FacultyTenure

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```
data<-read_excel("/Users/linlizhou/Documents/LASELL/Faculty Data for Analyst Candidates.xlsx")
```

```
theme_lz <- function(){
    font <- "Helvetica"   #assign font family up front
    theme_minimal() %+replace%    #replace elements already strips axis lines,
    theme(
      panel.grid.major = element_blank(),    #strip major gridlines
      panel.grid.minor = element_blank(),    #strip minor gridlines
      plot.title = element_text(family = font, size = 9, face = 'bold',hjust = 0.5, vjust = 2),
      axis.title = element_text(family = font, size = 9),
      axis.text = element_text(family = font, size = 9),
      axis.text.x = element_text(family = font, size = 9, margin = margin(t=5,b=10)),
      axis.ticks = element_blank(),          #strip axis ticks
      axis.text.y=element_blank(),
      legend.title = element_text(family = font, size=9),
      legend.text = element_text(family = font, size=7),
      legend.position="bottom",
      legend.direction = "horizontal",

      strip.text = element_text(family = font, size = 9, margin = margin(t=5,b=10)),#move up is + 1
      strip.background = element_blank()
    )}
mycolors<-c("#13294b","#5c88da","#69b3e7","#da291c","#641F45","#fcb53b","#6C6F70")#1-3blue,4-5red,6yell
```

Research questions

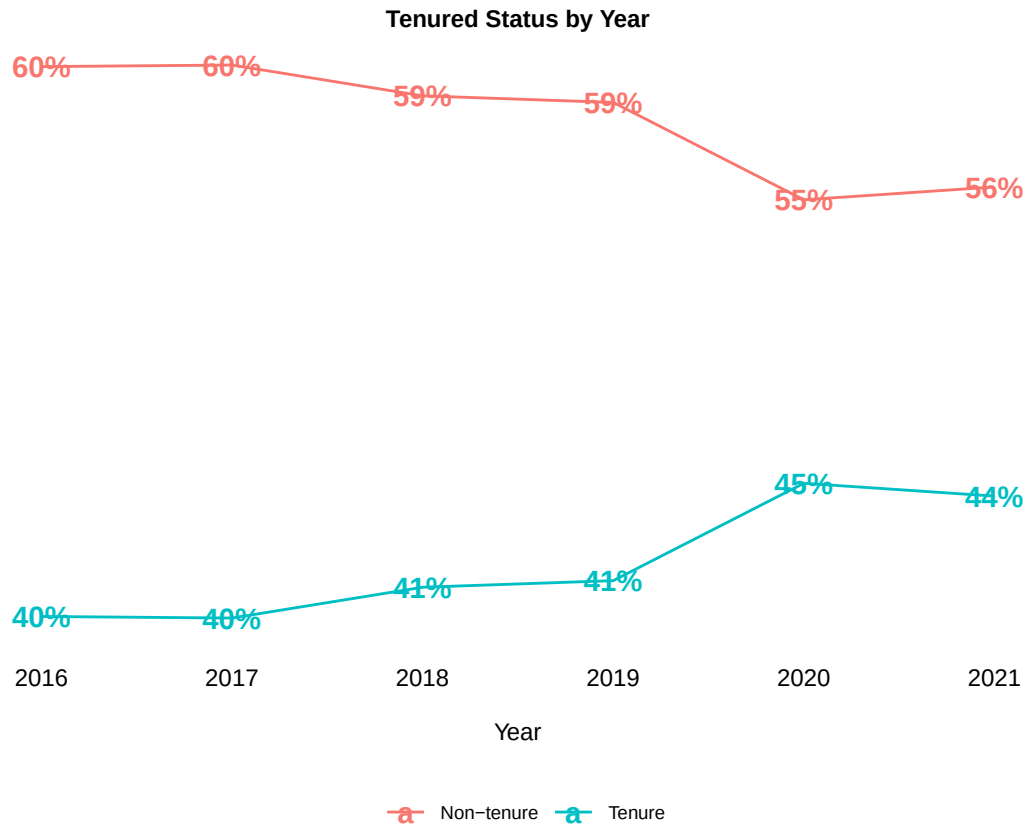
- Who/what job titles are those tenured/non tenured
- Prt of each job title that tenured = tenured in job1/ all people in job1
- T/NT prt (out of all T/NT total in each year) by year
- T/NT prt (out of all T/NT total in each department) by department
- Gender equity: female tenured/ all female vs male
- Gender equity by department: in department 1, calcualte male-female prt gap, then rank
- Racial equity: tenured in race1/ all people in race1
- Gender equity by department: in department 1, calcualte white-black prt gap, then rank

```
#remove duplicated rows
data<-unique(data)#from 4003 to 3984 observations
#remove duplicated ID/persons
unique(data$ID)%>%length()#1147 unique ID
data%>% group_by(ID) %>% summarise(cnt=n()) %>%arrange(-cnt) %>%filter(cnt>1) #815 duplicated IDs
```

Yearly Tenure Status

Tenured percentage has been increased since 2016 from 40% to 44% in 2021, with 2020 being the highest 45%. Non-tenured faculty percentage has been decreased from 60% to 56%, with 2020 being the lowest 55%. There are still 12% less tenured faculty than non tenured.

