```sas
/* 도수분포표 freq */

data Ex3_1;
input x @@;
cards;
3 3 2 0 5 4 6 4 4 3 2 1 2 3 0 5 5 3 2 3 5 4 1 2 0 3 2 4 2 6
;
proc freq data=Ex3_1;
  table x;
run;
proc freq data=Ex3_1;
  table x / norow ; /* 행 제외 */
run;
proc freq data=Ex3_1;
  table x / nocol; /* 열 제외 */
run;
proc freq data=Ex3_1;
  table x / nopercent ; /* 퍼센트 제외 */
run;
proc freq data=Ex3_1;
  table x / nocum ; /* 누적을 제외 */
run;
proc freq data=Ex3_1;
  table x / plots; /* 도수산점도 작성 */
run;

data Ex3_1_1;
input x @@;
cards;
3 3 2 0 5 4 6 . 4 3 2 . 2 3 0 5 5 3 . 3 5 4 1 2 0 3 2 4 2 6
;
proc freq data=Ex3_1_1;
  table x / missing;
run;
proc freq data=Ex3_1_1;
  table x;
run;

data Ex3_2;
infile "C:\Users\CBNU\Desktop\score3-2.txt";
input id name $ gender $ dept $ atten report mid fin @@;
proc print;
run;
proc freq data=Ex3_2;
  table gender; /* 성별에 관하여 */
```

```sas
run;
proc freq data=Ex3_2;
  table dept; /* 학과에 관하여 */
run;
proc freq data=Ex3_2;
  table dept*dept ; /* 성별,학과에 관하여 2차원 도수분포표*/
run;
proc freq data=Ex3_2;
  table dept dept ; /* 성별,학과에 관하여 도수분포표*/
run;
proc freq data=Ex3_2;
  table dept*dept/ list; /* 성별,학과에 관하여 2차원 도수분포표를 1차원으로 변환*/
run;
proc freq data=Ex3_2;
  table dept*dept / norow nocol nopercent ; /* 행, 열, 전체 퍼센테이지 제한 */
run;
proc freq data=Ex3_2;
  table dept*dept / norow nocol ; /* 행, 열 퍼센테이지 제한 */
run;


proc sort data=Ex3_2 out=Ex3_2_out;
  by gender;
run;
proc freq data=Ex3_2_out;
  by gender;
  table dept / nopercent;
run;



data Ex3_3;
input gender $ age chol @@;
cards;
M 23 40 M 64 88 M 66 110 M 31 86 M 55 137 M 48 78 M 31 46
M 58 11 M 31 88 M 27 80 M 25 66 M 23 65 F 40 60 F 38 53
F 56 89 F 34 99 F 78 110 F 45 100 F 20 89 F 56 78 F 44 99
F 30 89 F 24 57 F 89 100 F 80 90 F 22 60
;
proc means data=Ex3_3 range min max; /* 수리계산할때 s꼭 붙어야함. means */
  var age;
run;

data Ex3_3_1;
set Ex3_3;
if (age <= 34) then class = 1;
  else if (age <= 49) then class = 2;
```

```sas
        else if (age <= 64) then class = 3;
            else if (age <= 79) then class = 4;
                else class = 5;
proc freq data=Ex3_3_1;
  table class;
run;


data Ex3_3_2;
set Ex3_3;
proc freq data=Ex3_3_2;
  table gender;
run;
proc sort data=Ex3_3_2 out=Ex3_3_2_out ;
  by gender;
proc freq data=Ex3_3_2_out;
  by gender;
  table gender;
run;


data Ex3_3_3;
set Ex3_3_1;
 proc format;
  value clafmt 1= '20-34' 2= '35-49' 3= '50-64' 4= '65-79' 5= '80-' ;
  value $genfmt 'F'='여학생' 'M'='남학생';
proc freq data=Ex3_3_3;
  table class;
  format class clafmt.;
run;
proc freq data=Ex3_3_3;
  table gender;
  format gender $genfmt.;
run;



/* 테이블 tabulate */



data Ex3_6;
input team $ classrm $ name $ pencils tablets @@;
sales = pencils+tablets;
cards;
BLUE A ANN 4 8 RED A MARY 5 10
GREEN A JOHN 6 4 RED A BOB 2 3
BLUE B FRED 6 8 GREEN B LOUISE 12 2
BLUE B ANNETTE . 9 RED B HENRY 8 10
```

```
GREEN A ANDREW 3 5 RED A SAMUEL 12 10
BLUE A LINDA 7 12 GREEN A SARA 4 .
