CSE3020 - Data Visualisation

Lab Assignment 3

GGPLOT2 - Books Dataset

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LAB - L13+L14

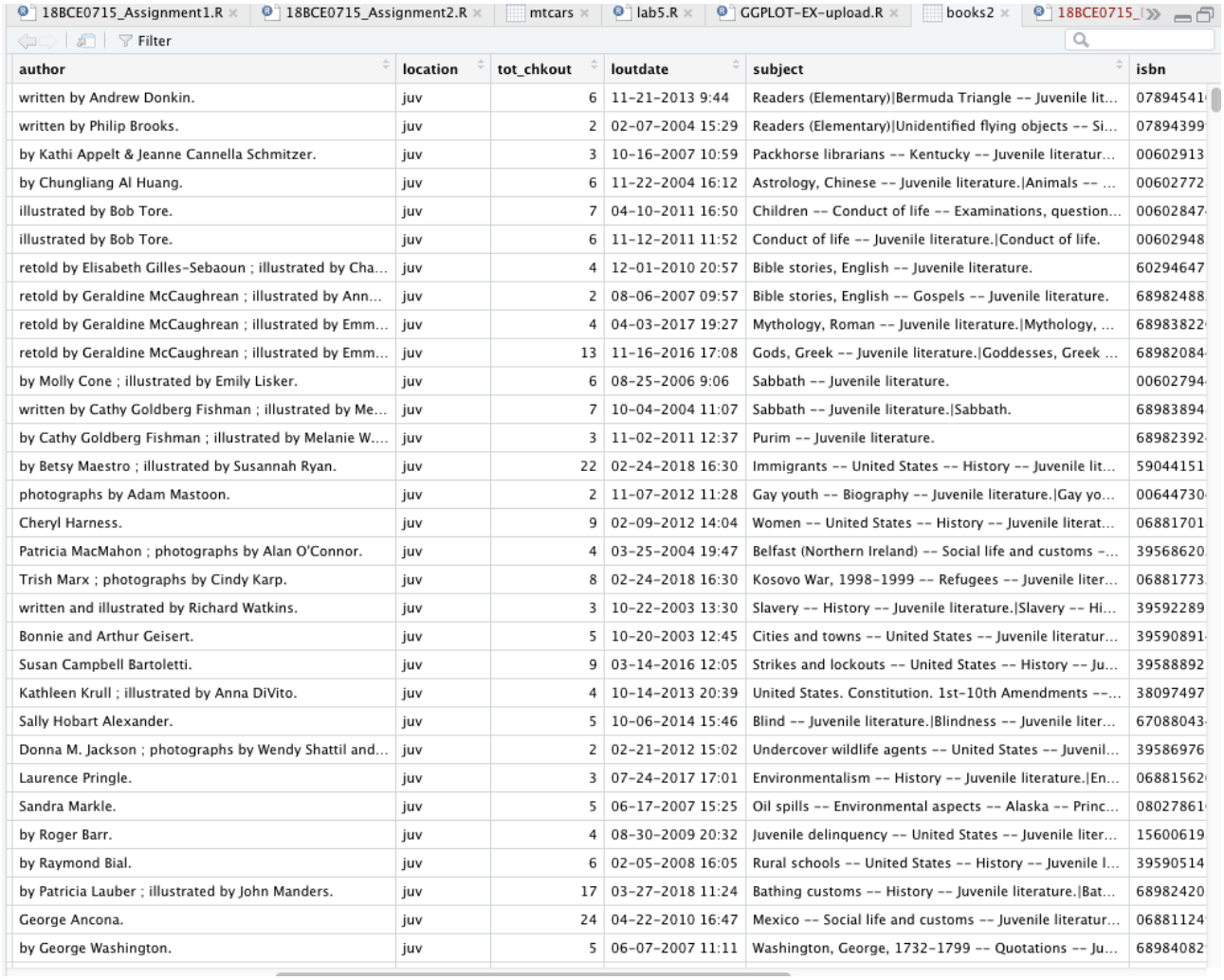
Question and Solution

1. Remove NA values

omit NA

books2 = na.omit(books)