```
data%>%group_by(Year, `Tenure Status`)%>%
  summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/sum(cnt),digits=0))%>%
  ggplot(aes(color=factor(`Tenure Status`),x=factor(Year),y=prt,group=factor(`Tenure Status`)))+geom_li
  geom_text(aes(label=prt),fontface="bold")+
  theme_lz()+
  scale_y_continuous(breaks = seq(.4,.6,by=.05),labels = scales::percent)+
  labs(title="Tenured Status by Year",x="Year",y="")+
   scale_color_discrete(labels=c("Non-tenure","Tenure"),name="")+
  theme(axis.text.y=element_blank())
```

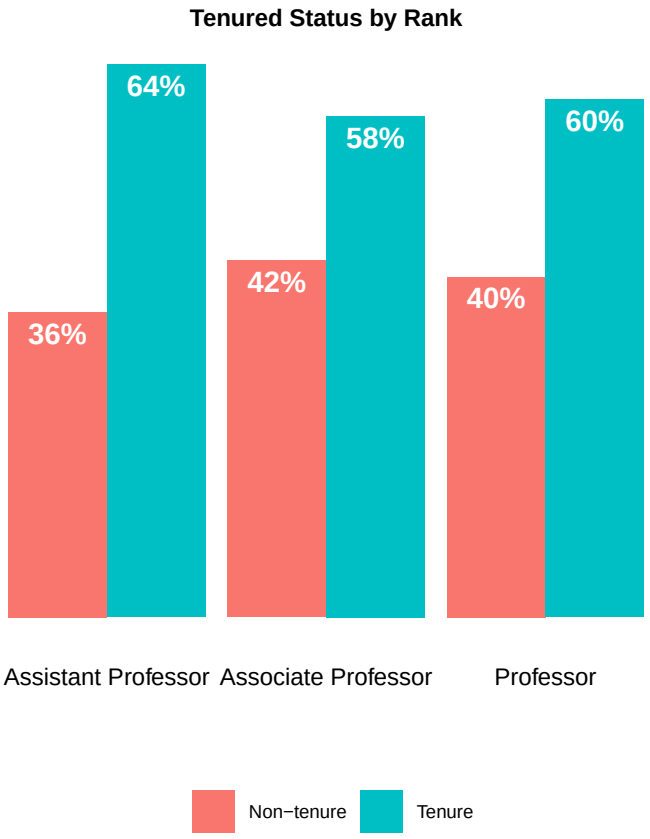



```
#scale_color_discrete(values = c("Non-tenure"=mycolors[4],"Tenure"=mycolors[1]),name="")
#geom_bar(stat = "identity", position=position_dodge())
```

Tenure Status by Rank, Race, and Sex

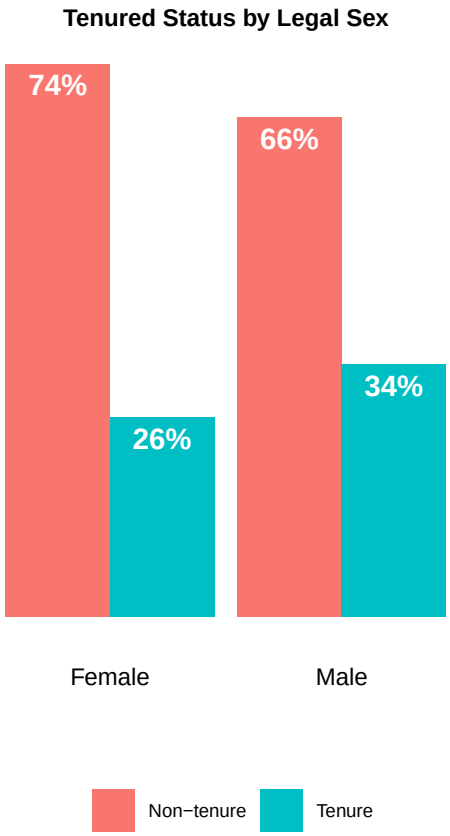
Assistant Professor has 64% Tenured status, 4% higher than Professor and 6% higher than Associate Professor.

