grey10"
## ..$ size            : 'rel' num 0.8
## ..$ hjust          : NULL
## ..$ vjust          : NULL
## ..$ angle          : NULL
## ..$ lineheight     : NULL
## ..$ margin         : 'margin' num [1:4] 4.4points 4.4points 4.4points 4.4points
## ..- attr(*, "unit")= int 8

```



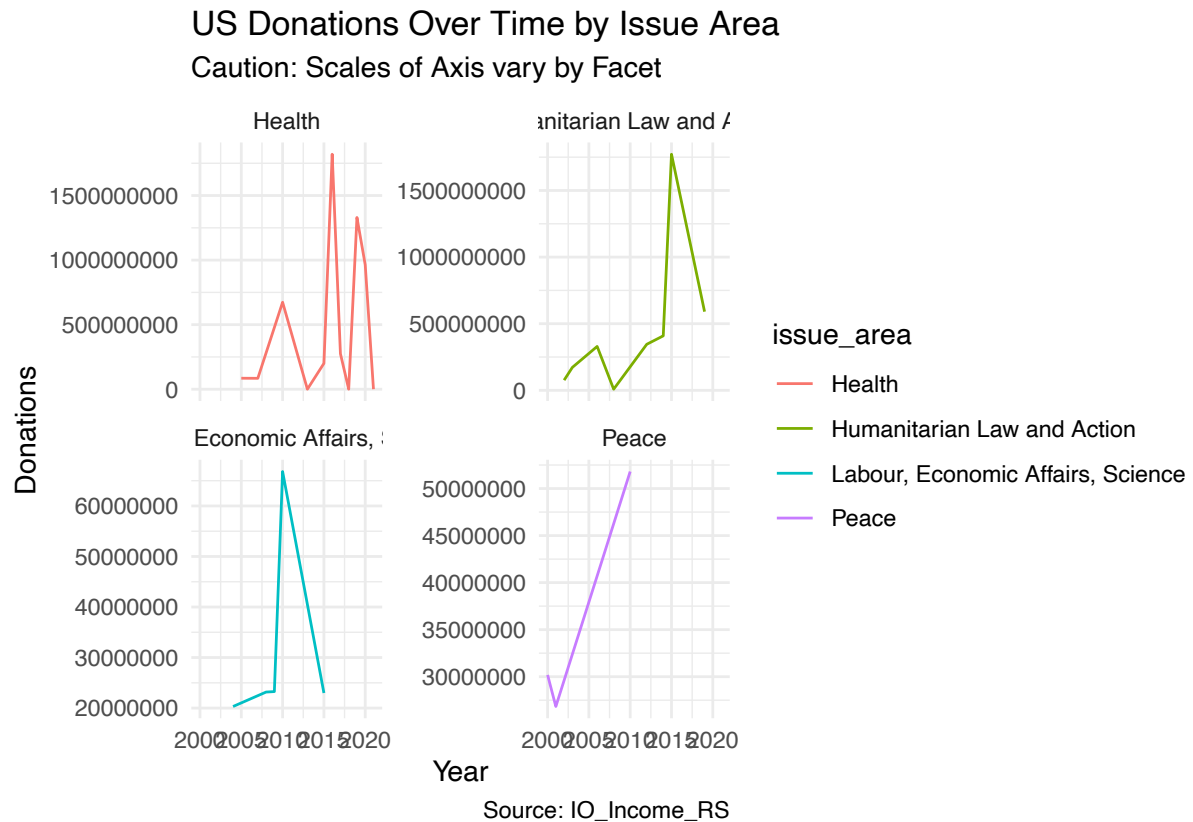
```
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.text.x      : NULL
## $ strip.text.y      :List of 11
## ..$ family         : NULL
## ..$ face           : NULL
## ..$ colour         : NULL
## ..$ size           : NULL
## ..$ hjust          : NULL
## ..$ vjust          : NULL
## ..$ angle          : num -90
## ..$ lineheight     : NULL
## ..$ margin         : NULL
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.switch.pad.grid : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.switch.pad.wrap : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.text.y.left    :List of 11
## ..$ family           : NULL
## ..$ face             : NULL
## ..$ colour           : NULL
## ..$ size             : NULL
## ..$ hjust            : NULL
## ..$ vjust            : NULL
## ..$ angle            : num 90
## ..$ lineheight       : NULL
## ..$ margin           : NULL
## ..$ debug            : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## - attr(*, "class")= chr [1:2] "theme" "gg"
## - attr(*, "complete")= logi TRUE
## - attr(*, "validate")= logi TRUE
```

Solution 2