books2



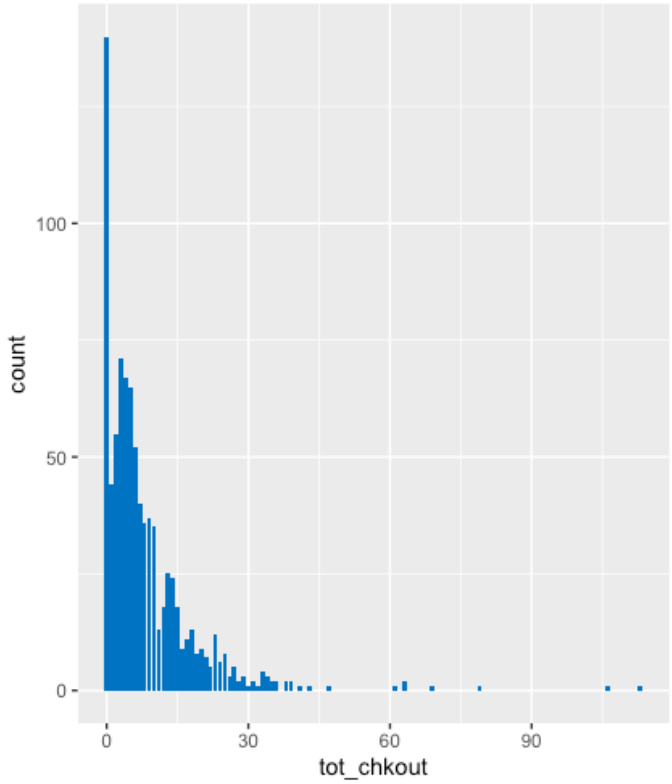
18BCE0715_Assignment1.R | 18BCE0715_Assignment2.R | mtcars | lab5.R | GGPLOT-EX-upload.R | books2 | 18BCE0715_

