

Data Storyteller Assignment

Ahmed Ahmed

2022-09-06

Upload data & quick check

Upload mapping file and tidy up data table

```
mappings <- read.csv("Dummy_data_var_mapping.csv")
head(mappings)
```

```
##   i..VAR.NAME                                VAR.LABEL
## 1          V1                                ResponseID
## 2          Q2          Q2 Involvement in development (types 81 to 89)
## 3          Q3 Q3 Company size (ranges, from 1 smallest to 8 largest)
## 4         Q5.1                                Q5-Role 1
## 5         Q5.2                                Q5-Role 2
## 6         Q5.3                                Q5-Role 3
```

```
colnames(mappings)[1] <- "Var.Name"
mappings <- mappings[mappings$Var.Name!="",]
head(mappings)
```

```
##   Var.Name                                VAR.LABEL
## 1          V1                                ResponseID
## 2          Q2          Q2 Involvement in development (types 81 to 89)
## 3          Q3 Q3 Company size (ranges, from 1 smallest to 8 largest)
## 4         Q5.1                                Q5-Role 1
## 5         Q5.2                                Q5-Role 2
## 6         Q5.3                                Q5-Role 3
```

Upload dummy survey data and tidy up content

```
data <- read.csv("Dummy_survey_data.csv")
head(data)
```

```
##          V1 Q2 Q3 Q5.1 Q5.2 Q5.3 Q5.4 Q5.5 Q6 Q10.1.1 Q10.1.2 Q10.1.3
## 1 R_aXE7seqJu0LmVFz 85 4 0 0 0 1 0 6 0 0 0
## 2 R_5vVjAI7X7mjFv5r 84 1 0 1 1 1 0 4 0 0 0
## 3 R_06sqswy5R4sV8sl 85 2 1 0 0 0 0 3 0 0 0
## 4 R_2rjuFIvBirJRKnz 85 5 1 0 0 0 0 6 0 0 0
## 5 R_7UM1Gsr1ye3db49 85 5 1 0 0 0 0 4 0 0 0
## 6 R_01cRgkoaxMbaHc1 89 7 1 0 0 0 0 3 0 0 0
## Q10.2.1 Q10.2.2 Q10.2.3 Q10.3.1 Q10.3.2 Q10.3.3 Q10.4.1 Q10.4.2 Q10.4.3 Q12.1
## 1 0 0 0 0 0 0 0 0 0 0
## 2 0 0 0 0 0 0 0 0 0 1
## 3 0 0 0 0 0 0 0 0 0 0
## 4 0 0 0 0 0 0 0 0 0 0
## 5 0 0 0 0 0 0 0 0 0 0
## 6 0 0 0 0 0 0 0 0 0 0
## Q12.2 Q12.4 Q12.5 Q12.6 Q12.7 Q12.8 Q14.1 Q14.2 Q14.3 Q14.4 Q14.5 Q14.7
## 1 0 0 0 0 0 0 0 0 1 0 0 0
## 2 0 0 0 0 0 0 1 0 0 0 0 0
## 3 0 1 0 0 0 0 0 0 0 0 0 0
## 4 0 1 0 0 0 0 0 0 1 0 0 0
## 5 0 0 0 0 0 0 0 0 0 0 0 0
## 6 0 0 0 0 0 0 0 0 0 0 0 0
## Q15.1.1 Q15.1.2 Q15.2.1 Q15.2.2 Q15.3.1 Q15.3.2 Q15.4.1 Q15.4.2 Q15.5.1
## 1 1 0 0 0 0 0 0 0
## 2 0 0 0 0 1 0 0 0
## 3 0 0 0 0 0 0 0 0
## 4 0 0 0 0 0 1 0 1
## 5 1 0 0 0 0 0 0 0
## 6 0 0 0 0 0 0 0 0
## Q15.5.2 Q15.6.1 Q15.6.2
## 1 0 0 0
## 2 0 0 0
## 3 0 0 0
## 4 0 0 0
## 5 0 0 0
## 6 0 0 0
```

```
nrow(data)
```

```
## [1] 9999
```

```
colnames(data) <- mappings[,2]
head(data)
```

```

##      ResponseID Q2 Involvement in development (types 81 to 89)
## 1 R_aXE7seqJu0LmVFz      85
## 2 R_5vVjAI7X7mjFv5r      84
## 3 R_06sqswy5R4sV8s1      85
## 4 R_2rjuFIvBirJRKnz      85
## 5 R_7UM1Gsr1ye3db49      85
## 6 R_01cRgkoaxMbaHc1      89
## Q3 Company size (ranges, from 1 smallest to 8 largest) Q5-Role 1 Q5-Role 2
## 1      4      0      0
## 2      1      0      1
## 3      2      1      0
## 4      5      1      0
## 5      5      1      0
## 6      7      1      0
## Q5-Role 3 Q5-Role 4 Q5-Role 5 Q6 Experience Q10-Platform 1-Primary
## 1      0      1      0      6      0
## 2      1      1      0      4      0
## 3      0      0      0      3      0
## 4      0      0      0      6      0
## 5      0      0      0      4      0
## 6      0      0      0      3      0
## Q10-Platform 1-Secondary Q10-Platform 1-Third Q10-Platform 2-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 2-Secondary Q10-Platform 2-Third Q10-Platform 3-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 3-Secondary Q10-Platform 3-Third Q10-Platform 4-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 4-Secondary Q10-Platform 4-Third Q12-app type 1 Q12-app type 2
## 1      0      0      0      0
## 2      0      0      1      0
## 3      0      0      0      0
## 4      0      0      0      0
## 5      0      0      0      0
## 6      0      0      0      0
## Q12-app type 3 Q12-app type 4 Q12-app type 5 Q12-app type 6 Q12-app type 7
## 1      0      0      0      0      0
## 2      0      0      0      0      0
## 3      1      0      0      0      0
## 4      1      0      0      0      0
## 5      0      0      0      0      0
## 6      0      0      0      0      0
## Q14-tool type 1 Q14-tool type 2 Q14-tool type 3 Q14-tool type 4
## 1      0      0      1      0
## 2      1      0      0      0
## 3      0      0      0      0
## 4      0      0      1      0
## 5      0      0      0      0
## 6      0      0      0      0
## Q14-tool type 5 Q14-tool type 6 Q15-Language 1-Primary
## 1      0      0      1
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      1
## 6      0      0      0
## Q15-Language 1-Also using Q15-Language 2-Primary Q15-Language 2-Also using
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0

```

```
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
##   Q15-Language 3-Primary Q15-Language 3-Also using Q15-Language 4-Primary
## 1      0      0      0
## 2      1      0      0
## 3      0      0      0
## 4      0      1      0
## 5      0      0      0
## 6      0      0      0
##   Q15-Language 4-Also using Q15-Language 5-Primary Q15-Language 5-Also using
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      1      0      0
## 5      0      0      0
## 6      0      0      0
##   Q15-Language 6-Primary Q15-Language 6-Also using
## 1      0      0
## 2      0      0
## 3      0      0
## 4      0      0
## 5      0      0
## 6      0      0
```

View(data)

To check validity of data, we can check that the row sums of platform 1-4 columns always add up to less than 4. Since in the survey you can only choose a maximum of 3 platform.

```
check.plat <- apply((data[,c(10:21)]),FUN =sum,MARGIN=1)
all(check.plat<4)
```

```
## [1] TRUE
```

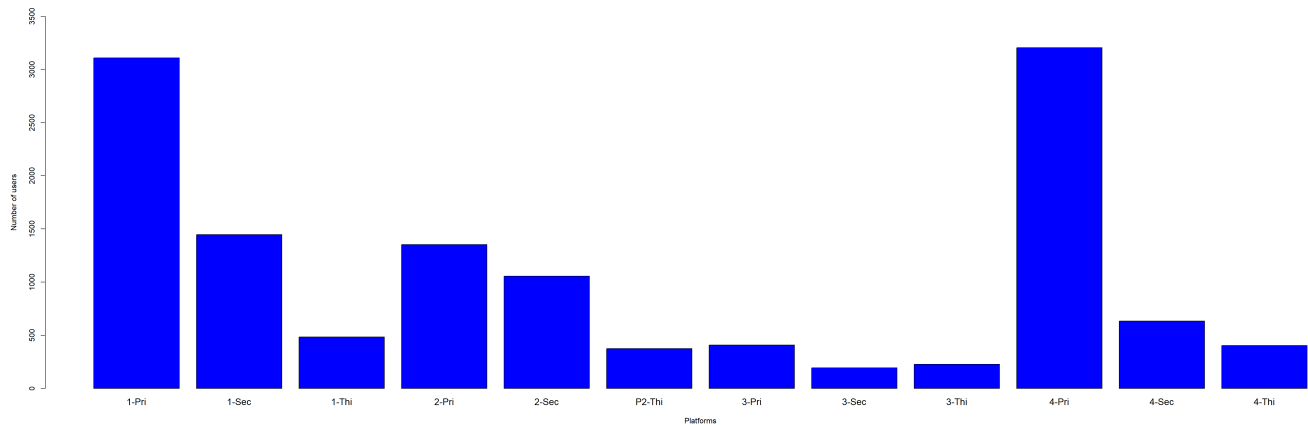
How do the featured platform differ in usage?

We will illustrate the answer to this question using a bar plot as shown below

```
plat.data <- data[,c(10:21)]
head(plat.data)
```

```
##   Q10-Platform 1-Primary Q10-Platform 1-Secondary Q10-Platform 1-Third
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
##   Q10-Platform 2-Primary Q10-Platform 2-Secondary Q10-Platform 2-Third
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
##   Q10-Platform 3-Primary Q10-Platform 3-Secondary Q10-Platform 3-Third
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
##   Q10-Platform 4-Primary Q10-Platform 4-Secondary Q10-Platform 4-Third
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
```

```
labels <- c("1-Pri","1-Sec","1-Thi","2-Pri",
            "2-Sec","P2-Thi","3-Pri","3-Sec","3-Thi",
            "4-Pri","4-Sec","4-Thi")
barplot(apply(plat.data,2,sum),col="blue",names.arg = labels,ylim = c(0,3500),cex.names = 1.22,ylab = "Number of users",xlab = "Platforms")
```



We can see that respondent primarily used Platform 1 and 4. Platform 3 had the lowest usage, with relatively fewer respondents using it in any capacity.

How does the profile of Platform 1 primary users compare to that of

Platform 3 primary users?