```
data%>% filter(Rank=="Professor"|Rank=="Assistant Professor"| Rank=="Associate Professor")%>%
  group_by(Rank,`Tenure Status`)%>%summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/sum(cnt),digi
ggplot(aes(fill=factor(`Tenure Status`),x=factor(Rank),y=prt))+
  geom_bar(stat = "identity",position = position_dodge())+
  geom_text(aes(label=prt),position=position_dodge(.9),vjust=1.5,color="white",fontface="bold")+theme_l
  scale_fill_discrete(labels=c("Non-tenure","Tenure"),name="")+
  labs(x="",y="",title="Tenured Status by Rank")
```



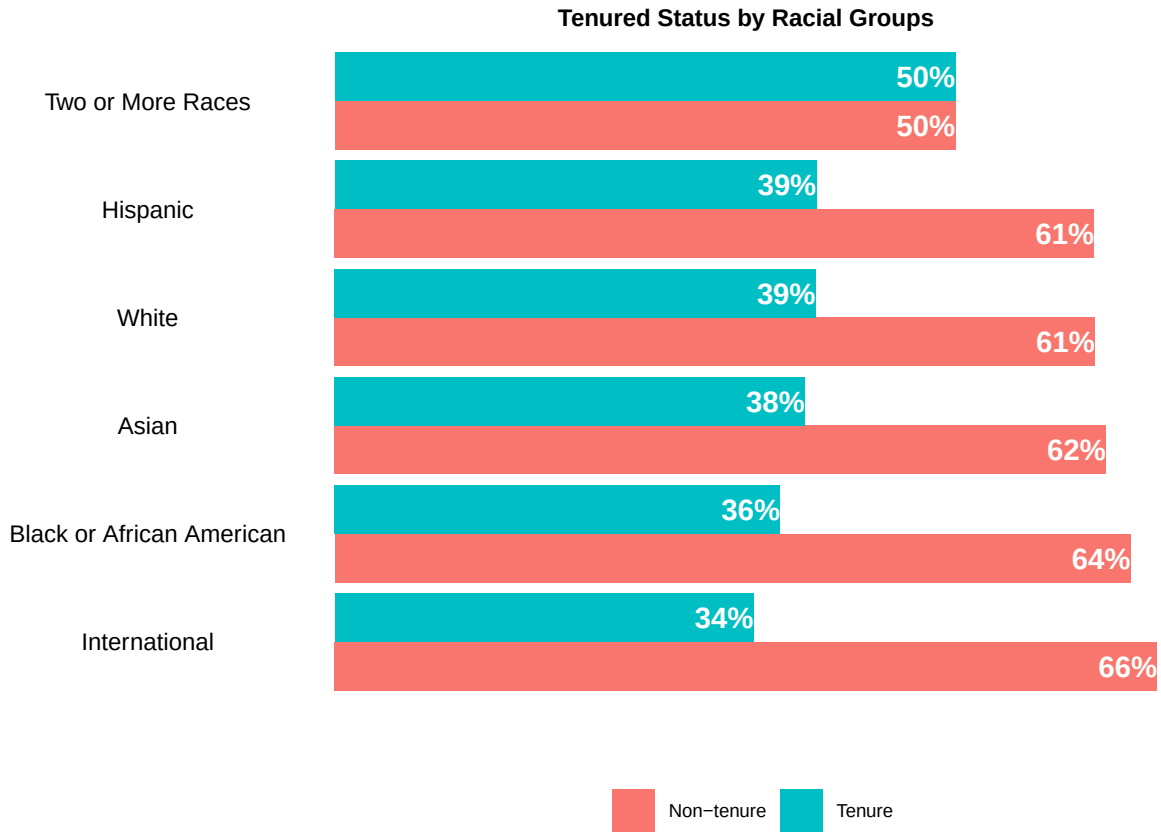
Male faculty has 8% more tenured rate than female faculty.

```
data%>%  filter(`Legal Sex`!="Unreported") %>% group_by(`Legal Sex`,`Tenure Status`)%>% summarise(cnt=n
ggplot(aes(fill=factor(`Tenure Status`),x=factor(`Legal Sex`),y=prt))+
  geom_bar(stat = "identity",position = position_dodge())+
  geom_text(aes(label=prt),position=position_dodge(.9),vjust=1.5,color="white",fontface="bold")+theme_l
  scale_fill_discrete(labels=c("Non-tenure","Tenure"),name="")+
  labs(x="",y="",title="Tenured Status by Legal Sex")
```



Faculty from two or more races has the highest tenured rate, 50%. Hispanic and White faculty have 39% tenured rate. Asian has 38%, African American has 36%, and International has the lowest 34% tenured rate.