Filter

author	location	tot_chkout	loutdate	subject	isbn
written by Andrew Donkin.	juv	6	11-21-2013 9:44	Readers (Elementary)|Bermuda Triangle -- Juvenile lit...	07894541
written by Philip Brooks.	juv	2	02-07-2004 15:29	Readers (Elementary)|Unidentified flying objects -- Si...	07894399
by Kathi Appelt & Jeanne Cannella Schmitzer.	juv	3	10-16-2007 10:59	Packhorse librarians -- Kentucky -- Juvenile literatur...	00602913
by Chungliang Al Huang.	juv	6	11-22-2004 16:12	Astrology, Chinese -- Juvenile literature.|Animals -- ...	00602772
illustrated by Bob Tore.	juv	7	04-10-2011 16:50	Children -- Conduct of life -- Examinations, question...	00602847
illustrated by Bob Tore.	juv	6	11-12-2011 11:52	Conduct of life -- Juvenile literature.|Conduct of life.	00602948
retold by Elisabeth Gilles-Sebaoun ; illustrated by Cha...	juv	4	12-01-2010 20:57	Bible stories, English -- Juvenile literature.	60294647
retold by Geraldine McCaughrean ; illustrated by Ann...	juv	2	08-06-2007 09:57	Bible stories, English -- Gospels -- Juvenile literature.	68982488
retold by Geraldine McCaughrean ; illustrated by Emm...	juv	4	04-03-2017 19:27	Mythology, Roman -- Juvenile literature.|Mythology, ...	68983822
retold by Geraldine McCaughrean ; illustrated by Emm...	juv	13	11-16-2016 17:08	Gods, Greek -- Juvenile literature.|Goddesses, Greek ...	68982084
by Molly Cone ; illustrated by Emily Lisker.	juv	6	08-25-2006 9:06	Sabbath -- Juvenile literature.	00602794
written by Cathy Goldberg Fishman ; illustrated by Me...	juv	7	10-04-2004 11:07	Sabbath -- Juvenile literature.|Sabbath.	68983894
by Cathy Goldberg Fishman ; illustrated by Melanie W....	juv	3	11-02-2011 12:37	Purim -- Juvenile literature.	68982392
by Betsy Maestro ; illustrated by Susannah Ryan.	juv	22	02-24-2018 16:30	Immigrants -- United States -- History -- Juvenile lit...	59044151
photographs by Adam Mastoon.	juv	2	11-07-2012 11:28	Gay youth -- Biography -- Juvenile literature.|Gay yo...	00644730
Cheryl Harness.	juv	9	02-09-2012 14:04	Women -- United States -- History -- Juvenile literat...	06881701
Patricia MacMahon ; photographs by Alan O'Connor.	juv	4	03-25-2004 19:47	Belfast (Northern Ireland) -- Social life and customs -...	39568620
Trish Marx ; photographs by Cindy Karp.	juv	8	02-24-2018 16:30	Kosovo War, 1998-1999 -- Refugees -- Juvenile liter...	06881773
written and illustrated by Richard Watkins.	juv	3	10-22-2003 13:30	Slavery -- History -- Juvenile literature.|Slavery -- Hi...	39592289
Bonnie and Arthur Geisert.	juv	5	10-20-2003 12:45	Cities and towns -- United States -- Juvenile literatur...	39590891
Susan Campbell Bartoletti.	juv	9	03-14-2016 12:05	Strikes and lockouts -- United States -- History -- Ju...	39588892
Kathleen Krull ; illustrated by Anna DiVito.	juv	4	10-14-2013 20:39	United States. Constitution. 1st-10th Amendments --...	38097497
Sally Hobart Alexander.	juv	5	10-06-2014 15:46	Blind -- Juvenile literature.|Blindness -- Juvenile liter...	67088043
Donna M. Jackson ; photographs by Wendy Shattil and...	juv	2	02-21-2012 15:02	Undercover wildlife agents -- United States -- Juvenil...	39586976
Laurence Pringle.	juv	3	07-24-2017 17:01	Environmentalism -- History -- Juvenile literature.|En...	06881562
Sandra Markle.	juv	5	06-17-2007 15:25	Oil spills -- Environmental aspects -- Alaska -- Princ...	08027861
by Roger Barr.	juv	4	08-30-2009 20:32	Juvenile delinquency -- United States -- Juvenile liter...	15600619
by Raymond Bial.	juv	6	02-05-2008 16:05	Rural schools -- United States -- History -- Juvenile l...	39590514
by Patricia Lauber ; illustrated by John Manders.	juv	17	03-27-2018 11:24	Bathing customs -- History -- Juvenile literature.|Bat...	68982420
George Ancona.	juv	24	04-22-2010 16:47	Mexico -- Social life and customs -- Juvenile literatur...	06881124
by George Washington.	juv	5	06-07-2007 11:11	Washington, George, 1732-1799 -- Quotations -- Ju...	68984082