First we obtain data for platform 1 primary users from our data table.

```
head(data)
```

```

##      ResponseID Q2 Involvement in development (types 81 to 89)
## 1 R_aXE7seqJu0LmVFz      85
## 2 R_5vVjAI7X7mjFv5r      84
## 3 R_06sqswy5R4sV8s1      85
## 4 R_2rjuFIvBirJRKnz      85
## 5 R_7UM1Gsr1ye3db49      85
## 6 R_01cRgkoaxMbaHc1      89
## Q3 Company size (ranges, from 1 smallest to 8 largest) Q5-Role 1 Q5-Role 2
## 1      4      0      0
## 2      1      0      1
## 3      2      1      0
## 4      5      1      0
## 5      5      1      0
## 6      7      1      0
## Q5-Role 3 Q5-Role 4 Q5-Role 5 Q6 Experience Q10-Platform 1-Primary
## 1      0      1      0      6      0
## 2      1      1      0      4      0
## 3      0      0      0      3      0
## 4      0      0      0      6      0
## 5      0      0      0      4      0
## 6      0      0      0      3      0
## Q10-Platform 1-Secondary Q10-Platform 1-Third Q10-Platform 2-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 2-Secondary Q10-Platform 2-Third Q10-Platform 3-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 3-Secondary Q10-Platform 3-Third Q10-Platform 4-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 4-Secondary Q10-Platform 4-Third Q12-app type 1 Q12-app type 2
## 1      0      0      0      0
## 2      0      0      1      0
## 3      0      0      0      0
## 4      0      0      0      0
## 5      0      0      0      0
## 6      0      0      0      0
## Q12-app type 3 Q12-app type 4 Q12-app type 5 Q12-app type 6 Q12-app type 7
## 1      0      0      0      0      0
## 2      0      0      0      0      0
## 3      1      0      0      0      0
## 4      1      0      0      0      0
## 5      0      0      0      0      0
## 6      0      0      0      0      0
## Q14-tool type 1 Q14-tool type 2 Q14-tool type 3 Q14-tool type 4
## 1      0      0      1      0
## 2      1      0      0      0
## 3      0      0      0      0
## 4      0      0      1      0
## 5      0      0      0      0
## 6      0      0      0      0
## Q14-tool type 5 Q14-tool type 6 Q15-Language 1-Primary
## 1      0      0      1
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      1
## 6      0      0      0
## Q15-Language 1-Also using Q15-Language 2-Primary Q15-Language 2-Also using
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0

```

## 4	0	0	0
## 5	0	0	0
## 6	0	0	0
##	Q15-Language 3-Primary	Q15-Language 3-Also using	Q15-Language 4-Primary
## 1	0	0	0
## 2	1	0	0
## 3	0	0	0
## 4	0	1	0
## 5	0	0	0
## 6	0	0	0
##	Q15-Language 4-Also using	Q15-Language 5-Primary	Q15-Language 5-Also using
## 1	0	0	0
## 2	0	0	0
## 3	0	0	0
## 4	1	0	0
## 5	0	0	0
## 6	0	0	0
##	Q15-Language 6-Primary	Q15-Language 6-Also using	
## 1	0	0	
## 2	0	0	
## 3	0	0	
## 4	0	0	
## 5	0	0	
## 6	0	0	

```
plat.1.primary <- data[,c(-(11:15),-(16:21))]
head(plat.1.primary)
```

```

##      ResponseID Q2 Involvement in development (types 81 to 89)
## 1 R_aXE7seqJu0LmVFz      85
## 2 R_5vVjAI7X7mjFv5r      84
## 3 R_06sqswy5R4sV8s1      85
## 4 R_2rjuFIvBirJRKnz      85
## 5 R_7UM1Gsr1ye3db49      85
## 6 R_01cRgkoaxMbaHc1      89
## Q3 Company size (ranges, from 1 smallest to 8 largest) Q5-Role 1 Q5-Role 2
## 1      4      0      0
## 2      1      0      1
## 3      2      1      0
## 4      5      1      0
## 5      5      1      0
## 6      7      1      0
## Q5-Role 3 Q5-Role 4 Q5-Role 5 Q6 Experience Q10-Platform 1-Primary
## 1      0      1      0      6      0
## 2      1      1      0      4      0
## 3      0      0      0      3      0
## 4      0      0      0      6      0
## 5      0      0      0      4      0
## 6      0      0      0      3      0
## Q12-app type 1 Q12-app type 2 Q12-app type 3 Q12-app type 4 Q12-app type 5
## 1      0      0      0      0      0
## 2      1      0      0      0      0
## 3      0      0      1      0      0
## 4      0      0      1      0      0
## 5      0      0      0      0      0
## 6      0      0      0      0      0
## Q12-app type 6 Q12-app type 7 Q14-tool type 1 Q14-tool type 2 Q14-tool type 3
## 1      0      0      0      0      1
## 2      0      0      1      0      0
## 3      0      0      0      0      0
## 4      0      0      0      0      1
## 5      0      0      0      0      0
## 6      0      0      0      0      0
## Q14-tool type 4 Q14-tool type 5 Q14-tool type 6 Q15-Language 1-Primary
## 1      0      0      0      1
## 2      0      0      0      0
## 3      0      0      0      0
## 4      0      0      0      0
## 5      0      0      0      1
## 6      0      0      0      0
## Q15-Language 1-Also using Q15-Language 2-Primary Q15-Language 2-Also using
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q15-Language 3-Primary Q15-Language 3-Also using Q15-Language 4-Primary
## 1      0      0      0
## 2      1      0      0
## 3      0      0      0
## 4      0      1      0
## 5      0      0      0
## 6      0      0      0
## Q15-Language 4-Also using Q15-Language 5-Primary Q15-Language 5-Also using
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      1      0      0
## 5      0      0      0
## 6      0      0      0
## Q15-Language 6-Primary Q15-Language 6-Also using
## 1      0      0
## 2      0      0
## 3      0      0
## 4      0      0
## 5      0      0
## 6      0      0

```

Next we eliminate respondents that did not select platform 1 primary


```
plat.1.primary.selected <- plat.1.primary[plat.1.primary$`Q10-Platform 1-Primary`!=0 ,]  
View(plat.1.primary.selected)  
head(plat.1.primary.selected)
```

```

##      ResponseID Q2 Involvement in development (types 81 to 89)
## 8   R_agj3m9SYCOL2qMd      83
## 11  R_8jqspSL0TZ3ljKt      85
## 28  R_cHJ7TzxGxr7Vsdn      84
## 29  R_b31fAGBy1K5X0eh      85
## 38  R_0DmpCWZkW20oc9T      82
## 40  R_b1NBCPgpKdgFZ0d      85
##      Q3 Company size (ranges, from 1 smallest to 8 largest) Q5-Role 1 Q5-Role 2
## 8      NA      1      1
## 11      8      0      0
## 28      2      0      1
## 29      3      1      0
## 38      NA      1      0
## 40      4      0      0
##      Q5-Role 3 Q5-Role 4 Q5-Role 5 Q6 Experience Q10-Platform 1-Primary
## 8      1      1      0      5      1
## 11      0      0      0      NA      1
## 28      0      0      0      3      1
## 29      0      0      0      6      1
## 38      0      0      0      4      1
## 40      0      0      0      6      1
##      Q12-app type 1 Q12-app type 2 Q12-app type 3 Q12-app type 4 Q12-app type 5
## 8      0      0      0      0      0
## 11      0      0      0      1      0
## 28      0      0      0      0      0
## 29      0      0      0      1      1
## 38      1      0      0      0      0
## 40      0      0      0      0      0
##      Q12-app type 6 Q12-app type 7 Q14-tool type 1 Q14-tool type 2
## 8      1      0      0      0
## 11      1      0      0      0
## 28      0      0      0      0
## 29      0      0      1      0
## 38      0      0      0      1
## 40      0      0      0      0
##      Q14-tool type 3 Q14-tool type 4 Q14-tool type 5 Q14-tool type 6
## 8      0      0      0      0
## 11      0      0      0      0
## 28      1      0      0      0
## 29      0      0      1      0
## 38      0      0      0      0
## 40      0      0      0      0
##      Q15-Language 1-Primary Q15-Language 1-Also using Q15-Language 2-Primary
## 8      0      0      0
## 11      0      1      0
## 28      0      0      0
## 29      1      0      0
## 38      0      0      0
## 40      1      0      0
##      Q15-Language 2-Also using Q15-Language 3-Primary Q15-Language 3-Also using
## 8      0      0      0
## 11      0      1      0
## 28      0      0      0
## 29      0      0      0
## 38      0      0      1
## 40      0      0      1
##      Q15-Language 4-Primary Q15-Language 4-Also using Q15-Language 5-Primary
## 8      1      0      0
## 11      0      0      0
## 28      0      0      0
## 29      0      0      0
## 38      1      0      0
## 40      0      0      0
##      Q15-Language 5-Also using Q15-Language 6-Primary Q15-Language 6-Also using
## 8      0      0      0
## 11      0      0      0
## 28      0      1      0
## 29      1      0      0
## 38      1      0      0
## 40      0      0      0

```

Aggregate columns based on platform 1 primary

```
plat.1.summary<- aggregate(plat.1.primary.selected[, -c(1,2,3,9,10)],by=list(plat.1.primary.selected$`Q10-Platform 1-Primary`),FUN=sum)
head(plat.1.summary)
```

```
## Group.1 Q5-Role 1 Q5-Role 2 Q5-Role 3 Q5-Role 4 Q5-Role 5 Q12-app type 1
## 1      1      1514      1085      503      959      430      892
## Q12-app type 2 Q12-app type 3 Q12-app type 4 Q12-app type 5 Q12-app type 6
## 1      450      703      678      515      513
## Q12-app type 7 Q14-tool type 1 Q14-tool type 2 Q14-tool type 3
## 1      719      993      645      567
## Q14-tool type 4 Q14-tool type 5 Q14-tool type 6 Q15-Language 1-Primary
## 1      506      540      727      1590
## Q15-Language 1-Also using Q15-Language 2-Primary Q15-Language 2-Also using
## 1      460      11      110
## Q15-Language 3-Primary Q15-Language 3-Also using Q15-Language 4-Primary
## 1      375      758      113
## Q15-Language 4-Also using Q15-Language 5-Primary Q15-Language 5-Also using
## 1      261      216      483
## Q15-Language 6-Primary Q15-Language 6-Also using
## 1      276      254
```

```
colnames(plat.1.summary)[1] <- "Platfrom.1.Primary"
plat.1.summary$Platfrom.1.Primary <- toString(plat.1.summary$Platfrom.1.Primary)
plat.1.summary$Platfrom.1.Primary <- c("Platform.1.Primary")
head(plat.1.summary)
```