```
io_income_rs %>%
  filter(donor == "United States") %>%
  group_by(year, issue_area) %>%
  summarise(total_amount_nominal = sum(amount_nominal), na.rm = TRUE) %>%
  ggplot(mapping = aes(x=year, y=total_amount_nominal, color = issue_area)) +
  geom_line() +
  facet_wrap(~issue_area, scales = "free_y") + #alternatively, we could put 'issue area' in double quotes
  labs(title = "US Donations Over Time by Issue Area",
       subtitle = "Caution: Scales of Axis vary by Facet",
       x = "Year",
       y = "Donations",
       caption = "Source: IO_Income_RS") +
```

```
theme_minimal()
```

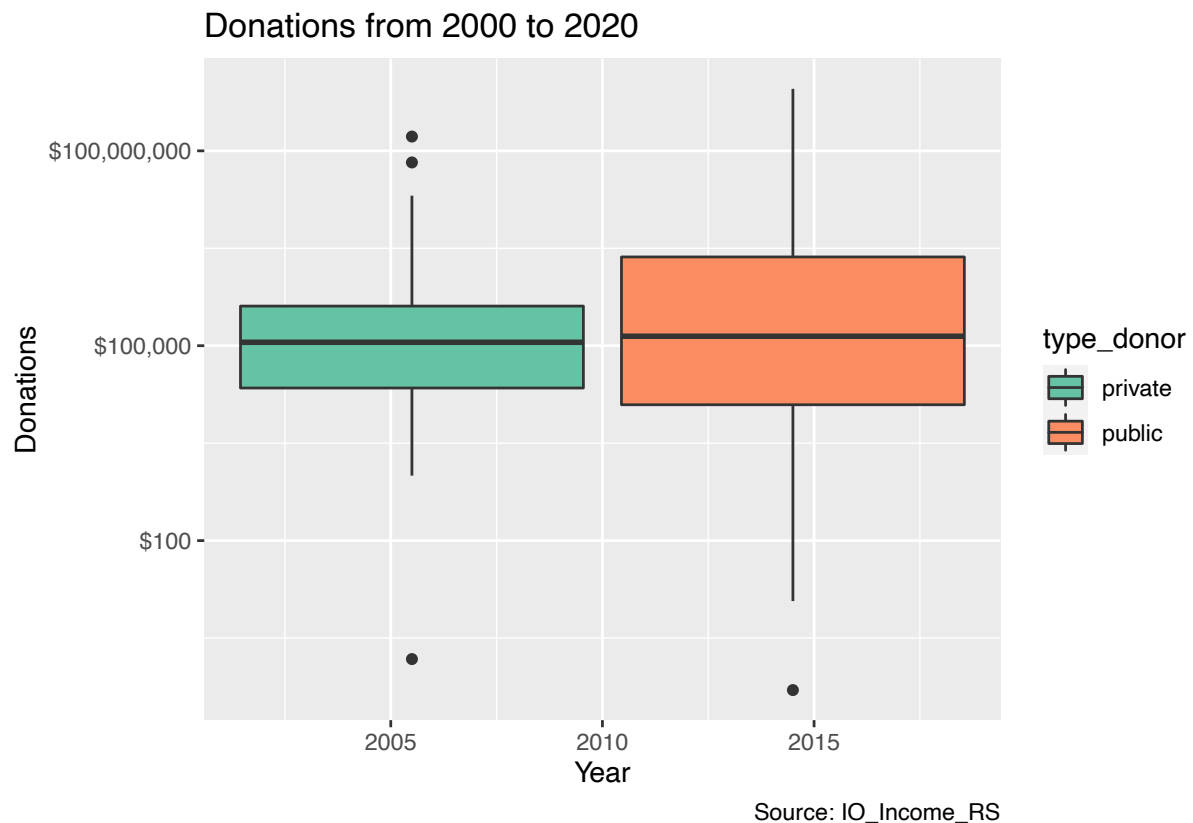
```
## 'summarise()' has grouped output by 'year'. You can override using the
## '.groups' argument.
```