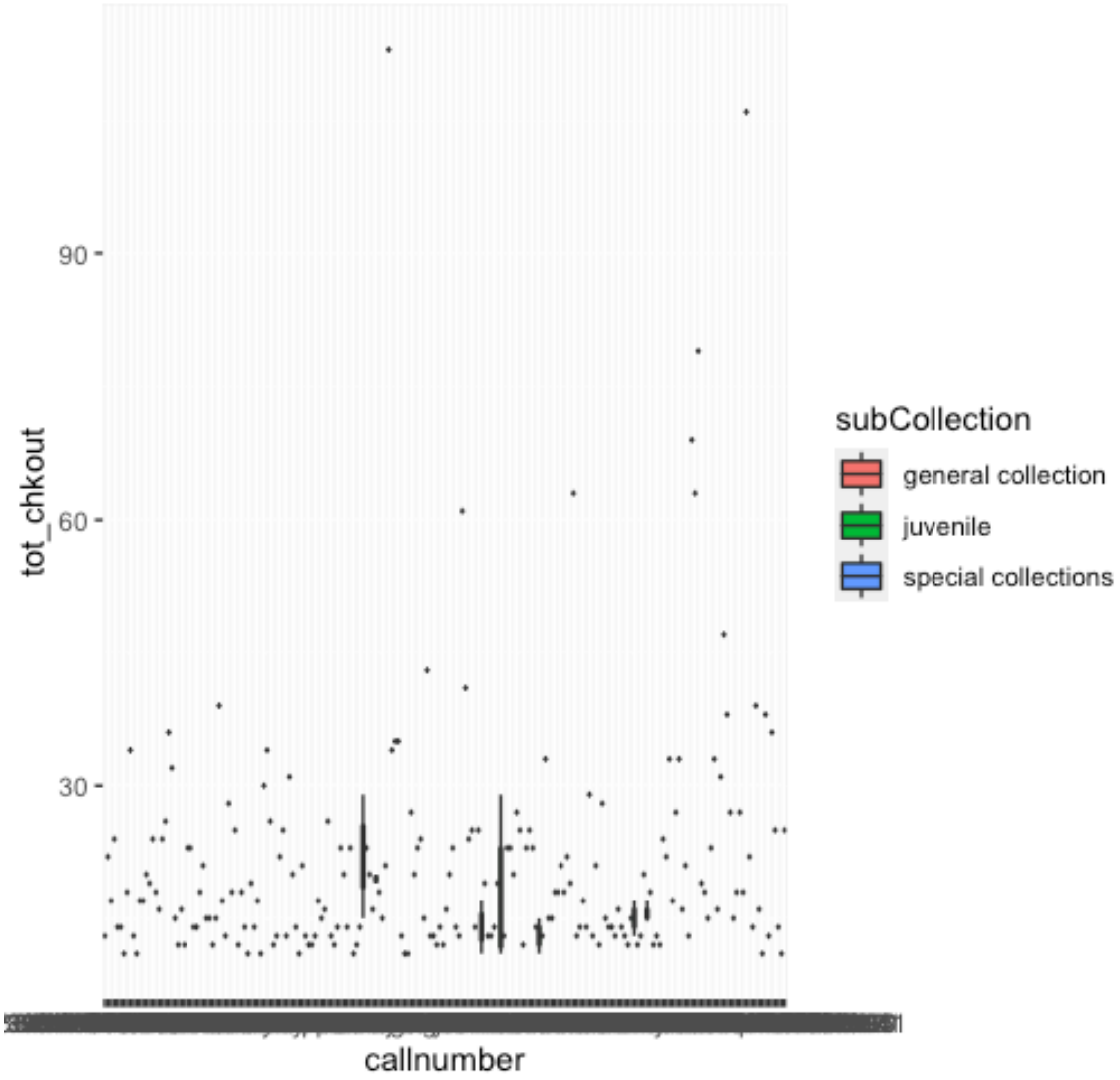
2. Visualize frequency distribution of checkouts in the book dataset

```
str(books2)

ggplot(books2, aes(tot_chkout))
+

  geom_bar(fill = "#0073C2FF")
```