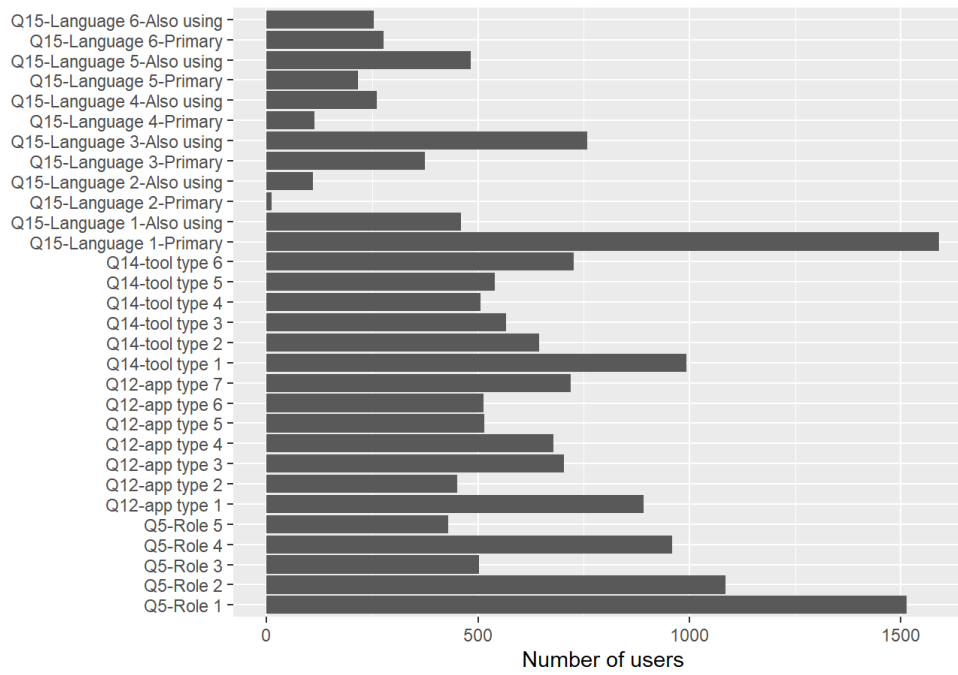
```
## Platfrom.1.Primary Q5-Role 1 Q5-Role 2 Q5-Role 3 Q5-Role 4 Q5-Role 5
## 1 Platform.1.Primary      1514      1085      503      959      430
## Q12-app type 1 Q12-app type 2 Q12-app type 3 Q12-app type 4 Q12-app type 5
## 1      892      450      703      678      515
## Q12-app type 6 Q12-app type 7 Q14-tool type 1 Q14-tool type 2 Q14-tool type 3
## 1      513      719      993      645      567
## Q14-tool type 4 Q14-tool type 5 Q14-tool type 6 Q15-Language 1-Primary
## 1      506      540      727      1590
## Q15-Language 1-Also using Q15-Language 2-Primary Q15-Language 2-Also using
## 1      460      11      110
## Q15-Language 3-Primary Q15-Language 3-Also using Q15-Language 4-Primary
## 1      375      758      113
## Q15-Language 4-Also using Q15-Language 5-Primary Q15-Language 5-Also using
## 1      261      216      483
## Q15-Language 6-Primary Q15-Language 6-Also using
## 1      276      254
```

```
plat.1.summary.plot<- melt(plat.1.summary,id.vars="Platfrom.1.Primary")
```

Finally, we plot our data

```
ggplot(data = plat.1.summary.plot, aes( x = variable, y = value) ) + # print bar chart
  geom_bar( stat = 'identity',position = position_dodge(width = 100))+
  #geom_col( stat = 'identity', width =0.8, position = position_dodge(0.8) )+
  #theme(axis.text.x = element_text(margin = unit(c(0, 0, 0, 0), "mm"), angle = 90))+
  coord_flip()+
  scale_x_discrete("")+
  labs(y="Number of users",title="Platform 1 primary users",fill="")
```

Platform 1 primary users



Similarly, we first obtain data for platform 3 primary users from our data table.

```
head(data)
```

```

##      ResponseID Q2 Involvement in development (types 81 to 89)
## 1 R_aXE7seqJu0LmVFz      85
## 2 R_5vVjAI7X7mjFv5r      84
## 3 R_06sqswy5R4sV8s1      85
## 4 R_2rjuFIvBirJRKnz      85
## 5 R_7UM1Gsr1ye3db49      85
## 6 R_01cRgkoaxMbaHc1      89
## Q3 Company size (ranges, from 1 smallest to 8 largest) Q5-Role 1 Q5-Role 2
## 1      4      0      0
## 2      1      0      1
## 3      2      1      0
## 4      5      1      0
## 5      5      1      0
## 6      7      1      0
## Q5-Role 3 Q5-Role 4 Q5-Role 5 Q6 Experience Q10-Platform 1-Primary
## 1      0      1      0      6      0
## 2      1      1      0      4      0
## 3      0      0      0      3      0
## 4      0      0      0      6      0
## 5      0      0      0      4      0
## 6      0      0      0      3      0
## Q10-Platform 1-Secondary Q10-Platform 1-Third Q10-Platform 2-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 2-Secondary Q10-Platform 2-Third Q10-Platform 3-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 3-Secondary Q10-Platform 3-Third Q10-Platform 4-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 4-Secondary Q10-Platform 4-Third Q12-app type 1 Q12-app type 2
## 1      0      0      0      0
## 2      0      0      1      0
## 3      0      0      0      0
## 4      0      0      0      0
## 5      0      0      0      0
## 6      0      0      0      0
## Q12-app type 3 Q12-app type 4 Q12-app type 5 Q12-app type 6 Q12-app type 7
## 1      0      0      0      0      0
## 2      0      0      0      0      0
## 3      1      0      0      0      0
## 4      1      0      0      0      0
## 5      0      0      0      0      0
## 6      0      0      0      0      0
## Q14-tool type 1 Q14-tool type 2 Q14-tool type 3 Q14-tool type 4
## 1      0      0      1      0
## 2      1      0      0      0
## 3      0      0      0      0
## 4      0      0      1      0
## 5      0      0      0      0
## 6      0      0      0      0
## Q14-tool type 5 Q14-tool type 6 Q15-Language 1-Primary
## 1      0      0      1
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      1
## 6      0      0      0
## Q15-Language 1-Also using Q15-Language 2-Primary Q15-Language 2-Also using
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0

```

## 4	0	0	0
## 5	0	0	0
## 6	0	0	0
## Q15-Language 3-Primary	Q15-Language 3-Also using	Q15-Language 4-Primary	
## 1	0	0	0
## 2	1	0	0
## 3	0	0	0
## 4	0	1	0
## 5	0	0	0
## 6	0	0	0
## Q15-Language 4-Also using	Q15-Language 5-Primary	Q15-Language 5-Also using	
## 1	0	0	0
## 2	0	0	0
## 3	0	0	0
## 4	1	0	0
## 5	0	0	0
## 6	0	0	0
## Q15-Language 6-Primary	Q15-Language 6-Also using		
## 1	0	0	
## 2	0	0	
## 3	0	0	
## 4	0	0	
## 5	0	0	
## 6	0	0	

```
plat.3.primary <- data[,c(-(10:15),-(17:21))]
head(plat.3.primary)
```

```

##      ResponseID Q2 Involvement in development (types 81 to 89)
## 1 R_aXE7seqJu0LmVFz      85
## 2 R_5vVjAI7X7mjFv5r      84
## 3 R_06sqswy5R4sV8s1      85
## 4 R_2rjuFIvBirJRKnz      85
## 5 R_7UM1Gsr1ye3db49      85
## 6 R_01cRgkoaxMbaHc1      89
## Q3 Company size (ranges, from 1 smallest to 8 largest) Q5-Role 1 Q5-Role 2
## 1      4      0      0
## 2      1      0      1
## 3      2      1      0
## 4      5      1      0
## 5      5      1      0
## 6      7      1      0
## Q5-Role 3 Q5-Role 4 Q5-Role 5 Q6 Experience Q10-Platform 3-Primary
## 1      0      1      0      6      0
## 2      1      1      0      4      0
## 3      0      0      0      3      0
## 4      0      0      0      6      0
## 5      0      0      0      4      0
## 6      0      0      0      3      0
## Q12-app type 1 Q12-app type 2 Q12-app type 3 Q12-app type 4 Q12-app type 5
## 1      0      0      0      0      0
## 2      1      0      0      0      0
## 3      0      0      1      0      0
## 4      0      0      1      0      0
## 5      0      0      0      0      0
## 6      0      0      0      0      0
## Q12-app type 6 Q12-app type 7 Q14-tool type 1 Q14-tool type 2 Q14-tool type 3
## 1      0      0      0      0      1
## 2      0      0      1      0      0
## 3      0      0      0      0      0
## 4      0      0      0      0      1
## 5      0      0      0      0      0
## 6      0      0      0      0      0
## Q14-tool type 4 Q14-tool type 5 Q14-tool type 6 Q15-Language 1-Primary
## 1      0      0      0      1
## 2      0      0      0      0
## 3      0      0      0      0
## 4      0      0      0      0
## 5      0      0      0      1
## 6      0      0      0      0
## Q15-Language 1-Also using Q15-Language 2-Primary Q15-Language 2-Also using
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q15-Language 3-Primary Q15-Language 3-Also using Q15-Language 4-Primary
## 1      0      0      0
## 2      1      0      0
## 3      0      0      0
## 4      0      1      0
## 5      0      0      0
## 6      0      0      0
## Q15-Language 4-Also using Q15-Language 5-Primary Q15-Language 5-Also using
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      1      0      0
## 5      0      0      0
## 6      0      0      0
## Q15-Language 6-Primary Q15-Language 6-Also using
## 1      0      0
## 2      0      0
## 3      0      0
## 4      0      0
## 5      0      0
## 6      0      0

```

Next we eliminate respondents that did not select platform 3

```
plat.3.primary.selected <- plat.3.primary[plat.3.primary$`Q10-Platform 3-Primary`!=0 ,]  
View(plat.3.primary.selected)  
head(plat.3.primary.selected)
```


##	ResponseID	Q2 Involvement in development (types 81 to 89)			
## 42	R_5B8CCqQIaaXza4Z		85		
## 64	R_55x1QIaQ5KvRiSh		84		
## 81	R_3gj2cumz7S1ZgNL		83		
## 86	R_0MU3VakMeeygrm1		86		
## 117	R_0oAtRcQo7CuAftP		82		
## 143	R_9TFp63rZ2xcLVK5		83		
##	Q3 Company size (ranges, from 1 smallest to 8 largest)	Q5-Role 1	Q5-Role 2		
## 42		6	1	1	
## 64		2	0	0	
## 81		NA	0	1	
## 86		8	0	0	
## 117		NA	0	1	
## 143		NA	0	1	
##	Q5-Role 3	Q5-Role 4	Q5-Role 5	Q6 Experience	Q10-Platform 3-Primary
## 42	0	0	0	6	1
## 64	0	0	0	6	1
## 81	1	1	0	4	1
## 86	0	0	0	3	1
## 117	1	0	0	6	1
## 143	1	1	0	6	1
##	Q12-app type 1	Q12-app type 2	Q12-app type 3	Q12-app type 4	Q12-app type 5
## 42	1	1	1	1	1
## 64	0	0	0	0	0
## 81	1	0	0	0	0
## 86	0	0	0	0	0
## 117	0	0	0	0	0
## 143	0	0	1	0	0
##	Q12-app type 6	Q12-app type 7	Q14-tool type 1	Q14-tool type 2	
## 42	1	1	0	0	
## 64	0	0	0	0	
## 81	0	0	0	0	
## 86	0	0	0	0	
## 117	0	0	0	0	
## 143	0	0	0	0	
##	Q14-tool type 3	Q14-tool type 4	Q14-tool type 5	Q14-tool type 6	
## 42	0	0	0	0	
## 64	0	0	0	0	
## 81	0	0	0	0	
## 86	1	0	0	0	
## 117	0	0	0	0	
## 143	0	0	0	0	
##	Q15-Language 1-Primary	Q15-Language 1-Also using	Q15-Language 2-Primary		
## 42	0	0	0		
## 64	0	0	0		
## 81	0	0	0		
## 86	0	0	0		
## 117	0	1	0		
## 143	0	0	0		
##	Q15-Language 2-Also using	Q15-Language 3-Primary	Q15-Language 3-Also using		
## 42	0	1	0		
## 64	0	0	0		
## 81	0	1	0		
## 86	0	1	0		
## 117	0	1	0		
## 143	0	0	1		
##	Q15-Language 4-Primary	Q15-Language 4-Also using	Q15-Language 5-Primary		
## 42	0	0	0		
## 64	0	0	0		
## 81	0	0	0		
## 86	0	0	0		
## 117	0	0	0		
## 143	0	0	0		
##	Q15-Language 5-Also using	Q15-Language 6-Primary	Q15-Language 6-Also using		
## 42	0	0	0		
## 64	0	0	0		
## 81	0	0	0		
## 86	0	0	0		
## 117	0	0	0		
## 143	0	0	0		