```
# US donation to all issue areas have not particularly increased over time.
# Donations to peace show a clear rise.
```

Solution 3

```
io_income_rs %>%
  filter(year == 2000 | year == 2020) %>%
  drop_na() %>%
  ggplot(mapping = aes(x= year, y= amount_nominal, fill = type_donor)) +
  geom_boxplot() +
  labs(title = "Donations from 2000 to 2020",
       x = "Year",
       y = "Donations",
       caption = "Source: IO_Income_RS") +
  scale_y_log10(labels= scales::dollar) +
  scale_fill_brewer(palette = "Set2")
```



Solution 4

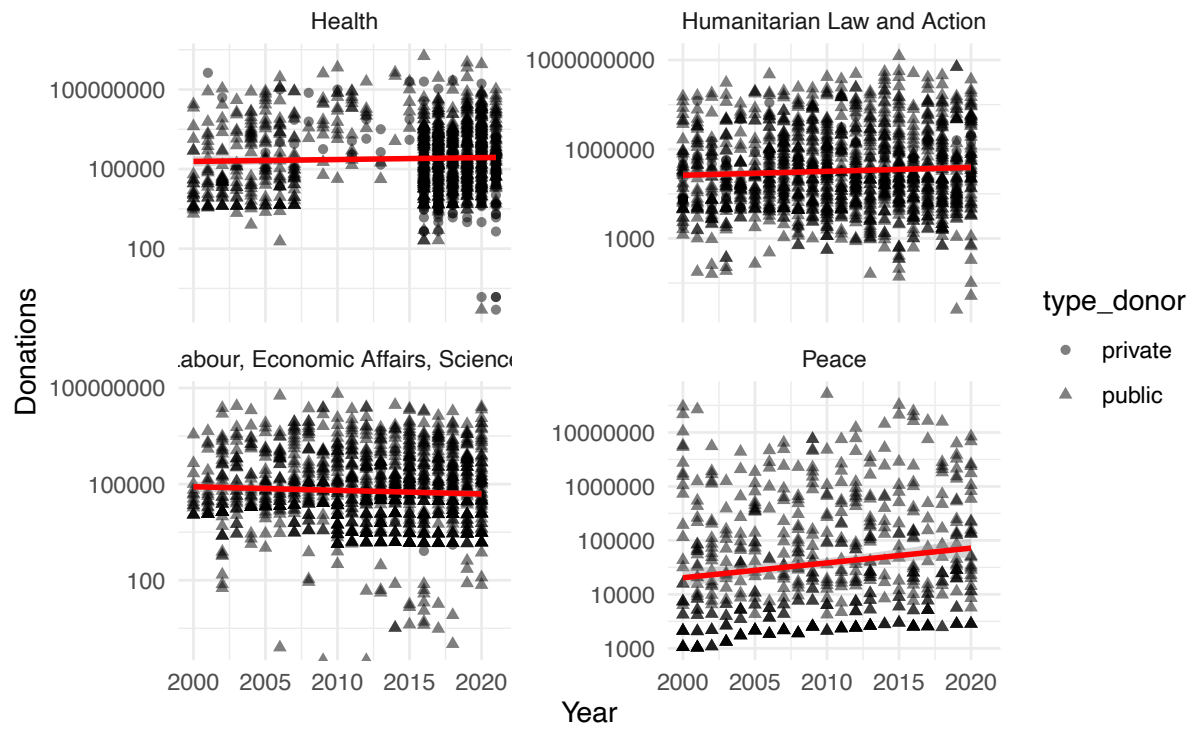
```
io_income_rs %>%
  drop_na() %>%
  ggplot(mapping = aes(x=year, y=amount_nominal)) +
  geom_point(aes(shape=type_donor), alpha = .5)+
  facet_wrap(~issue_area, scales = "free_y") +
  labs(title = "Donations by Year per Donor type",
        x = "Year",
        y = "Donations",
        caption = "Source: IO_Income_RS") +
  geom_smooth(method = 'lm', color = "red") +
  scale_y_log10() +
  theme_minimal()
```

```
## Warning: Transformation introduced infinite values in continuous y-axis
## Transformation introduced infinite values in continuous y-axis
```

```
## 'geom_smooth()' using formula 'y ~ x'
```

```
## Warning: Removed 2 rows containing non-finite values (stat_smooth).
```

Donations by Year per Donor type



Source: IO_Income_RS