BLUE B MARTIN 9 13 RED B MATTHEW 7 6
GREEN B BETH 15 10 RED B LAURA 4 3
;
proc print;
run;
proc format;
  picture pctfmt num='009 %'; /* 입력값 그대로에서 9자리와 퍼센트를 지정해줌 */
run;
proc tabulate data=Ex3_6;
  class team classrm;
  var sales;
  table team all,
classrm='classroom'*sales=''*(sum*f=10.       colpctsum*f=pctfmt.       rowpctsum*f=pctfmt.
reppctsum*f=pctfmt.) all*sales*f=10.;
run;
proc tabulate data=Ex3_6;
  class team classrm;
  var sales;
  table team all,
classrm='classroom'*sales=''*(n             colpctsum*f=pctfmt.          rowpctsum*f=pctfmt.
reppctsum*f=pctfmt.) all*sales*n;
run;


data Ex3_7;
set Ex3_3_1;
proc format;
  value $genfmt 'F'='여성' 'M'='남성';
  value clafmt 1='20-34' 2='35-49' 3='50-64' 4='65-79' 5='80+';
run;
proc tabulate data=Ex3_7;
  class gender;
  var age;
  table age='연령'*mean='평균연령', gender='성별'/ box = [label='성별 평균연령'];
  format gender $genfmt. ;
run;
proc tabulate data=Ex3_7;
  class gender class;
  table class='연령계급' all='합계', gender='성별'*n='인원수' all='합계'*n='인원수';
  format gender $genfmt. class clafmt. ;
run;
proc tabulate data=Ex3_7;
  class class;
```

```sas
  var chol;
  table class='연령계급', chol='콜레스테롤'*mean='평균';
  format class clafmt. ;
run;



data Ex3_8;
input region division state $ type expenditures @@;
cards;
1 1 ME 1 708 1 1 ME 2 379 1 1 NH 1 597 1 1 nH 2 301 1 1 VT 1 353
1 1 VT 2 188 1 1 Ma 1 3264 1 1 MA 2 2498 1 1 RI 1 531 1 1 RI 2 358
1 1 CT 1 2024 1 1 CT 2 1405 1 2 NY 1 8786 1 2 NY 2 7825 1 2 NJ 1 4115
1 2 NJ 2 35588 1 2 PA 1 6478 1 2 PA 2 3695 4 3 MT 1 322 4 3 MT 2 232
4 3 ID 1 392 4 3 ID 2 298 4 3 WY 1 194 4 3 WY 2 184 4 3 CO 1 1215
4 3 CO 2 1173 4 3 NM 1 545 4 3 NM 2 578 4 3 AZ 1 1694 4 3 AZ 2 1448
4 3 UT 1 621 4 3 UT 2 438 4 3 NV 1 493 4 3 NV 2 378 4 4 WA 1 1680
4 4 WA 2 1122 4 4 OR 1 1014 4 4 OR 2 756 4 4 CA 1 10643
4 4 CA 2 10114 4 4 AK 1 349 4 4 AK 2 329 4 4 HI 1 273 4 4 HI 2 298
;
proc tabulate data=Ex3_8;
  class division type;
  table division*(n rowpctn colpctn pctn), type ;
run;



data Ex3_9;
input id name $ gender $ dept $ atten report mid fin;
total = atten+ report+ mid +fin;
cards;
023401 SK.KIM M STAT 10 20 40 30
023405 SI.HWANG M STAT 10 18 38 28
023410 KS.LEE M MATH 10 19 38 30
023411 SS.LEE F MATH 10 20 29 30
023412 MS.SOE F ECON 10 20 30 30
023415 NR.JUNG F ECON 10 15 20 30
023420 KW.YEUM M STAT 10 19 34 30
023425 HJ.KIM M STAT 10 20 33 28
023426 NK.LEE F ECON 10 20 5 10
023458 JS.BAE M MATH 10 20 38 30
;
proc means data=Ex3_9 mean std ;
class gender;
var total;
run;
proc means data=Ex3_9 mean std;
```

```sas
class dept;
var total;
run;
proc means data=Ex3_9 mean std cv median q1 q3 skewness kurtosis maxdec=3;
class dept;
var total;
run;



data Ex3_10;
input lastname $ age presentscore tastescore flavor $ layers;
cards;
sdfsf 27 93 80 v 1
rhfgsdg 32 84 72 r 2
sfuae 46 68 75 v 1
wiieowjh 38 79 73 r 2
njknjkb 23 77 84 c .