Aggregate columns based on platform 3 primary

```
plat.3.summary<- aggregate(plat.3.primary.selected[, -c(1,2,3,9,10)],by=list(plat.3.primary.selected$`Q10-Platform 3-Primary`),FUN=sum)
head(plat.3.summary)
```

```
## Group.1 Q5-Role 1 Q5-Role 2 Q5-Role 3 Q5-Role 4 Q5-Role 5 Q12-app type 1
## 1      1      196      162      55      107      39      52
## Q12-app type 2 Q12-app type 3 Q12-app type 4 Q12-app type 5 Q12-app type 6
## 1      77      128      87      44      61
## Q12-app type 7 Q14-tool type 1 Q14-tool type 2 Q14-tool type 3
## 1      57      53      29      83
## Q14-tool type 4 Q14-tool type 5 Q14-tool type 6 Q15-Language 1-Primary
## 1      45      61      70      17
## Q15-Language 1-Also using Q15-Language 2-Primary Q15-Language 2-Also using
## 1      69      0      23
## Q15-Language 3-Primary Q15-Language 3-Also using Q15-Language 4-Primary
## 1      234      98      45
## Q15-Language 4-Also using Q15-Language 5-Primary Q15-Language 5-Also using
## 1      72      12      27
## Q15-Language 6-Primary Q15-Language 6-Also using
## 1      15      43
```

```
colnames(plat.3.summary)[1] <- "Platfrom.3.Primary"
plat.3.summary$Platfrom.3.Primary <- toString(plat.3.summary$Platfrom.3.Primary)
plat.3.summary$Platfrom.3.Primary <- c("Platform.3.Primary")
head(plat.3.summary)
```

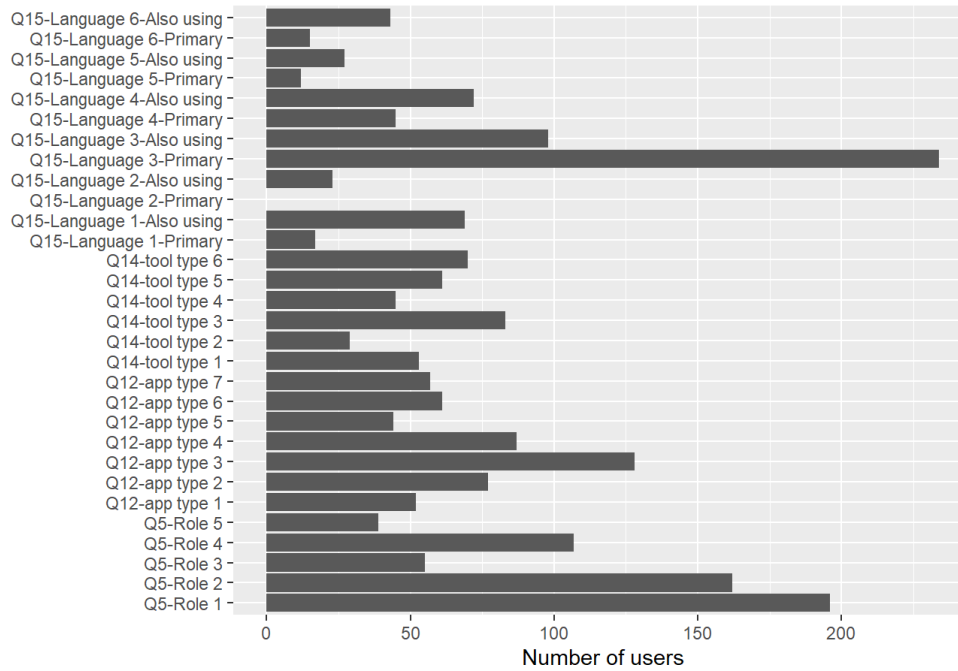
```
## Platfrom.3.Primary Q5-Role 1 Q5-Role 2 Q5-Role 3 Q5-Role 4 Q5-Role 5
## 1 Platform.3.Primary      196      162      55      107      39
## Q12-app type 1 Q12-app type 2 Q12-app type 3 Q12-app type 4 Q12-app type 5
## 1      52      77      128      87      44
## Q12-app type 6 Q12-app type 7 Q14-tool type 1 Q14-tool type 2 Q14-tool type 3
## 1      61      57      53      29      83
## Q14-tool type 4 Q14-tool type 5 Q14-tool type 6 Q15-Language 1-Primary
## 1      45      61      70      17
## Q15-Language 1-Also using Q15-Language 2-Primary Q15-Language 2-Also using
## 1      69      0      23
## Q15-Language 3-Primary Q15-Language 3-Also using Q15-Language 4-Primary
## 1      234      98      45
## Q15-Language 4-Also using Q15-Language 5-Primary Q15-Language 5-Also using
## 1      72      12      27
## Q15-Language 6-Primary Q15-Language 6-Also using
## 1      15      43
```

```
plat.3.summary.plot<- melt(plat.3.summary,id.vars="Platfrom.3.Primary")
```

Finally, we plot our data

```
ggplot(data = plat.3.summary.plot, aes( x = variable, y = value) ) + # print bar chart
  geom_bar( stat = 'identity',position = position_dodge(width = 100))+
  #geom_col( stat = 'identity', width =0.8, position = position_dodge(0.8) )+
  #theme(axis.text.x = element_text(margin = unit(c(0, 0, 0, 0), "mm"), angle = 90))+
  coord_flip()+
  scale_x_discrete("")+
  labs(y="Number of users",title="Platform 3 primary users",fill="")
```

Platform 3 primary users



Inspecting both plots, we note that both platform 1 and 3 primary users are most likely to be in role 1. However, in contrast Platform 1 primary users opted for Language 1 as their most used language whereas platform 3 users opted for language 3.

Involvement in development and company size

Define a new data table

```
Dev.comp.size.data <- data[,c(1:3,10:21)]
head(Dev.comp.size.data)
```

```
##      ResponseID Q2 Involvement in development (types 81 to 89)
## 1 R_aXE7seqJu0LmVFz      85
## 2 R_5vVjAI7X7mjFv5r      84
## 3 R_06sqswy5R4sV8s1      85
## 4 R_2rjuFIvBirJRKnz      85
## 5 R_7UM1Gsr1ye3db49      85
## 6 R_01cRgkoaxMbaHc1      89
## Q3 Company size (ranges, from 1 smallest to 8 largest) Q10-Platform 1-Primary
## 1      4      0
## 2      1      0
## 3      2      0
## 4      5      0
## 5      5      0
## 6      7      0
## Q10-Platform 1-Secondary Q10-Platform 1-Third Q10-Platform 2-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 2-Secondary Q10-Platform 2-Third Q10-Platform 3-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 3-Secondary Q10-Platform 3-Third Q10-Platform 4-Primary
## 1      0      0      0
## 2      0      0      0
## 3      0      0      0
## 4      0      0      0
## 5      0      0      0
## 6      0      0      0
## Q10-Platform 4-Secondary Q10-Platform 4-Third
## 1      0      0
## 2      0      0
## 3      0      0
## 4      0      0
## 5      0      0
## 6      0      0
```

Reshaping the data to convert into a long format based on the platforms we have

```
Dev.comp.size.data.stacked <- melt( data = Dev.comp.size.data , id.vars = c('ResponseID','Q2 Involvement in development (types 81 to 89)',
                                                                    'Q3 Company size (ranges, from 1 smallest to 8 largest)'))
head(Dev.comp.size.data.stacked)
```

```
##      ResponseID Q2 Involvement in development (types 81 to 89)
## 1 R_aXE7seqJu0LmVFz      85
## 2 R_5vVjAI7X7mjFv5r      84
## 3 R_06sqswy5R4sV8s1      85
## 4 R_2rjuFIvBirJRKnz      85
## 5 R_7UM1Gsr1ye3db49      85
## 6 R_01cRgkoaxMbaHc1      89
## Q3 Company size (ranges, from 1 smallest to 8 largest)      variable
## 1      4 Q10-Platform 1-Primary
## 2      1 Q10-Platform 1-Primary
## 3      2 Q10-Platform 1-Primary
## 4      5 Q10-Platform 1-Primary
## 5      5 Q10-Platform 1-Primary
## 6      7 Q10-Platform 1-Primary
## value
## 1      0
## 2      0
## 3      0
## 4      0
## 5      0
## 6      0
```

```
View(Dev.comp.size.data.stacked)
```

Now reshaping again, but this time into aggregated format based on development involvement type. Note that I had to rename columns in the table since the space was causing error for the dcast() function.

```
colnames(Dev.comp.size.data.stacked)[2:3] <- c("Dev.type","Comp.size")
Dev.type.aggregated <- dcast( Dev.comp.size.data.stacked,Dev.type~variable , value.var = 'value', fun.aggregate = sum)
Comp.size.aggregated <- dcast( Dev.comp.size.data.stacked,Comp.size~variable , value.var = 'value', fun.aggregate = sum)
head(Dev.type.aggregated)
```

```
##   Dev.type Q10-Platform 1-Primary Q10-Platform 1-Secondary Q10-Platform 1-Third
## 1      81                0                0                0
## 2      82             1002                342             136
## 3      83              632                253             101
## 4      84              400                219              67
## 5      85              713                425             119
## 6      86              195                113              41
##   Q10-Platform 2-Primary Q10-Platform 2-Secondary Q10-Platform 2-Third
## 1                0                0                0
## 2              227              192              65
## 3              194              168              75
## 4              240              151              53
## 5              449              362             130
## 6              132              112              29
##   Q10-Platform 3-Primary Q10-Platform 3-Secondary Q10-Platform 3-Third
## 1                0                0                0
## 2              80              45              40
## 3              74              55              31
## 4              22              24              28
## 5             149              47              87
## 6              56              16              25
##   Q10-Platform 4-Primary Q10-Platform 4-Secondary Q10-Platform 4-Third
## 1                0                0                0
## 2             1708              212              65
## 3             691              146              57
## 4             328              81              76
## 5             326             140             130
## 6              93              31              34
```

```
head(Comp.size.aggregated)
```

```
##   Comp.size Q10-Platform 1-Primary Q10-Platform 1-Secondary
## 1         1           227           101
## 2         2           249           162
## 3         3           288           191
## 4         4           188            83
## 5         5           267           131
## 6         6           139            82
##   Q10-Platform 1-Third Q10-Platform 2-Primary Q10-Platform 2-Secondary
## 1                46                113                79
## 2                44                182                108
## 3                35                199                156
## 4                21                 82                 89
## 5                49                158                123
## 6                20                 89                 77
##   Q10-Platform 2-Third Q10-Platform 3-Primary Q10-Platform 3-Secondary
## 1                21                 13                 13
## 2                43                 32                 19
## 3                48                 48                 20
## 4                25                 36                  4
## 5                42                 60                 20
## 6                30                 33                  6
##   Q10-Platform 3-Third Q10-Platform 4-Primary Q10-Platform 4-Secondary
## 1                12                242                 54
## 2                30                125                 49
## 3                34                 95                 45
## 4                17                 62                 34
## 5                33                111                 51
## 6                17                 72                 20
##   Q10-Platform 4-Third
## 1                33
## 2                44
## 3                67
## 4                25
## 5                52
## 6                26
```