```
#set order
race.order<-data%>%filter(`Race/Ethnicity`!=c ("Unreported",NA) )%>%
  group_by(`Race/Ethnicity`,`Tenure Status`)%>%summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/su

data%>%filter(`Race/Ethnicity`!=c ("Unreported",NA) )%>%
  group_by(`Race/Ethnicity`,`Tenure Status`)%>%summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/su
ggplot(aes(fill=factor(`Tenure Status`),y=factor(`Race/Ethnicity`),x=prt))+
  geom_bar(stat = "identity",position = position_dodge())+
  geom_text(aes(label=prt),position=position_dodge(.9),hjust=1,color="white",fontface="bold")+theme_lz()
  scale_fill_discrete(labels=c("Non-tenure","Tenure"),name="")+
  labs(x="",y="",title="Tenured Status by Racial Groups")+
  scale_y_discrete(limits=race.order$race.f)+
  theme(axis.text.x = element_blank(),axis.text.y = element_text(size=9))
```

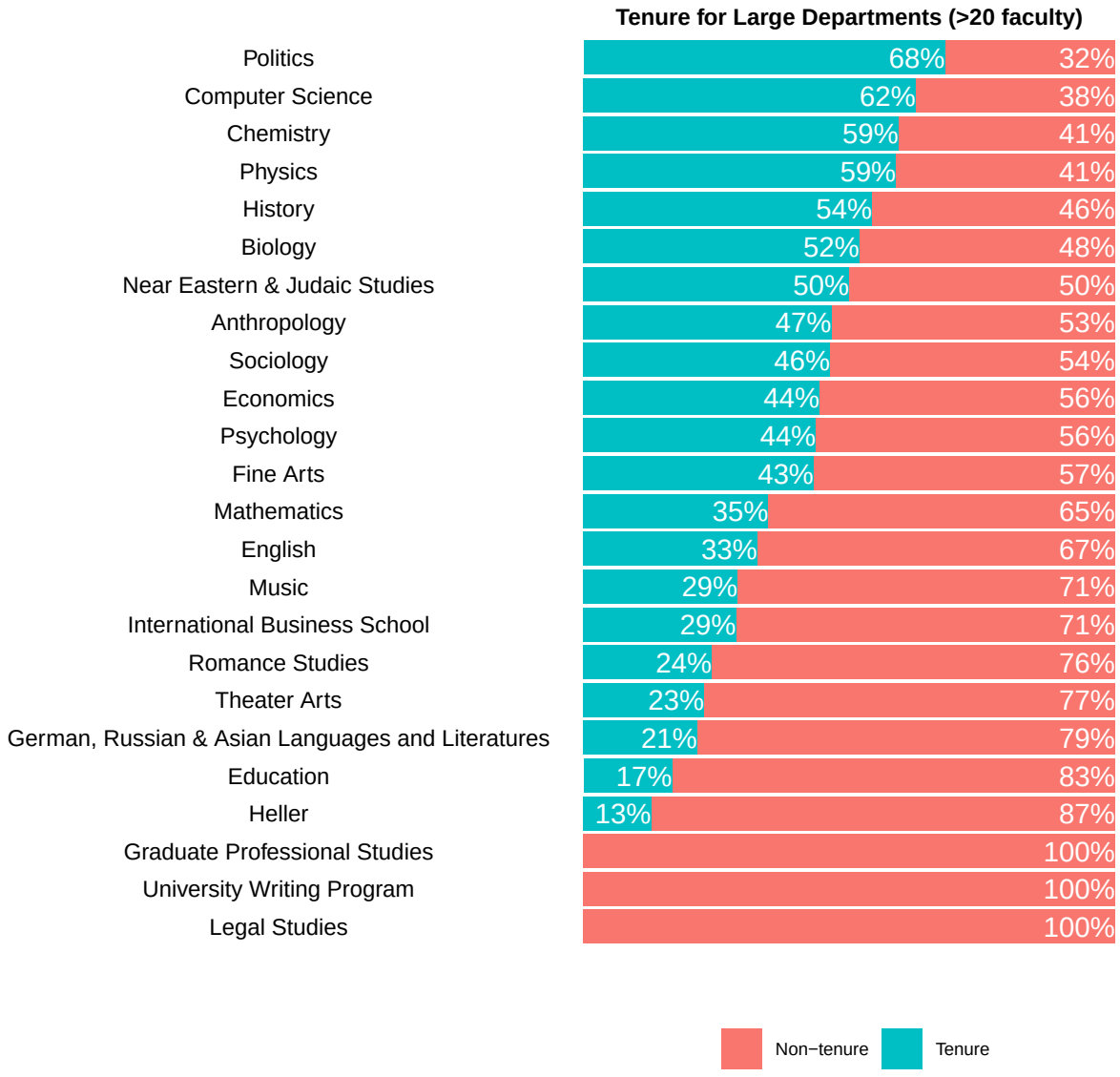


Departmental Tenure Status

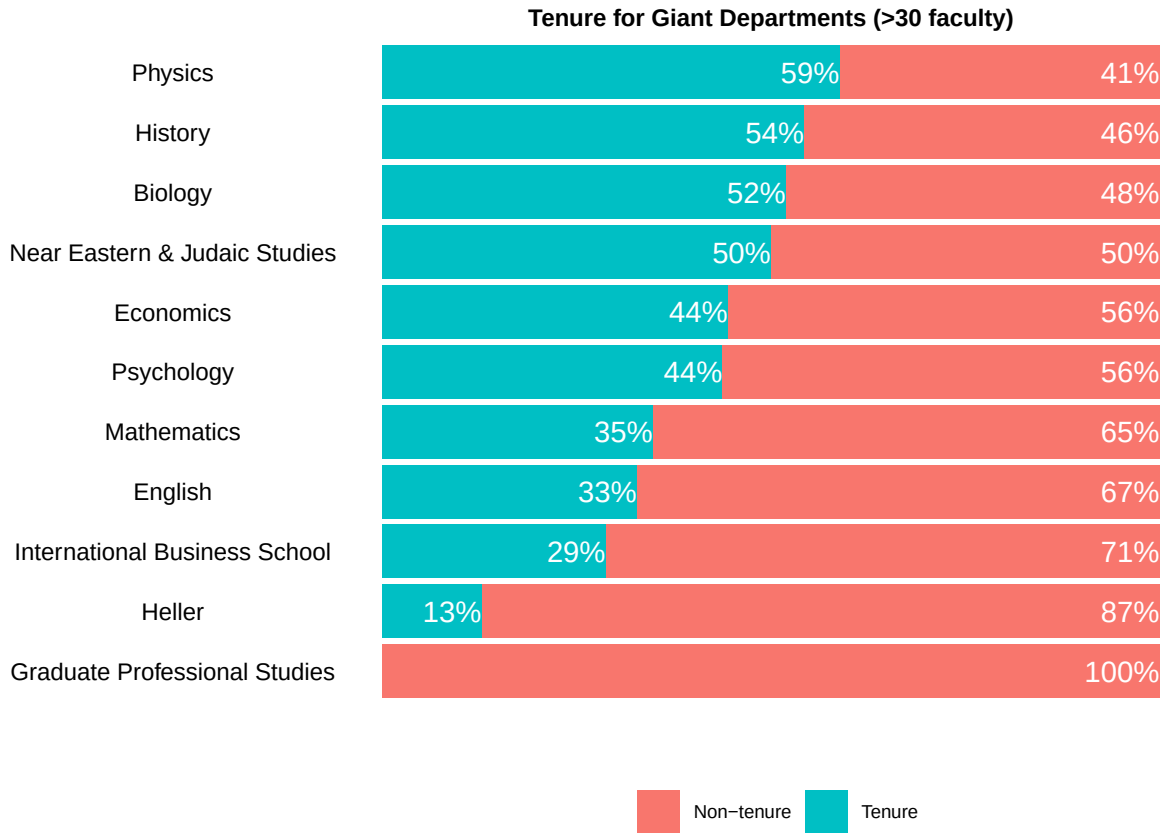
```
#make department count as ndep
ndep<-data%>%group_by(Department)%>%summarise(cnt=n_distinct(ID))%>%arrange(-cnt)#
#four groups based on department count
ndep[ndep$cnt>30,]%>%str() #11 giant departments
ndep[ndep$cnt%in%seq(21,30,by=1),]%>%str() #13 large departments
ndep[ndep$cnt%in%seq(5,20,by=1),]%>%str()#14 medium departments
ndep[ndep$cnt<5,]%>%str()#14 small departments

