```
*Problem 1;
data gi;
input center $ treat $ response count @@;
n_response=(response='1');
datalines;
a test 1 22      a test 0 13
a placebo 1 33 a placebo 0 19
b test 1 27      b test 0 7
b placebo 1 18 b placebo 0 15
;
run;

proc freq data=gi order=data;
weight count;
tables center*treat*response / chisq cmh(mf) nocol nopct;
run;




*Problem 2;
data rashd;
input treat $ sex $ rash count @@;
datalines;
placebo m 0 6 placebo m 1 10      placebo m 2 12      placebo m 3 20
placebo f 0 7   placebo f 1 14 placebo f 2 19 placebo f 3 18
low m 0 9           low  m 1 7    low  m 2 30    low  m 3 19
low f 0 10          low  f 1 17    low  f 2 11      low  f 3 16
high m 0 19         high      m 1 15    high      m 2 17    high      m 3 5
high f 0 21     high      f 1 18    high      f 2 10    high      f 3 5
;
run;

data rashp;
input treat sex rash count;
datalines;
1    1    1    44
1    0    1    56
1    1    1    33
1    0    1    37
1    1    0    10
1    0    0    9
1    1    0    21
1    0    0    19
0    0    1    42
0    1    1    51
0    0    0    6
0    1    0    7
;
run;

proc freq data=rashp order=data;
weight count;
tables sex*treat*rash / chisq cmh(mf) nocol nopct;
```

```
run;

proc logistic data=rashp order=data;
freq count;
model rash= treat sex;
oddsratio sex;
run;

proc logistic data=rashp order=data;
freq count;
class treat(ref="0") sex(ref="0") / param=ref;
model rash= treat|sex / aggregate;
oddsratio sex;
run;

*Problem 3;
data teeth;
input toothex $ jaw $ insurance count @@;
datalines;
none       upper 0 279    none upper 1 193    none upper 2 373
none       lower 0 149    none lower 1 83     none lower 2 137
one  upper 0 69     one upper  1 21           one  upper 2 81
one  lower 0 29     one lower  1 44       one  lower 2 75
twoplus upper 0 45 twoplus upper 1 33 twoplus upper 2 24
twoplus lower 0 21 twoplus lower 1 12 twoplus lower 2 19
;
run;

data teeth1;
input toothex jaw $ insurance count @@;
datalines;
0      upper 0 279     0 upper 1 193 0 upper 2 373
0      lower 0 149     0 lower 1 83  0 lower 2 137
1      upper 0 69      1 upper 1 21  1  upper 2 81
1      lower 0 29      1 lower 1 44  1  lower 2 75
1      upper 0 45      1 upper 1 33  1 upper 2 24
1      lower 0 21      1 lower 1 12  1 lower 2 19
;
run;


*Part a;
proc freq data=teeth1 order=data;
weight count;
tables jaw*toothex*insurance / all chisq cmh(mf) nocol nopct scores=modridit;
run;

*Part c;
data teeth2;
input toothex high count @@;
datalines;
0     1 510     0 0 704
1     1 156     1 0 163
2     1 43 2 0 111
```

```
;
run;

proc freq data=teeth2 order=data;
weight count;
tables high*toothex / all chisq cmh(mf) nocol nopct;
run;

*Part d;
data teeth3;
input jaw $ toothex high count @@;
datalines;
lower 0 1 137  lower 0 0 232
lower 1 1 75   lower 1 0 73
lower 2 1 19   lower 2 0 33
upper 0 1 373  upper 0 0 472
upper 1 1 81   upper 1 0 90
upper 2 1 24   upper 2 0 78
;
run;

proc freq data=teeth3 order=data;
weight count;
tables jaw*high*toothex / all chisq cmh(mf) nocol nopct;
run;

*Problem 4;
data drug;
input druga $ drugb $ drugc $ count;
datalines;
F F F 6
F F U 16
F U F 2
F U U 4
U F F 2
U F U 4
U U F 6
U U U 6
;
run;

data drug2; set drug;
keep patient drug response;
retain patient 0;
do i=1 to count;
patient=patient+1;
drug='A'; response=druga; output;
drug='B'; response=drugb; output;
drug='C'; response=drugc; output;
end;

proc print data=drug2;
run;
```

```
proc logistic data=drug2;
class drug(ref="A") /param=ref;
strata patient;
model response(event="F")= drug / aggregate alpha=.01;
oddsratio drug;
run;

*Part c;
proc logistic data=drug2;
class drug(ref="A") /param=ref;
strata patient;
model response(event="F")= drug / alpha=.05;
contrast "b vs c" drug 1 -1;
run;
```