To obtain the total usage for each platform, we sum the rows as shown below

```
Plat.1 <- rowSums(Dev.type.aggregated[,2:4])
Plat.1 <- rowSums(Comp.size.aggregated[,2:4])
Plat.2 <- rowSums(Dev.type.aggregated[,5:7])
Plat.2 <- rowSums(Comp.size.aggregated[,5:7])
Plat.3 <- rowSums(Dev.type.aggregated[,8:10])
Plat.3 <- rowSums(Comp.size.aggregated[,8:10])
Plat.4 <- rowSums(Dev.type.aggregated[,11:13])
Plat.4 <- rowSums(Comp.size.aggregated[,11:13])
```

We then design 2 new data frames with the involvement in development type column in one, and company size column for the other. The total usage per platform columns are also added to each data frame

```
Dev.type.total.usage <- data.frame(Dev.type.aggregated$Dev.type,Plat.1,Plat.2,Plat.3,Plat.4)
Comp.size.total.usage <- data.frame(Comp.size.aggregated$Comp.size,Plat.1,Plat.2,Plat.3,Plat.4)
colnames(Dev.type.total.usage)[1] <- "Dev.type"
colnames(Comp.size.total.usage)[1] <- "Comp.size"
head(Dev.type.total.usage)
```

```
##   Dev.type Plat.1 Plat.2 Plat.3 Plat.4
## 1      81    374    213     38    329
## 2      82    455    333     81    218
## 3      83    514    403    102    207
## 4      84    292    196     57    121
## 5      85    447    323    113    214
## 6      86    241    196     56    118
```

```
head(Comp.size.total.usage)
```

```
##   Comp.size Plat.1 Plat.2 Plat.3 Plat.4
## 1         1    374    213     38    329
## 2         2    455    333     81    218
## 3         3    514    403    102    207
## 4         4    292    196     57    121
## 5         5    447    323    113    214
## 6         6    241    196     56    118
```

```
Dev.type.total.usage.stacked <- melt( data = Dev.type.total.usage , id.vars ="Dev.type")
head(Dev.type.total.usage.stacked)
```

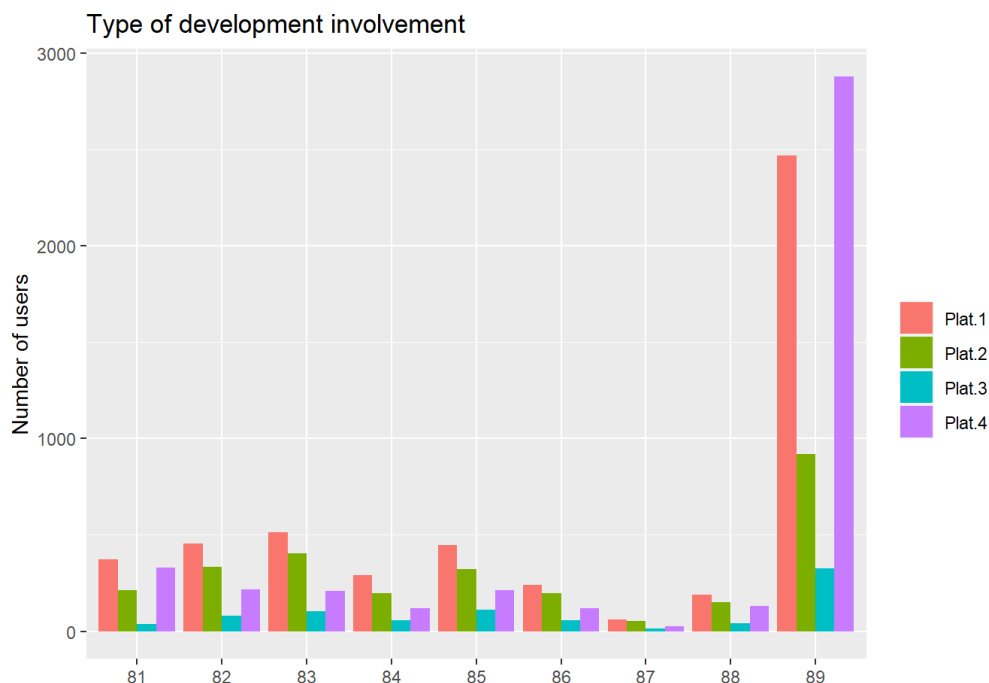
```
##   Dev.type variable value
## 1        81   Plat.1   374
## 2        82   Plat.1   455
## 3        83   Plat.1   514
## 4        84   Plat.1   292
## 5        85   Plat.1   447
## 6        86   Plat.1   241
```

```
Comp.size.total.usage.stacked <- melt( data = Comp.size.total.usage , id.vars ="Comp.size")
head(Comp.size.total.usage.stacked)
```

```
##   Comp.size variable value
## 1         1   Plat.1   374
## 2         2   Plat.1   455
## 3         3   Plat.1   514
## 4         4   Plat.1   292
## 5         5   Plat.1   447
## 6         6   Plat.1   241
```

Finally, we are ready to make our plots. First, we plot the involvement in development type bar chart

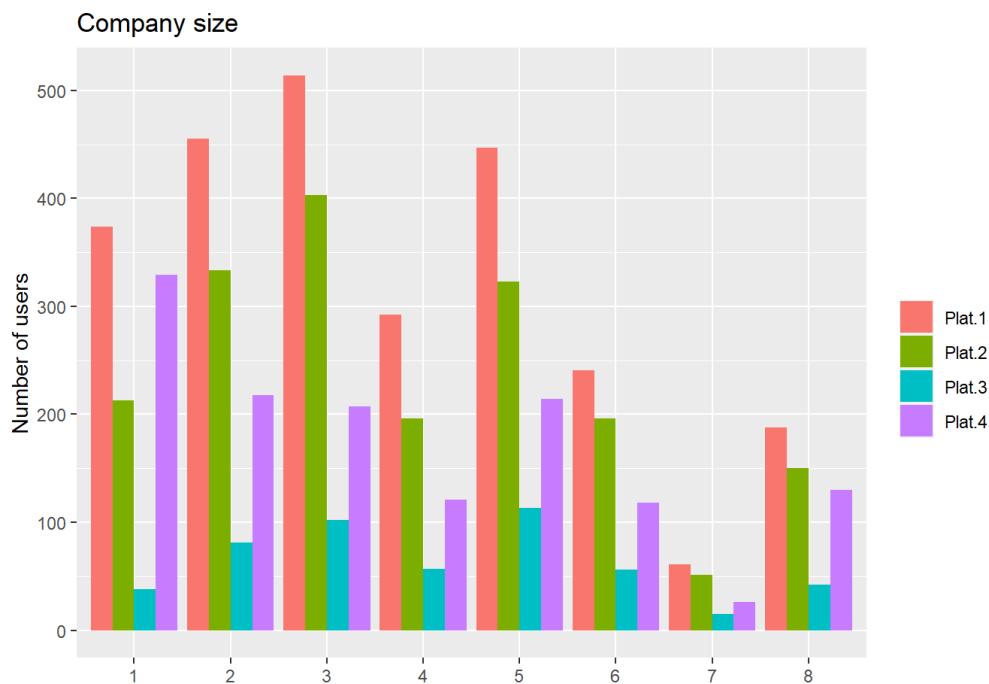
```
ggplot(data = Dev.type.total.usage.stacked, aes( x = factor( Dev.type ), y = value, fill = variable ) ) + # print bar chart
  geom_bar( stat = 'identity', position = 'dodge' )+
  scale_x_discrete("")+
  labs(y="Number of users",title="Type of development involvement",fill="")
```



We note that most respondent were involved in type 89 development, particularly with platform 1 and 4 users.

Then make our the second plot, for the company size bar chart

```
ggplot(data =subset(Comp.size.total.usage.stacked,!is.na(Comp.size)), aes( x = factor( Comp.size ), y = value, fill = variable )) + # print bar chart
  geom_bar( stat = 'identity', position = 'dodge' )+
  scale_x_discrete("")+
  labs(y="Number of users",title="Company size",fill="")
```



Majority of platform users are based in small to mid-sized companies, ranging from 1-5 with platform 1 constituting the largest share of platform usage in the respective companies. We also note that for large companies size 7-8, the number of platform users is considerably less.

Investigating respondent's role data

Respondents had 5 roles to choose from. It appears that respondents can choose more than 1 role at a time. Extracting the appropriate columns we have

```
role.data <-data[,c(1,4:8,10:21)]
head(role.data)
```



```
##      ResponseID Q5-Role 1 Q5-Role 2 Q5-Role 3 Q5-Role 4 Q5-Role 5
## 1 R_aXE7seqJu0LmVFz      0      0      0      1      0
## 2 R_5vVjAI7X7mjFv5r      0      1      1      1      0
## 3 R_06sqswy5R4sV8s1      1      0      0      0      0
## 4 R_2rjuFIvBirJRKnz      1      0      0      0      0
## 5 R_7UM1Gsr1ye3db49      1      0      0      0      0
## 6 R_01cRgkoaxMbaHc1      1      0      0      0      0
##   Q10-Platform 1-Primary Q10-Platform 1-Secondary Q10-Platform 1-Third
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##   Q10-Platform 2-Primary Q10-Platform 2-Secondary Q10-Platform 2-Third
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##   Q10-Platform 3-Primary Q10-Platform 3-Secondary Q10-Platform 3-Third
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##   Q10-Platform 4-Primary Q10-Platform 4-Secondary Q10-Platform 4-Third
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
```

Reshaping the data in long format collapsing the different platform columns as shown below

```
role.data.long <- melt(role.data,id.vars=colnames(role.data)[1:6])
head(role.data.long)
```

```
##      ResponseID Q5-Role 1 Q5-Role 2 Q5-Role 3 Q5-Role 4 Q5-Role 5
## 1 R_aXE7seqJu0LmVFz      0      0      0      1      0
## 2 R_5vVjAI7X7mjFv5r      0      1      1      1      0
## 3 R_06sqswy5R4sV8s1      1      0      0      0      0
## 4 R_2rjuFIvBirJRKnz      1      0      0      0      0
## 5 R_7UM1Gsr1ye3db49      1      0      0      0      0
## 6 R_01cRgkoaxMbaHc1      1      0      0      0      0
##      variable value
## 1 Q10-Platform 1-Primary      0
## 2 Q10-Platform 1-Primary      0
## 3 Q10-Platform 1-Primary      0
## 4 Q10-Platform 1-Primary      0
## 5 Q10-Platform 1-Primary      0
## 6 Q10-Platform 1-Primary      0
```

```
View(role.data.long)
```