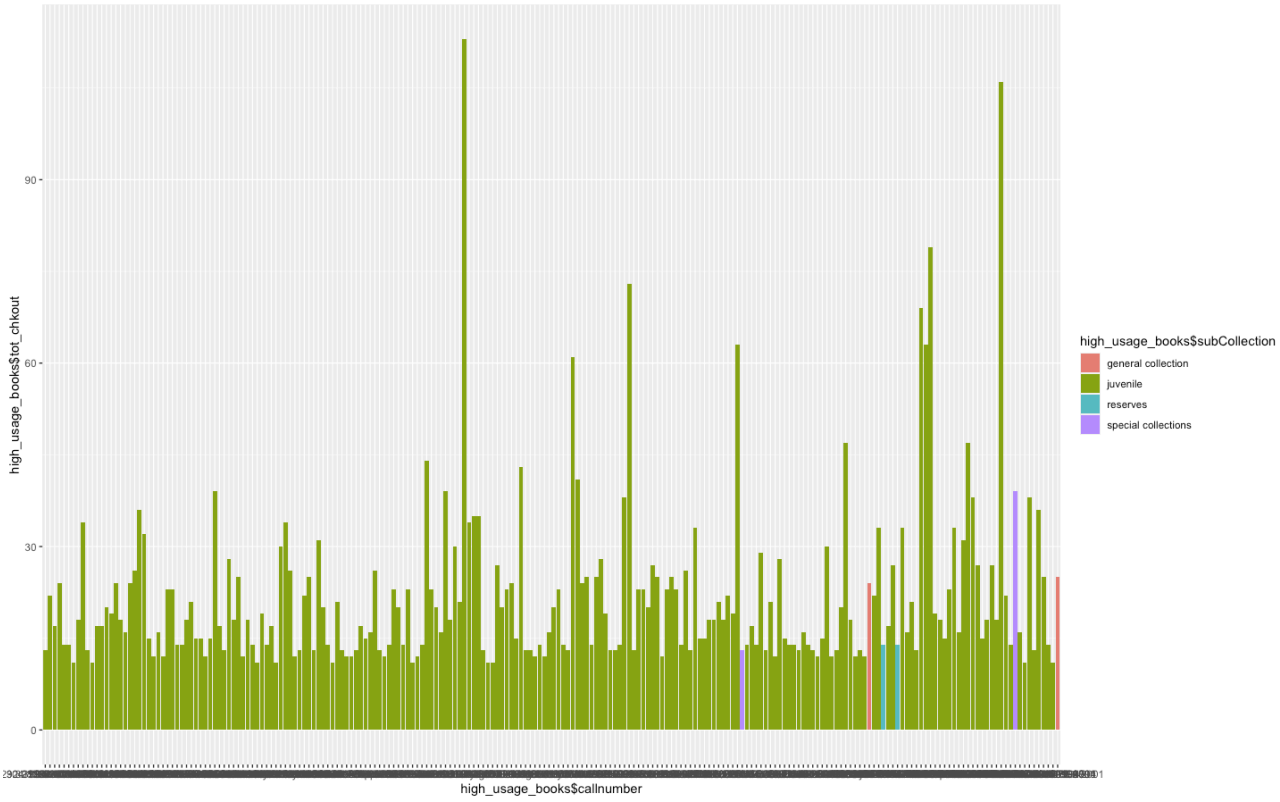
3. Visualize boxplot plot high usage books by call number class[Hint: derive new variable high usage books which have more than 10 checkouts] and color by subCollection- any three category (here the 3 category are juvenile, general collection and special collection)

```
high_usage_books = books2[books2$tot_chkout>10,]

high_usage_books

df_remove_one_cat =
high_usage_books[high_usage_books$subCollection != "reserves",]

ggplot(df_remove_one_cat, aes(x=callnumber,y=tot_chkout,
fill=subCollection)) +

  geom_boxplot(outlier.colour="orange", outlier.shape=16,

               outlier.size=2, notch=FALSE)
```



3. Visualize stacked bar and group chart high usage books by call number class[Hint: derive new variable high usage books which have more than 10 checkouts] and color by subCollection- any four category

```
ggplot(high_usage_books, aes(x=callnumber,y=tot_chkout,
fill=subCollection)) +
  geom_bar(position="stack",stat="identity")
ggplot(high_usage_books, aes(x=callnumber, y=tot_chkout,
fill=subCollection)) + geom_bar(position="dodge", stat="identity")
```