iwoefsml 51 86 91 s 3
snflekfmdl 62 72 38 s 1
sfsdfegeg 93 81 32 c 3
;
proc means data=Ex3_10 n mean max min range std maxdec=4;
var presentscore tastescore;
run;



data Ex3_11;
input name $ gender $  status year section $ score finalgrade ;
cards;
Abbott    F 2 97 A 90 87
Branford  M 1 98 A 92 97
Crandell  M 2 98 B 81 71
Dennison  M 1 97 A 85 72
Edgar     F 1 98 B 89 80
Faust     M 1 97 B 78 73
Greeley   F 2 97 A 82 91
Hart      F 1 98 B 84 88
Isley     M 2 97 A 88 86
Jasper    M 1 97 B 91 93
;
proc means data=Ex3_11 maxdec=3;
class status year;
var score;
types () status*year;
run;
```

```sas
data Ex3_12;
set Ex3_11;
proc means data=Ex3_12 mean std maxdec=3 ;
class year status;
var score;
ways 1 2;
run;



data Ex3_13;
input money freq @@;
cards;
10 3
15 5
20 5
25 2
30 1
;
proc means data=Ex3_13 mean std maxdec=3;
var money;
freq freq;
output out='outss' mean='ee' std=tt ;
proc print data=outss;
run;



data Ex3_13;
input id name $ gender $ dept $ atten report mid fin;
total = atten+ report+ mid +fin;
cards;
023401 SK.KIM M STAT 10 20 40 30
023405 SI.HWANG M STAT 10 18 38 28
023410 KS.LEE M MATH 10 19 38 30
023411 SS.LEE F MATH 10 20 29 30
023412 MS.SOE F ECON 10 20 30 30
023415 NR.JUNG F ECON 10 15 20 30
023420 KW.YEUM M STAT 10 19 34 30
023425 HJ.KIM M STAT 10 20 33 28
023426 NK.LEE F ECON 10 20 5 10
023458 JS.BAE M MATH 10 20 38 30
;
proc univariate data=Ex3_13 ;
var total;
```

```sas
run;
proc sort data=Ex3_13 ;
by dept;
proc univariate data=Ex3_13 plot ;
var mid;
by dept;
run;
proc univariate data=Ex3_13 noprint ;
var total;
histogram total;
run;
proc univariate data=Ex3_13 noprint;
var total;
output out=out1 mean=mn std=ss;
proc print data=out1;
run;
proc univariate data=Ex3_13;
var total;
output out= out2 pctlpre=p pctlpts=10,20,30,40,50,60,70,80,90;
proc print;
run;


data Ex3_14;
input id name $ gender $ dept $ atten report mid fin;
total = atten+ report+ mid +fin;
cards;
023401 SK.KIM M STAT 10 20 40 30
023405 SI.HWANG M STAT 10 18 38 28
023410 KS.LEE M MATH 10 19 38 30
023411 SS.LEE F MATH 10 20 29 30
023412 MS.SOE F ECON 10 20 30 30
023415 NR.JUNG F ECON 10 15 20 30
023420 KW.YEUM M STAT 10 19 34 30
023425 HJ.KIM M STAT 10 20 33 28
023426 NK.LEE F ECON 10 20 5 10
023458 JS.BAE M MATH 10 20 38 30
;
proc summary data=Ex3_14 sum mean std min max maxdec=3 print;
var total;
run;
```