To obtain respondent's data that selected "yes", which is 1, for a role and a platform usage type e.g. Platform 1-Primary. We eliminate rows with 0 entry in the value column above i.e. entries where a platform usage has been selected.

```
role.data.long.selected.plat <- role.data.long[role.data.long$value!=0,]
role.data.long.selected.plat <- melt(role.data.long.selected.plat,id.vars=c("ResponseID","variable","value"))
head(role.data.long.selected.plat)
```

```
##      ResponseID      variable value  variable value
## 1 R_agj3m9SYCOL2qMd Q10-Platform 1-Primary    1 Q5-Role 1    1
## 2 R_8jqspSL0TZ3ljKt Q10-Platform 1-Primary    1 Q5-Role 1    0
## 3 R_cHJ7TzxGxr7Vsdn Q10-Platform 1-Primary    1 Q5-Role 1    0
## 4 R_b3lfAGBy1K5XOeh Q10-Platform 1-Primary    1 Q5-Role 1    1
## 5 R_0DmpCWZkKw2Oc9T Q10-Platform 1-Primary    1 Q5-Role 1    1
## 6 R_b1NBCPgpKdgFZ0d Q10-Platform 1-Primary    1 Q5-Role 1    0
```

```
colnames(role.data.long.selected.plat)[2:3]=c("Plat.usage", "Plat.selected")
View(role.data.long.selected.plat)
head(role.data.long.selected.plat)
```

```
##      ResponseID      Plat.usage Plat.selected  variable value
## 1 R_agj3m9SYCOL2qMd Q10-Platform 1-Primary    1 Q5-Role 1    1
## 2 R_8jqspSL0TZ3ljKt Q10-Platform 1-Primary    1 Q5-Role 1    0
## 3 R_cHJ7TzxGxr7Vsdn Q10-Platform 1-Primary    1 Q5-Role 1    0
## 4 R_b3lfAGBy1K5XOeh Q10-Platform 1-Primary    1 Q5-Role 1    1
## 5 R_0DmpCWZkKw2Oc9T Q10-Platform 1-Primary    1 Q5-Role 1    1
## 6 R_b1NBCPgpKdgFZ0d Q10-Platform 1-Primary    1 Q5-Role 1    0
```

Now we eliminate the roles not selected, so we end up with selected platforms and roles.

```
role.data.long.selected.all <- role.data.long.selected.plat[role.data.long.selected.plat$value!=0,]
View(role.data.long.selected.all)
role.data.wide <- dcast(role.data.long.selected.all, variable~Plat.usage , value.var = 'value', fun.aggregate = sum)
View(role.data.wide)
head(role.data.wide)
```

```
##      variable Q10-Platform 1-Primary Q10-Platform 1-Secondary
## 1 Q5-Role 1      1514      644
## 2 Q5-Role 2      1085      588
## 3 Q5-Role 3       503      286
## 4 Q5-Role 4       959      423
## 5 Q5-Role 5       430      247
##      Q10-Platform 1-Third Q10-Platform 2-Primary Q10-Platform 2-Secondary
## 1      243      546      465
## 2      249      543      429
## 3       94      303      202
## 4      172      359      272
## 5       78      252      145
##      Q10-Platform 2-Third Q10-Platform 3-Primary Q10-Platform 3-Secondary
## 1      184      196      105
## 2      176      162      104
## 3       71       55       51
## 4      114      107       71
## 5       54       39       37
##      Q10-Platform 3-Third Q10-Platform 4-Primary Q10-Platform 4-Secondary
## 1      101      1576      343
## 2       89      1197      279
## 3       62       529      116
## 4       68      1307      233
## 5       39       495       97
##      Q10-Platform 4-Third
## 1      153
## 2      166
## 3       85
## 4      113
## 5       65
```

Expressing the data table in long format ready for plotting

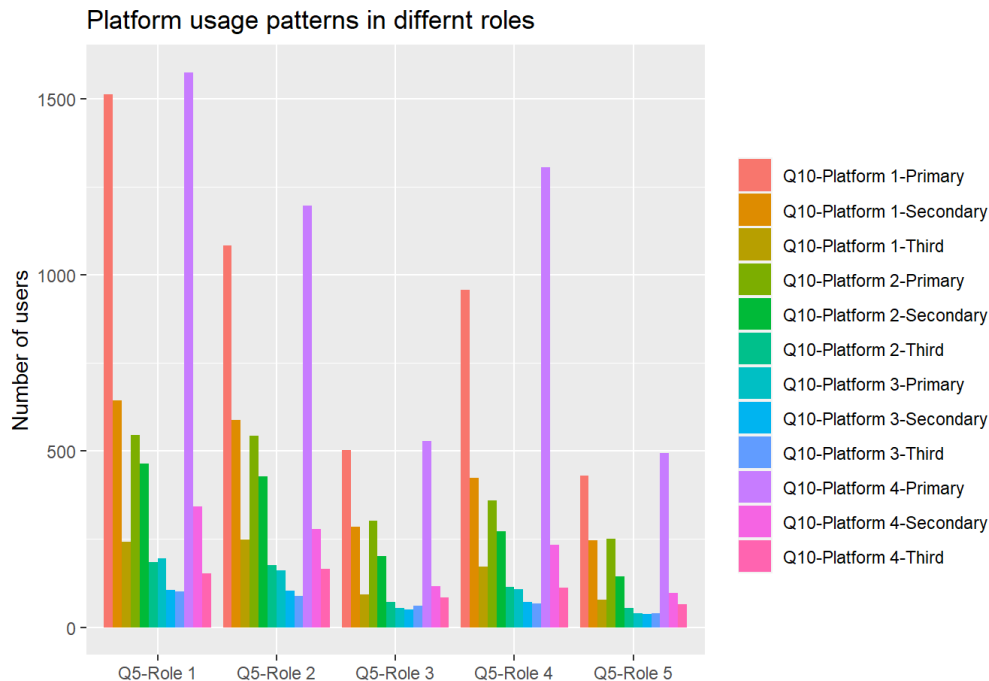
```
role.data.barchart <- melt(role.data.wide,id.vars="variable")
View(role.data.barchart)
```

Making changes to column names and plotting, we have

```
colnames(role.data.barchart)=c("Roles", "variable", "value")
head(role.data.barchart)
```

```
##      Roles                variable value
## 1 Q5-Role 1   Q10-Platform 1-Primary 1514
## 2 Q5-Role 2   Q10-Platform 1-Primary 1085
## 3 Q5-Role 3   Q10-Platform 1-Primary  503
## 4 Q5-Role 4   Q10-Platform 1-Primary  959
## 5 Q5-Role 5   Q10-Platform 1-Primary  430
## 6 Q5-Role 1 Q10-Platform 1-Secondary  644
```

```
ggplot(data = role.data.barchart, aes( x =Roles, y = value, fill = variable ) ) +
  geom_bar( stat = 'identity', position = 'dodge' )+
  scale_x_discrete("")+
  labs(y="Number of users",title="Platform usage patterns in differnt roles",fill="")
```



```
#facet_rep_grid(~ variable,repeat.tick.labels = T)
#ggplot(data=role.data.stacked,aes(x=factor(value),fill=variable))+
#(stat="count")+
#facet_wrap(~ variable,scales = "free_y")+
```

There is a clear pattern across all the roles, whereby users spend most of their time working with platform 1 or 4. We also note, that there is a drop in the number of platform users in roles 3 and 5.

Investigating app type data

Respondents had 7 apps types to choose from.Extracting the appropriate columns we have

```
apps.data <-data[,c(1,10:21,22:28)]
head(apps.data)
```

```
##      ResponseID Q10-Platform 1-Primary Q10-Platform 1-Secondary
## 1 R_aXE7seqJu0LmVFz                0                0
## 2 R_5vVjAI7X7mjFv5r                0                0
## 3 R_06sqswy5R4sV8s1                0                0
## 4 R_2rjuFIvBirJRKnz                0                0
## 5 R_7UM1Gsr1ye3db49                0                0
## 6 R_01cRgkoaxMbaHc1                0                0
##      Q10-Platform 1-Third Q10-Platform 2-Primary Q10-Platform 2-Secondary
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##      Q10-Platform 2-Third Q10-Platform 3-Primary Q10-Platform 3-Secondary
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##      Q10-Platform 3-Third Q10-Platform 4-Primary Q10-Platform 4-Secondary
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##      Q10-Platform 4-Third Q12-app type 1 Q12-app type 2 Q12-app type 3
## 1                0                0                0                0
## 2                0                1                0                0
## 3                0                0                0                1
## 4                0                0                0                1
## 5                0                0                0                0
## 6                0                0                0                0
##      Q12-app type 4 Q12-app type 5 Q12-app type 6 Q12-app type 7
## 1                0                0                0                0
## 2                0                0                0                0
## 3                0                0                0                0
## 4                0                0                0                0
## 5                0                0                0                0
## 6                0                0                0                0
```

Reshaping the data in long format collapsing the different platform columns as shown below

```
apps.data.long <- melt(apps.data,id.vars=colnames(apps.data)[c(1,14:20)])
head(apps.data.long)
```

```
##      ResponseID Q12-app type 1 Q12-app type 2 Q12-app type 3 Q12-app type 4
## 1 R_aXE7seqJu0LmVFz                0                0                0                0
## 2 R_5vVjAI7X7mjFv5r                1                0                0                0
## 3 R_06sqswy5R4sV8s1                0                0                1                0
## 4 R_2rjuFIvBirJRKnz                0                0                1                0
## 5 R_7UM1Gsr1ye3db49                0                0                0                0
## 6 R_01cRgkoaxMbaHc1                0                0                0                0
##      Q12-app type 5 Q12-app type 6 Q12-app type 7      variable value
## 1                0                0                0 Q10-Platform 1-Primary 0
## 2                0                0                0 Q10-Platform 1-Primary 0
## 3                0                0                0 Q10-Platform 1-Primary 0
## 4                0                0                0 Q10-Platform 1-Primary 0
## 5                0                0                0 Q10-Platform 1-Primary 0
## 6                0                0                0 Q10-Platform 1-Primary 0
```

We eliminate rows with 0 entry in the value column above i.e. entries where a platform usage has been selected.

```
apps.data.long.selected.plat <- apps.data.long[role.data.long$value!=0,]
apps.data.long.selected.plat <- melt(apps.data.long.selected.plat,id.vars=c("ResponseID","variable","value"))
colnames(apps.data.long.selected.plat)[2:3]=c("Plat.usage","Plat.selected")
View(apps.data.long.selected.plat)
head(apps.data.long.selected.plat)
```

```
##      ResponseID      Plat.usage Plat.selected      variable value
## 1 R_agj3m9SYCOL2qMd Q10-Platform 1-Primary      1 Q12-app type 1      0
## 2 R_8jqspsl0TZ3ljKt Q10-Platform 1-Primary      1 Q12-app type 1      0
## 3 R_cHJ7TzxGxr7Vsdn Q10-Platform 1-Primary      1 Q12-app type 1      0
## 4 R_b3lfAGBy1K5X0eh Q10-Platform 1-Primary      1 Q12-app type 1      0
## 5 R_0DmpCWzkW2Oc9T Q10-Platform 1-Primary      1 Q12-app type 1      1
## 6 R_b1NBCPgpKdgFZOd Q10-Platform 1-Primary      1 Q12-app type 1      0
```