ndep[ndep$cnt>20,]%>%str() #24 large departments

ndep[ndep$cnt>30,]%>%str() #11 giant departments
ndep[ndep$cnt%in%seq(21,30,by=1),]%>%str() #13 large departments
ndep[ndep$cnt%in%seq(5,20,by=1),]%>%str()#14 medium departments
ndep[ndep$cnt<5,]%>%str()#14 small departments

#order based on tenure prt -- exclude those without any tenure
dep.order.t<-data%>%group_by(Department,`Tenure Status`)%>%
  summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/sum(cnt),digits = 0))%>%
  filter(`Tenure Status`=="Tenure Line")%>%arrange(prt)%>%
  mutate(dep.f=factor(Department))

#excluded in order
```

```
order.exclude<-data[( data$Department %in% dep.order.t$dep.f ) == FALSE,] %>%group_by(Department)%>%
  summarise(cnt=n_distinct(ID)) %>% arrange(cnt) %>% mutate(dep.xf=factor(Department))

dep.order<-c(order.exclude$dep.xf,dep.order.t$dep.f)
```

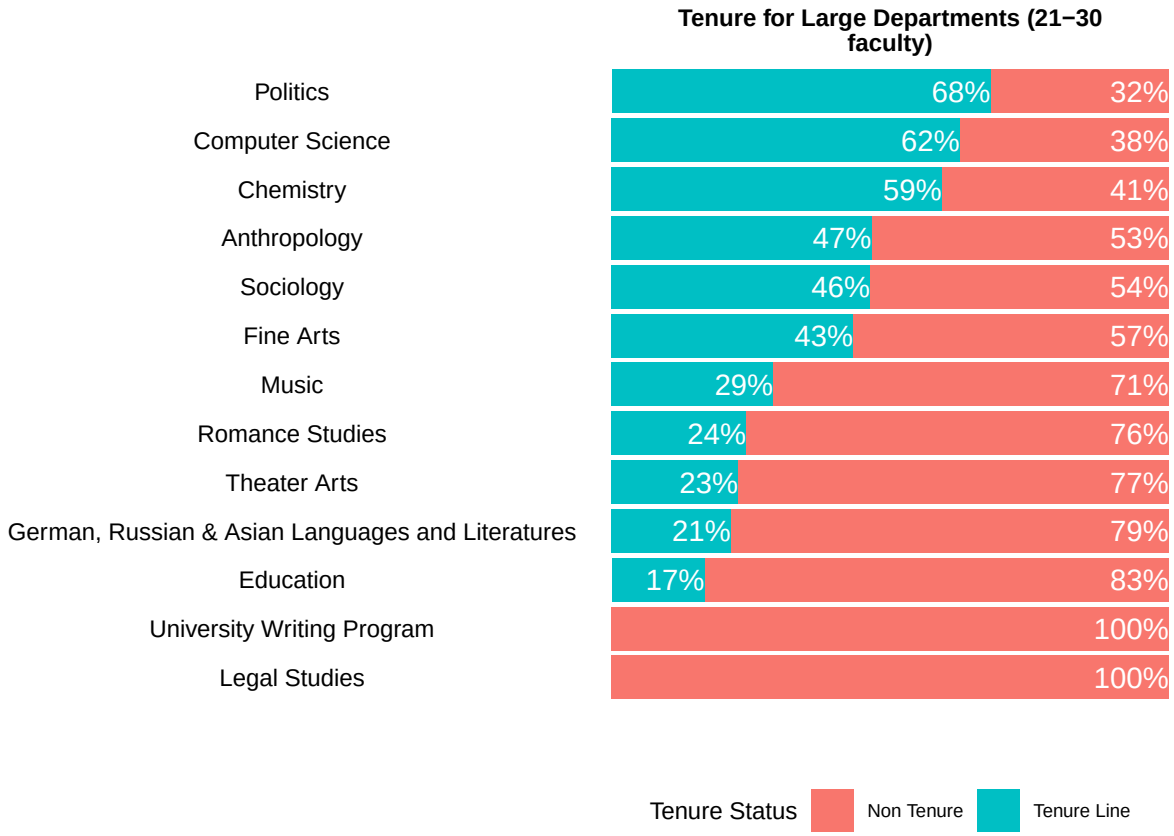
```
#first group n>20, 24 large departments
data%>%filter(Department %in% ndep[ndep$cnt>20,1]$Department ) %>%
  group_by(Department,`Tenure Status`)%>%
  summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/sum(cnt),digits = 0))%>%
  ggplot(aes(x=Department,y=prt,fill=`Tenure Status`))+geom_bar(stat = "identity")+