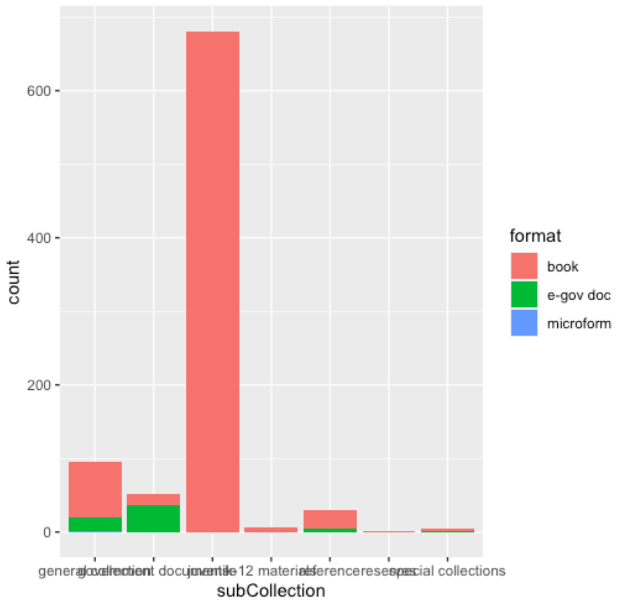


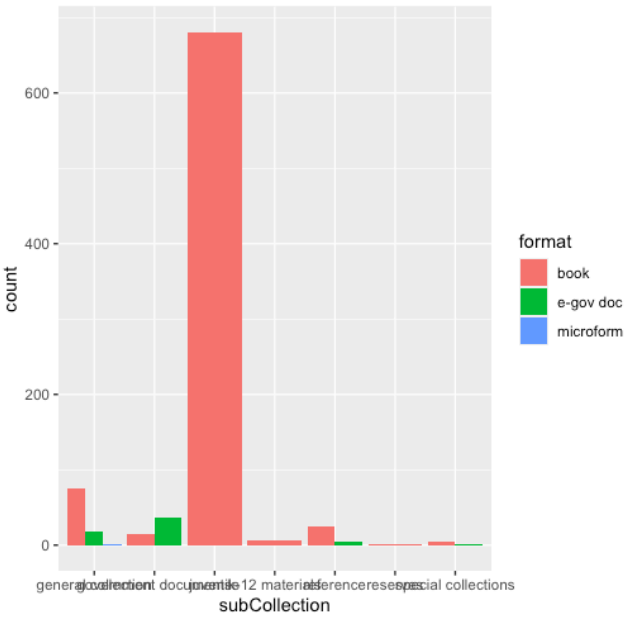
5. Create a bar plot that depicts the number of items in each sub-collection, faceted by format. Arrange sub plots horizontally.

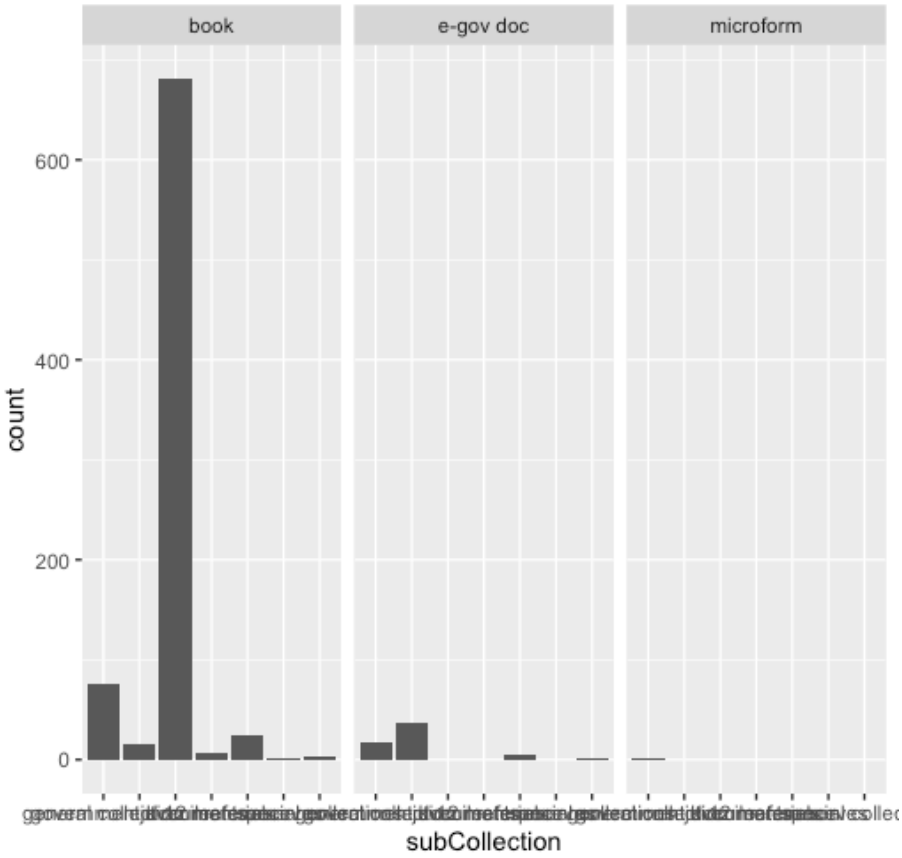
```
p <- ggplot(books2,aes(subCollection)) +
  geom_bar() +
  facet_wrap(~format)
  p
```