Now we eliminate apps not selected, so we end up with selected platforms and apps.

```
apps.data.long.selected.all <- apps.data.long.selected.plat[apps.data.long.selected.plat$value!=0,]
View(apps.data.long.selected.all)
apps.data.wide <- dcast(apps.data.long.selected.all, variable~Plat.usage , value.var = 'value', fun.aggregate = sum)
View(apps.data.wide)
```

Expressing the data table in long format ready for plotting

```
apps.data.barchart <- melt(apps.data.wide,id.vars="variable")
View(apps.data.barchart)
```

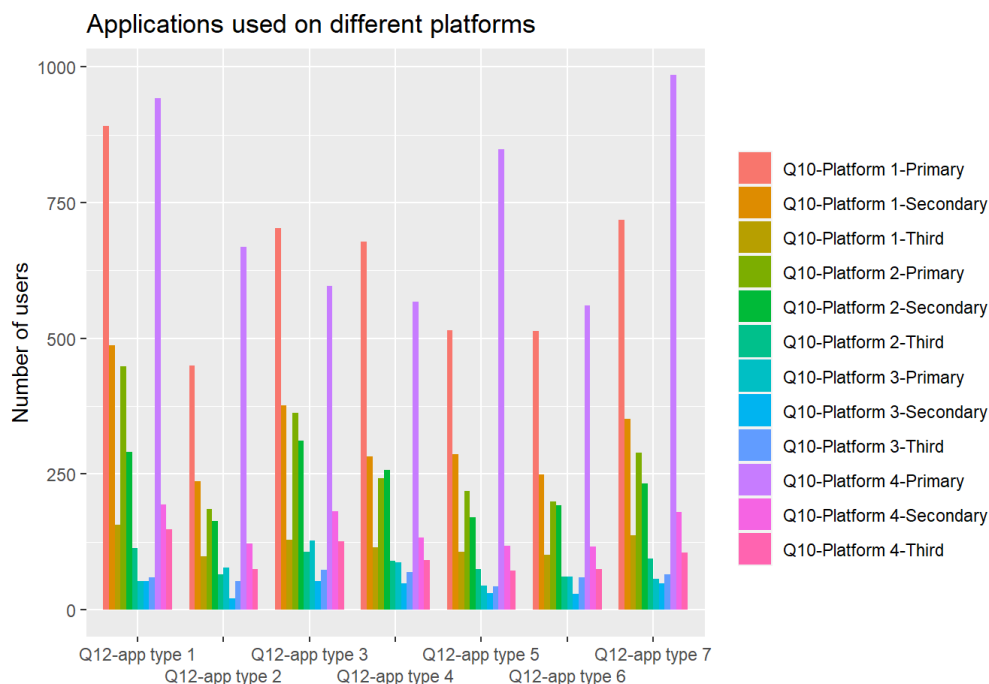
Applying changes to column names and plotting, we have

```
colnames(apps.data.barchart)=c("Apps","variable","value")
head(apps.data.barchart)
```

```
##      Apps      variable value
## 1 Q12-app type 1 Q10-Platform 1-Primary 892
## 2 Q12-app type 2 Q10-Platform 1-Primary 450
## 3 Q12-app type 3 Q10-Platform 1-Primary 703
## 4 Q12-app type 4 Q10-Platform 1-Primary 678
## 5 Q12-app type 5 Q10-Platform 1-Primary 515
## 6 Q12-app type 6 Q10-Platform 1-Primary 513
```

```
ggplot(data = apps.data.barchart, aes( x =Apps, y = value, fill = variable ) ) +
  geom_col( stat = 'identity', width =0.8, position = position_dodge(0.8) )+
  scale_x_discrete("",guide = guide_axis(n.dodge=2))+
  labs(y="Number of users",title="Applications used on different platforms",fill="")
```

```
## Warning: Ignoring unknown parameters: stat
```



```
#facet_rep_grid(~ variable,repeat.tick.labels = T)
#ggplot(data=role.data.stacked,aes(x=factor(value),fill=variable))+
#(stat="count")+
#facet_wrap(~ variable,scales = "free_y")+
```

Again, similar pattern to roles data with users spending most of their time on platform 1 and 4 across all the app types. In particular, these primary users of platform 1 and 4 will most likely choose app type 1 or 7.

Investigating Tools data

Respondents had 6 tool types to choose from. Extracting the appropriate columns we have

```
tools.data <- data[, c(1, 10:21, 29:34)]
head(tools.data)
```

```
##      ResponseID Q10-Platform 1-Primary Q10-Platform 1-Secondary
## 1 R_aXE7seqJu0LmVFz                0                0
## 2 R_5vVjAI7X7mjFv5r                0                0
## 3 R_06sqswy5R4sV8s1                0                0
## 4 R_2rjuFivBirJRKnz                0                0
## 5 R_7UM1Gsr1ye3db49                0                0
## 6 R_01cRgkoaxMbaHc1                0                0
##      Q10-Platform 1-Third Q10-Platform 2-Primary Q10-Platform 2-Secondary
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##      Q10-Platform 2-Third Q10-Platform 3-Primary Q10-Platform 3-Secondary
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##      Q10-Platform 3-Third Q10-Platform 4-Primary Q10-Platform 4-Secondary
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##      Q10-Platform 4-Third Q14-tool type 1 Q14-tool type 2 Q14-tool type 3
## 1                0                0                0                1
## 2                0                1                0                0
## 3                0                0                0                0
## 4                0                0                0                1
## 5                0                0                0                0
## 6                0                0                0                0
##      Q14-tool type 4 Q14-tool type 5 Q14-tool type 6
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
```

Reshaping the data in long format collapsing the different platform columns as shown below

```
tools.data.long <- melt(tools.data, id.vars = colnames(tools.data)[c(1, 14:19)])
head(tools.data.long)
```

```
##      ResponseID Q14-tool type 1 Q14-tool type 2 Q14-tool type 3
## 1 R_aXE7seqJu0LmVFz                0                0                1
## 2 R_5vVjAI7X7mjFv5r                1                0                0
## 3 R_06sqswy5R4sV8s1                0                0                0
## 4 R_2rjuFivBirJRKnz                0                0                1
## 5 R_7UM1Gsr1ye3db49                0                0                0
## 6 R_01cRgkoaxMbaHc1                0                0                0
##      Q14-tool type 4 Q14-tool type 5 Q14-tool type 6      variable value
## 1                0                0                0 Q10-Platform 1-Primary 0
## 2                0                0                0 Q10-Platform 1-Primary 0
## 3                0                0                0 Q10-Platform 1-Primary 0
## 4                0                0                0 Q10-Platform 1-Primary 0
## 5                0                0                0 Q10-Platform 1-Primary 0
## 6                0                0                0 Q10-Platform 1-Primary 0
```

We eliminate rows with 0 entry in the value column above i.e. entries where a platform usage has been selected.

```
tools.data.long.selected.plat <- tools.data.long[tools.data.long$value!=0,]
tools.data.long.selected.plat <- melt(tools.data.long.selected.plat,id.vars=c("ResponseID","variable","value"))
colnames(tools.data.long.selected.plat)[2:3]=c("Plat.usage","Plat.selected")
View(tools.data.long.selected.plat)
head(tools.data.long.selected.plat)
```

```
##           ResponseID           Plat.usage Plat.selected      variable value
## 1 R_agj3m9SYCOL2qMd Q10-Platform 1-Primary          1 Q14-tool type 1      0
## 2 R_8jqspsl0TZ3ljKt Q10-Platform 1-Primary          1 Q14-tool type 1      0
## 3 R_cHJ7TzxGxr7Vsdn Q10-Platform 1-Primary          1 Q14-tool type 1      0
## 4 R_b3lfAGBy1K5XOeh Q10-Platform 1-Primary          1 Q14-tool type 1      1
## 5 R_0DmpCWZkKw2Ooc9T Q10-Platform 1-Primary          1 Q14-tool type 1      0
## 6 R_b1NBCPgPKdgFZ0d Q10-Platform 1-Primary          1 Q14-tool type 1      0
```

Now we eliminate tools not selected, so we end up with selected platforms and tools.

```
tools.data.long.selected.all <- tools.data.long.selected.plat[tools.data.long.selected.plat$value!=0,]
View(tools.data.long.selected.all)
tools.data.wide <- dcast(tools.data.long.selected.all, variable~Plat.usage , value.var = 'value', fun.aggregate = sum)
View(tools.data.wide)
```

Express data table in long format ready for plotting

```
tools.data.barchart <- melt(tools.data.wide,id.vars="variable")
View(tools.data.barchart)
```

Applying changes to column names and plotting, we have

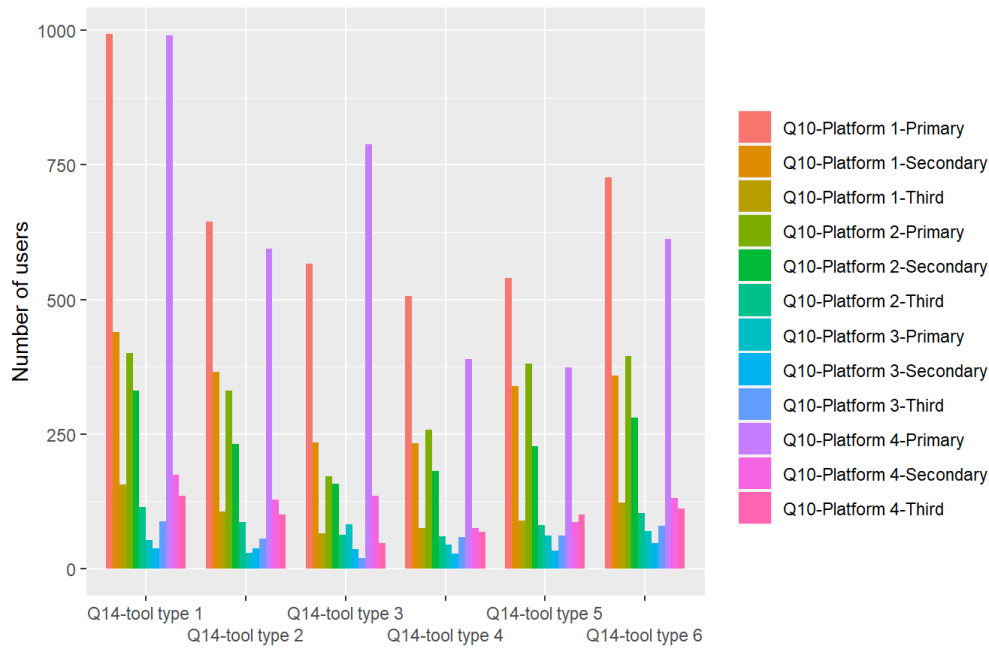
```
colnames(tools.data.barchart)=c("Tools","variable","value")
head(tools.data.barchart)
```

```
##           Tools           variable value
## 1 Q14-tool type 1 Q10-Platform 1-Primary  993
## 2 Q14-tool type 2 Q10-Platform 1-Primary  645
## 3 Q14-tool type 3 Q10-Platform 1-Primary  567
## 4 Q14-tool type 4 Q10-Platform 1-Primary  506
## 5 Q14-tool type 5 Q10-Platform 1-Primary  540
## 6 Q14-tool type 6 Q10-Platform 1-Primary  727
```

```
ggplot(data = tools.data.barchart, aes( x =Tools, y = value, fill = variable ) ) +
  geom_col( stat = 'identity', width =0.8, position = position_dodge(0.8) )+
  scale_x_discrete("",guide = guide_axis(n.dodge=2))+
  labs(y="Number of users",title="Tools used on different platforms",fill="")
```

```
## Warning: Ignoring unknown parameters: stat
```

Tools used on different platforms



```
#facet_rep_grid(~ variable,repeat.tick.labels = T)
#ggplot(data=role.data.stacked,aes(x=factor(value),fill=variable))+
#(stat="count")+
#facet_wrap(~ variable,scales = "free_y")+
```

This recurring pattern of users spending most of their time on platform 1 and 4 across different categories continue. However, in this case these primary users of platform 1 and 4 will most likely choose tool type 1.