  scale_x_discrete(limits = dep.order[(dep.order %in% ndep[ndep$cnt>20,1]$Department)==TRUE])+
  theme_lz()+geom_text(aes(label=prt),position = position_stack(),hjust=1,color="white")+
  coord_flip()+theme(axis.text.x = element_blank())+
  theme(axis.text.y=element_text(size = 9))+
  scale_fill_discrete(labels=c("Non-tenure","Tenure"),name="")+
  labs(x="",y="", title="Tenure for Large Departments (>20 faculty)")
```



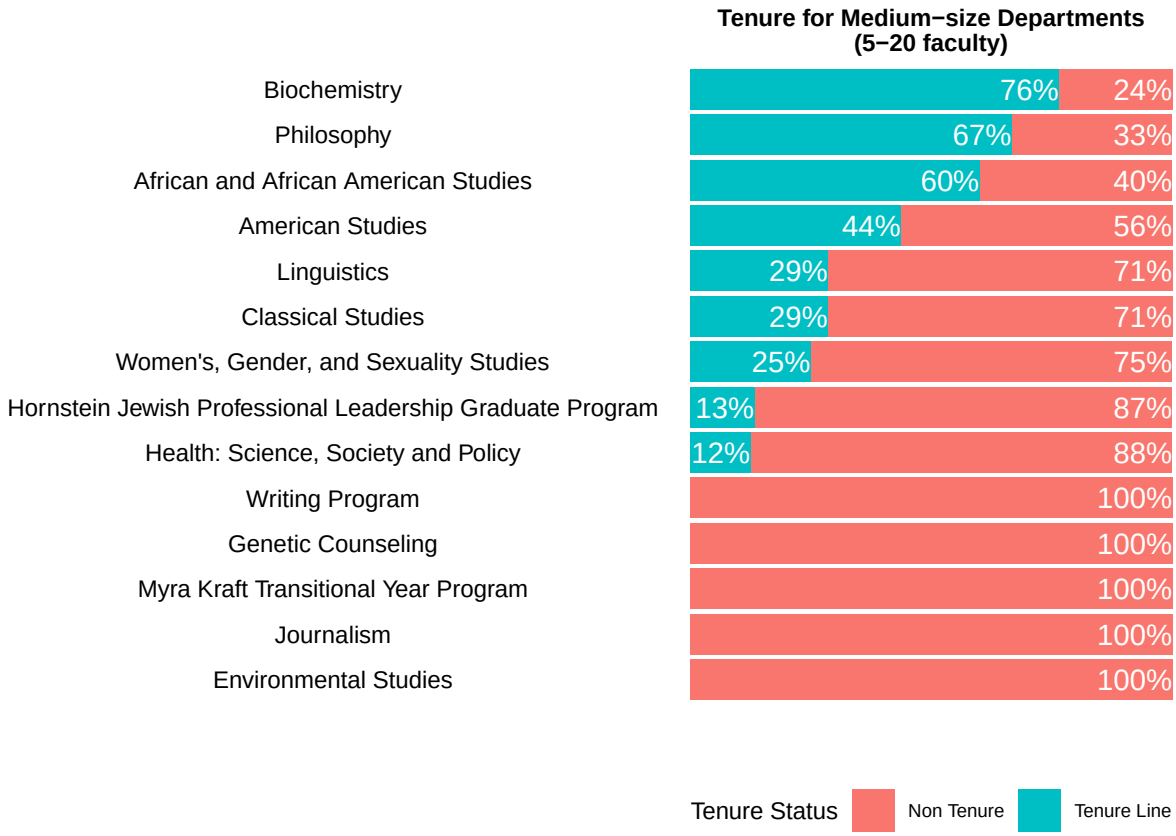
```
#first group n>30, 11 giant departments
data%>%filter(Department %in% ndep[ndep$cnt>30,1]$Department ) %>%
  group_by(Department,`Tenure Status`)%>%
  summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/sum(cnt),digits = 0))%>%
  ggplot(aes(x=Department,y=prt,fill=`Tenure Status`))+geom_bar(stat = "identity")+
  scale_x_discrete(limits = dep.order[(dep.order %in% ndep[ndep$cnt>30,1]$Department)==TRUE])+
  theme_lz()+geom_text(aes(label=prt),position = position_stack(),hjust=1,color="white")+
  coord_flip()+theme(axis.text.x = element_blank())+
  theme(axis.text.y=element_text(size = 9))+
  scale_fill_discrete(labels=c("Non-tenure","Tenure"),name="")+
  labs(x="",y="", title="Tenure for Giant Departments (>30 faculty)")
```



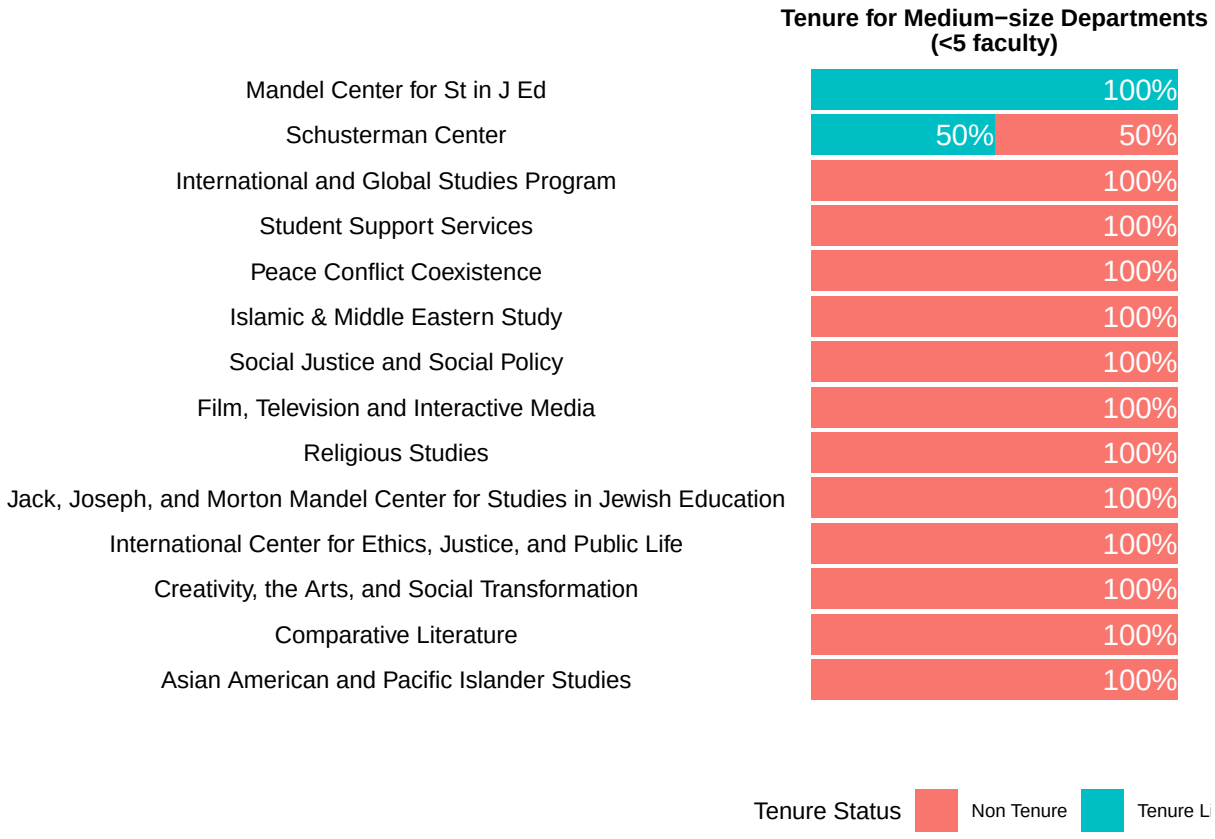

