1. **How many words are there that contain at least three as and don’t have a 's ending?**

The command I have written for this purpose,

```
shabir@shabir-VirtualBox:~/missing_semester$ cat dict.txt | grep -E '^([^s]*a)
{3,}' | grep -Ev 's$' | wc -l
449
```

There are total 130 words that contain at least three as and don’t have a 's ending.

2. **What are the three most common last two letters of those words? sed’s y command, or the tr program, may help you with case insensitivity.**

The command I have written for this purpose,

```
shabir@shabir-VirtualBox:~/missing_semester$ cat dict.txt | grep -E '^([^s]*a)
{3,}' | grep -Ev 's$' | sed -E 's/.*(..)$/\1/' | tr '[:upper:]' '[:lower:]' |
sort | uniq -c | sort -nr | head -n 3
     68 an
     37 al
     26 ly
shabir@shabir-VirtualBox:~/missing_semester$
```

3. **How many of those two-letter combinations are there?**

```
shabir@shabir-VirtualBox:~/missing_semester$ cat dict.txt | grep -E '^
([^s]*a){3,}' | grep -Ev 's$' | sed -E 's/.*(..)$/\1/' | tr '[:upper:]
' '[:lower:]' | sort | uniq -c | wc -l
81
```

There are 81 unique two-letter combinations in those words.

4. **For a challenge: which combinations do not occur?**

```
shabir@shabir-VirtualBox:~/missing_semester$ cat dict.txt | grep -E '^
([^s]*a){3,}' | grep -Ev 's$' | rev | cut -c 1-2 | sort | uniq > exist
ing_combinations.txt
shabir@shabir-VirtualBox:~/missing_semester$ cat existing_combinations
.txt | wc -l
81
shabir@shabir-VirtualBox:~/missing_semester$
```

The combinations that do not occurs are,

```
shabir@shabir-VirtualBox:~/missing_semester$ cat existing_combinations
.txt | awk '{print $1}' | paste -sd,
aa,ab,ac,ad,ae,af,ag,ah,ai,aj,ak,al,am,an,ao,ap,ar,at,au,av,aw,ay,az,c
a,ci,da,de,dn,dr,ea,ec,ed,ee,eg,eh,ei,el,en,er,es,et,eu,gn,ha,hp,hs,ht
,in,ir,is,ka,kr,la,ma,ms,na,ni,no,ob,oi,om,oo,os,ov,ra,re,tc,tf,ti,tn,
ts,tt,tu,vo,xa,ya,yl,yp,yr,ys,yt
```