Investigating Language data

Respondents had 12 language options to choose from. Extracting the appropriate columns we have

```
language.data <- data[,c(1,10:21,35:46)]
head(language.data)
```


##	ResponseID	Q10-Platform 1-Primary	Q10-Platform 1-Secondary
## 1	R_aXE7seqJu0LmVFz	0	0
## 2	R_5vVjAI7X7mjFv5r	0	0
## 3	R_06sqswy5R4sV8s1	0	0
## 4	R_2rjuFivBirJRKnz	0	0
## 5	R_7UM1Gsr1ye3db49	0	0
## 6	R_01cRgkoaxMbaHc1	0	0
##	Q10-Platform 1-Third	Q10-Platform 2-Primary	Q10-Platform 2-Secondary
## 1	0	0	0
## 2	0	0	0
## 3	0	0	0
## 4	0	0	0
## 5	0	0	0
## 6	0	0	0
##	Q10-Platform 2-Third	Q10-Platform 3-Primary	Q10-Platform 3-Secondary
## 1	0	0	0
## 2	0	0	0
## 3	0	0	0
## 4	0	0	0
## 5	0	0	0
## 6	0	0	0
##	Q10-Platform 3-Third	Q10-Platform 4-Primary	Q10-Platform 4-Secondary
## 1	0	0	0
## 2	0	0	0
## 3	0	0	0
## 4	0	0	0
## 5	0	0	0
## 6	0	0	0
##	Q10-Platform 4-Third	Q15-Language 1-Primary	Q15-Language 1-Also using
## 1	0	1	0
## 2	0	0	0
## 3	0	0	0
## 4	0	0	0
## 5	0	1	0
## 6	0	0	0
##	Q15-Language 2-Primary	Q15-Language 2-Also using	Q15-Language 3-Primary
## 1	0	0	0
## 2	0	0	1
## 3	0	0	0
## 4	0	0	0
## 5	0	0	0
## 6	0	0	0
##	Q15-Language 3-Also using	Q15-Language 4-Primary	Q15-Language 4-Also using
## 1	0	0	0
## 2	0	0	0
## 3	0	0	0
## 4	1	0	1
## 5	0	0	0
## 6	0	0	0
##	Q15-Language 5-Primary	Q15-Language 5-Also using	Q15-Language 6-Primary
## 1	0	0	0
## 2	0	0	0
## 3	0	0	0
## 4	0	0	0
## 5	0	0	0
## 6	0	0	0
##	Q15-Language 6-Also using		
## 1	0		
## 2	0		
## 3	0		
## 4	0		
## 5	0		
## 6	0		

Reshaping the data in long format collapsing the different platform columns as shown below

```
language.data.long <- melt(language.data,id.vars=colnames(language.data)[c(1,14:25)])
head(language.data.long)
```

```
##      ResponseID Q15-Language 1-Primary Q15-Language 1-Also using
## 1 R_aXE7seqJu0LmVFz                1                0
## 2 R_5vVjAI7X7mjFv5r                0                0
## 3 R_06sqswy5R4sV8s1                0                0
## 4 R_2rjuFIvBirJRKnz                0                0
## 5 R_7UM1Gsr1ye3db49                1                0
## 6 R_01cRgkoaxMbaHc1                0                0
##      Q15-Language 2-Primary Q15-Language 2-Also using Q15-Language 3-Primary
## 1                0                0                0
## 2                0                0                1
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##      Q15-Language 3-Also using Q15-Language 4-Primary Q15-Language 4-Also using
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                1                0                1
## 5                0                0                0
## 6                0                0                0
##      Q15-Language 5-Primary Q15-Language 5-Also using Q15-Language 6-Primary
## 1                0                0                0
## 2                0                0                0
## 3                0                0                0
## 4                0                0                0
## 5                0                0                0
## 6                0                0                0
##      Q15-Language 6-Also using      variable value
## 1                0 Q10-Platform 1-Primary      0
## 2                0 Q10-Platform 1-Primary      0
## 3                0 Q10-Platform 1-Primary      0
## 4                0 Q10-Platform 1-Primary      0
## 5                0 Q10-Platform 1-Primary      0
## 6                0 Q10-Platform 1-Primary      0
```

We eliminate rows with 0 entry in the value column above i.e. entries where a platform usage has been selected.

```
language.data.long.selected.plat <- language.data.long[role.data.long$value!=0,]
language.data.long.selected.plat <- melt(language.data.long.selected.plat,id.vars=c("ResponseID","variable","value"))
colnames(language.data.long.selected.plat)[2:3]=c("Plat.usage","Plat.selected")
View(language.data.long.selected.plat)
head(language.data.long.selected.plat)
```

```
##      ResponseID      Plat.usage Plat.selected      variable
## 1 R_agj3m9SYCOL2qMd Q10-Platform 1-Primary      1 Q15-Language 1-Primary
## 2 R_8jqspsl0TZ3ljKt Q10-Platform 1-Primary      1 Q15-Language 1-Primary
## 3 R_cHJ7TzxGxr7Vsdn Q10-Platform 1-Primary      1 Q15-Language 1-Primary
## 4 R_b3lfAGBy1K5X0eh Q10-Platform 1-Primary      1 Q15-Language 1-Primary
## 5 R_0DmpCWZkKw20oc9T Q10-Platform 1-Primary      1 Q15-Language 1-Primary
## 6 R_b1NBCPgpKdgFZ0d Q10-Platform 1-Primary      1 Q15-Language 1-Primary
##      value
## 1      0
## 2      0
## 3      0
## 4      1
## 5      0
## 6      1
```

Now we eliminate language options not selected, so we end up with selected platforms and language options.

```
language.data.long.selected.all <- language.data.long.selected.plat[language.data.long.selected.plat$value!=0,]
View(language.data.long.selected.all)
language.data.wide <- dcast(language.data.long.selected.all, variable~Plat.usage , value.var = 'value', fun.aggregate = sum)
View(language.data.wide)
```

Express data table in long format ready for plotting

```
language.data.barchart <- melt(language.data.wide,id.vars="variable")
View(language.data.barchart)
```

Applying changes to column names and plotting, we have

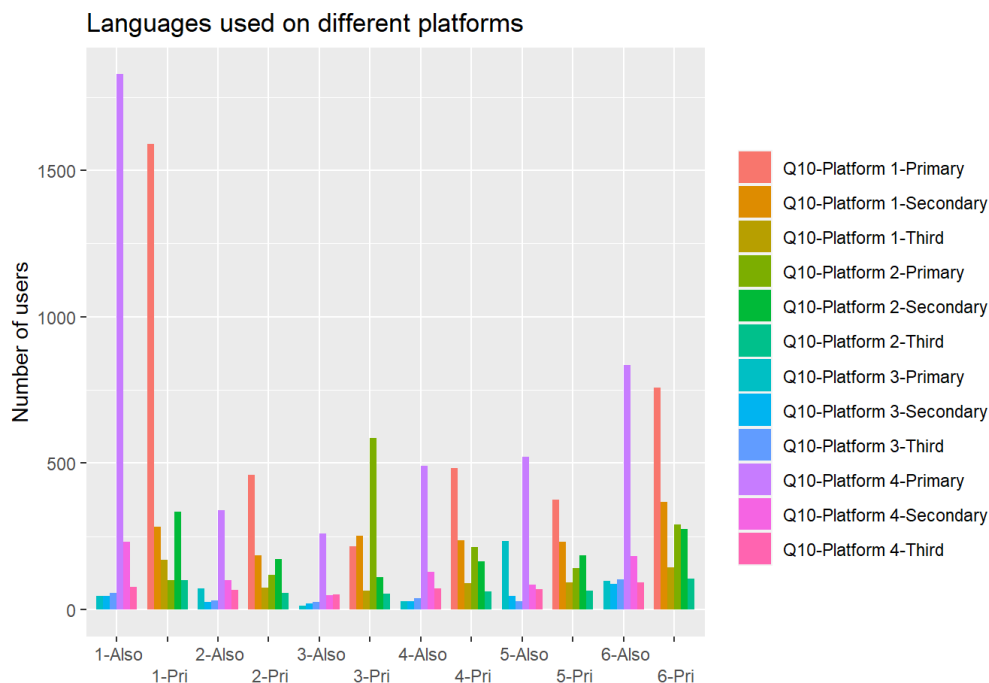
```
colnames(language.data.barchart)=c("Language","variable","value")
head(language.data.barchart)
```

```
##           Language          variable value
## 1  Q15-Language 1-Primary Q10-Platform 1-Primary 1590
## 2  Q15-Language 1-Also using Q10-Platform 1-Primary 460
## 3  Q15-Language 2-Primary Q10-Platform 1-Primary 11
## 4  Q15-Language 2-Also using Q10-Platform 1-Primary 110
## 5  Q15-Language 3-Primary Q10-Platform 1-Primary 375
## 6  Q15-Language 3-Also using Q10-Platform 1-Primary 758
```

```
language.data.barchart$Language <- c(str_sub(language.data.barchart$Language[c(T,F)],13,-5),str_sub(language.data.barchart$Language[c(F,T)],13,-7))
```

```
ggplot(data =language.data.barchart, aes( x =Language, y = value, fill = variable ) ) +
  geom_col( stat = 'identity', width =0.8, position = position_dodge(0.8) )+
  scale_x_discrete("",guide = guide_axis(n.dodge=2))+
  labs(y="Number of users",title="Languages used on different platforms",fill="")
```

```
## Warning: Ignoring unknown parameters: stat
```



```
##ggplot(data =language.data.barchart, aes( x =Language, y = value,fill=variable)) +
  #geom_col(stat = 'identity')+
  #facet_wrap(~ variable)+
  #theme(axis.text.x = element_text(margin = unit(c(0, 0, 0, 0), "mm"), angle = 90))
  #labs(title="Platform usage by different applications",fill="")
  #facet_rep_grid(~ variable,repeat.tick.labels = T)
##ggplot(data=role.data.stacked,aes(x=factor(value),fill=variable))+
  #(stat="count")+
  #facet_wrap(~ variable,scales = "free_y")+
```

Here, we stop seeing the pattern witnessed in the previous sections. Only one platform ,not two, dominates the number of user in each category. Also, for one category, most users working primarily with language 3 spent most of their time on platform 2 (unlike before where platform 1 and 4 dominated every category).Most notable features for languages, is the high number of users working with language 1. Either, as the main language or secondary language in development.