// same visualisation with stacked and grouped bar graphs

```
freq_table <- books2 %>%
  group_by(subCollection, format) %>%
  summarise(count = n())

str(freq_table)
ggplot(freq_table, aes(x=subCollection, y=count, fill=format)) +
geom_bar(position="stack", stat="identity")
ggplot(freq_table, aes(x=subCollection, y=count, fill=format)) +
geom_bar(position="dodge", stat="identity")
```

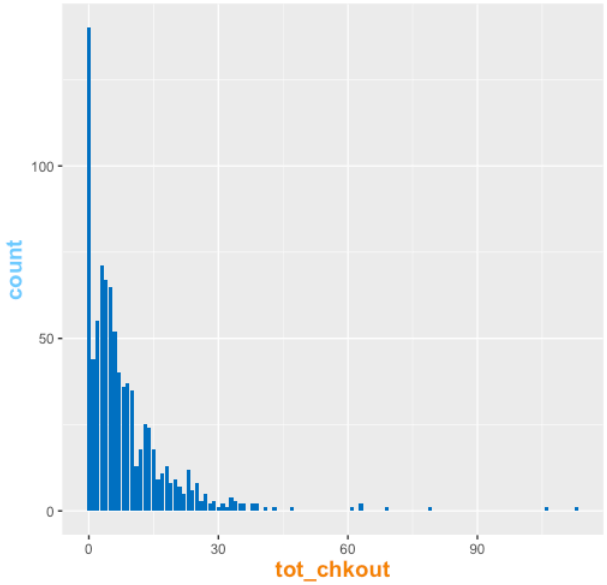

600
400
200
0
count
format
book
e-gov doc
microform
subCollection

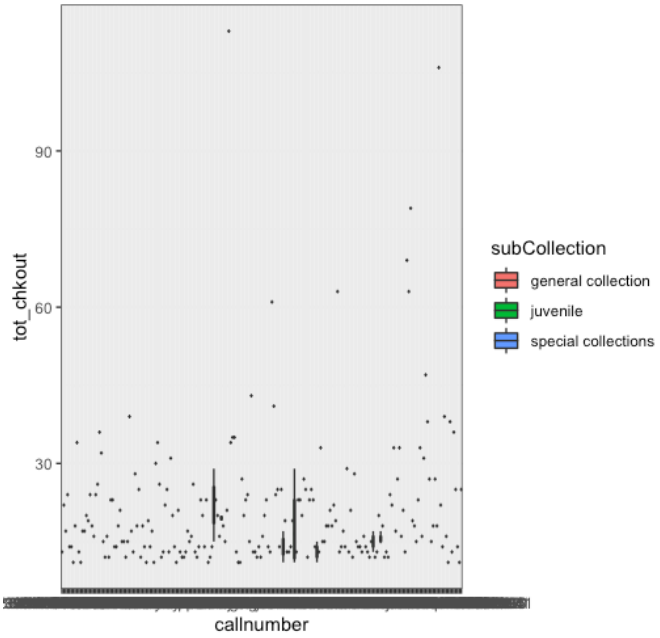

600
400
200
0
count
format
book
e-gov doc
microform
subCollection

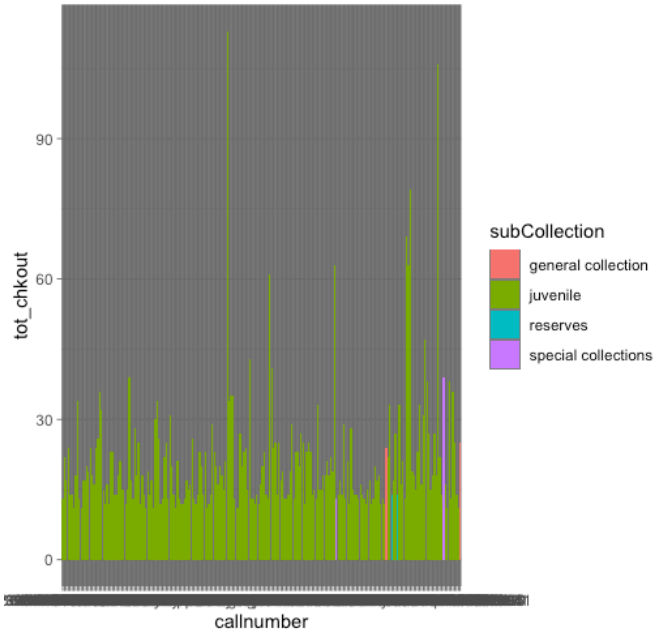

book
e-gov doc
microform
600
400
200
0
count
subCollection

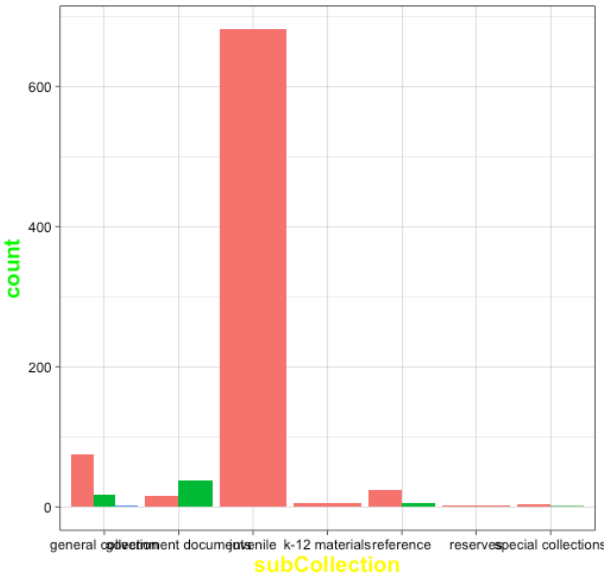
6. New Themes for all the above plots

```
# New Themes


ggplot(books2, aes(tot_chkout)) +
  geom_bar(fill = "#0073C2FF") +
  theme(legend.position="none",
        axis.title.x = element_text(color="#f7860c", size=14,
face="bold"),
        axis.title.y = element_text(color="#73ceff", size=14,
face="bold"))



ggplot(df_remove_one_cat, aes(x=callnumber,y=tot_chkout,
fill=subCollection)) +
  geom_boxplot(outlier.colour="orange", outlier.shape=16,
               outlier.size=2, notch=FALSE) + theme_bw()

ggplot(high_usage_books, aes(x=callnumber, y=tot_chkout,
fill=subCollection)) + geom_bar(position="dodge", stat="identity") +
theme_dark()

ggplot(freq_table, aes(x=subCollection, y=count, fill=format)) +
geom_bar(position="dodge", stat="identity") + theme_linedraw() +
theme(legend.position="none",

axis.title.x = element_text(color="yellow", size=14, face="bold"),

axis.title.y = element_text(color="green", size=14, face="bold"))
```


count
100
50
0
0
30
60
90
tot_chkout


tot_chkout
90
60
30
callnumber
subCollection
general collection
juvenile
special collections


tot_chkout
90
60
30
0
callnumber
subCollection
general collection
juvenile
reserves
special collections


count
600
400
200
0
general collection
government documents
juvenile
k-12 materials
reference
reserves
special collections
subCollection