```
#13 large departments
data%>%filter(Department %in% ndep[ndep$cnt%in%seq(21,30,by=1),1]$Department ) %>%
  group_by(Department,`Tenure Status`)%>%
  summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/sum(cnt),digits = 0))%>%
  ggplot(aes(x=Department,y=prt,fill=`Tenure Status`))+geom_bar(stat = "identity")+
  scale_x_discrete(limits = dep.order[dep.order %in%
                                        ndep[ndep$cnt%in%seq(21,30,by=1),1]$Department
                                      ])+
  theme_lz()+geom_text(aes(label=prt),position = position_stack(),hjust=1, color="white")+
  coord_flip()+theme(axis.text.x = element_blank())+
  theme(axis.text.y=element_text(size = 9))+
  labs(x="",y="",title=str_wrap("Tenure for Large Departments (21-30 faculty)",35))
```




```
#22 medium departments
data%>%filter(Department %in% ndep[ndep$cnt%in%seq(5,20,by=1),1]$Department ) %>%
  group_by(Department,`Tenure Status`)%>%
  summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/sum(cnt),digits = 0))%>%
  ggplot(aes(x=Department,y=prt,fill=`Tenure Status`))+geom_bar(stat = "identity")+
  scale_x_discrete(limits = dep.order[dep.order %in%
                                        ndep[ndep$cnt%in%seq(5,20,by=1),1]$Department
                                      ])+
  theme_lz()+geom_text(aes(label=prt),position = position_stack(),hjust=1, color="white")+
  coord_flip()+theme(axis.text.x = element_blank())+
  theme(axis.text.y=element_text(size = 9))+
  labs(x="",y="",title=str_wrap("Tenure for Medium-size Departments (5-20 faculty)",35))
```




```
#14 medium departments
data%>%filter(Department %in% ndep[ndep$cnt<5,1]$Department ) %>%
  group_by(Department,`Tenure Status`)%>%
  summarise(cnt=n_distinct(ID))%>%mutate(prt=percent(cnt/sum(cnt),digits = 0))%>%
  ggplot(aes(x=Department,y=prt,fill=`Tenure Status`))+geom_bar(stat = "identity")+
  scale_x_discrete(limits = dep.order[dep.order %in%
                                        ndep[ndep$cnt<5,1]$Department
                                      ])+
  theme_lz()+geom_text(aes(label=prt),position = position_stack(),hjust=1, color="white")+
  coord_flip()+theme(axis.text.x = element_blank())+
  theme(axis.text.y=element_text(size = 9))+
  labs(x="",y="",title=str_wrap("Tenure for Medium-size Departments (<5 faculty)",35))
```


Tenure for Medium−size Departments
(<5 faculty)
Mandel Center for St in J Ed
100%
Schusterman Center
50%
50%
International and Global Studies Program
100%
Student Support Services
100%
Peace Conflict Coexistence
100%
Islamic & Middle Eastern Study
100%
Social Justice and Social Policy
100%
Film, Television and Interactive Media
100%
Religious Studies
100%
Jack, Joseph, and Morton Mandel Center for Studies in Jewish Education
100%
International Center for Ethics, Justice, and Public Life
100%
Creativity, the Arts, and Social Transformation
100%
Comparative Literature
100%
Asian American and Pacific Islander Studies
100%
Tenure Status
Non Tenure
Tenure Li