Question 1) a and b

#CODE

```sas
data z;
    input x 1 y 3-6;
    datalines;
1 3.2
2 4.5
3 5.2
4 9.3
5 11.6
;
run;

proc print data=z;
run;

proc means data=z N mean std;
    title "Mean and Standard deviation of x and y";
run;
```

#OUTPUT

Obs	x	y
1	1	3.2
2	2	4.5
3	3	5.2
4	4	9.3
5	5	11.6

Mean and Standard deviation of x and y

The MEANS Procedure

Variable	N	Mean	Std Dev
x	5	3.0000000	1.5811388
y	5	6.7600000	3.5387851

Question 2) a and b

#CODE

```sas
data china;
    infile '/home/u64025319/sasuser.v94/Elliott and Morrell/China#1.dat';
    input year total total_exports total_imports;
    balance=total_exports - total_imports; *trade balance;
run;

data china;
    set china;
    drop total;
run;

proc print data=china;
    title 'China Exports, Imports, and Trade Balance';
run;

data balance;
    set china(keep=balance);
run;

proc print data=balance;
    title 'balance';
run;
```

#OUTPUT

Obs	year	total_exports	total_imports	balance
1	1955	1.41	1.73	-0.32
2	1956	1.65	1.56	0.09
3	1957	1.60	1.51	0.09
4	1958	1.98	1.89	0.09
5	1959	2.26	2.12	0.14
6	1960	1.86	1.95	-0.09
7	1961	1.49	1.45	0.04
8	1962	1.49	1.17	0.32
9	1963	1.65	1.27	0.38
10	1964	1.92	1.55	0.37
11	1965	2.23	2.02	0.21
12	1966	2.37	2.25	0.12
13	1967	2.14	2.02	0.12
14	1968	2.10	1.95	0.15
15	1969	2.20	1.83	0.37
16	1970	2.26	2.33	-0.07
17	1971	2.64	2.21	0.43
18	1972	3.44	2.86	0.58
19	1973	5.82	5.16	0.66
20	1974	6.95	7.62	-0.67
21	1975	7.26	7.49	-0.23
22	1976	6.86	6.58	0.28
23	1977	7.59	7.21	0.38
24	1978	9.75	10.89	-1.14
25	1979	13.66	15.68	-2.02
26	1980	18.27	19.55	-1.28
27	1981	20.89	19.48	1.41
28	1982	21.82	17.48	4.34
29	1983	22.20	18.53	3.67
30	1984	24.42	25.36	-0.94
31	1985	25.92	34.33	-8.41
32	1986	27.01	33.08	-6.07
33	1987	34.71	33.40	1.31
34	1988	40.64	39.85	0.79
35	1989	43.44	39.14	4.30

balance

Obs	balance
1	-0.32
2	0.09
3	0.09
4	0.09
5	0.14
6	-0.09
7	0.04
8	0.32
9	0.38
10	0.37
11	0.21
12	0.12
13	0.12
14	0.15
15	0.37
16	-0.07
17	0.43
18	0.58
19	0.66
20	-0.67
21	-0.23
22	0.28
23	0.38
24	-1.14
25	-2.02
26	-1.28
27	1.41
28	4.34
29	3.67
30	-0.94
31	-8.41
32	-6.07

33	1.31
34	0.79
35	4.30

#COMMENT

The data shows that China's exports and imports grew significantly from 1955 to 1989, with trade values increasing from less than 2 in the 1950s to nearly 40 by 1989. In the early years, the trade balance was small and close to zero, indicating balanced trade. From the 1970s onward, both exports and imports rose quickly, but the balance fluctuated between surpluses and deficits. In the mid-1980s, imports grew faster than exports, leading to large trade deficits. Overall, the data suggests rapid growth in China's international trade, but with instability in the trade balance.

Question 2) c

#CODE

```
data china;
    set china;

    if year >=1950 and year < 1960 then
        decade=1950;
    else if year >=1960 and year < 1970 then
        decade=1960;
    else if year >=1970 and year < 1980 then
        decade=1970;
    else if year >=1980 then
        decade=1980;
run;

proc print data=china;
    title 'Total Exports, Total Imports and Decade';
run;
```

#OUTPUT

Total Exports, Total Imports and Decade

Obs	year	total_exports	total_imports	balance	decade
1	1955	1.41	1.73	-0.32	1950
2	1956	1.65	1.56	0.09	1950
3	1957	1.60	1.51	0.09	1950
4	1958	1.98	1.89	0.09	1950
5	1959	2.26	2.12	0.14	1950
6	1960	1.86	1.95	-0.09	1960
7	1961	1.49	1.45	0.04	1960
8	1962	1.49	1.17	0.32	1960
9	1963	1.65	1.27	0.38	1960
10	1964	1.92	1.55	0.37	1960
11	1965	2.23	2.02	0.21	1960
12	1966	2.37	2.25	0.12	1960
13	1967	2.14	2.02	0.12	1960
14	1968	2.10	1.95	0.15	1960
15	1969	2.20	1.83	0.37	1960
16	1970	2.26	2.33	-0.07	1970
17	1971	2.64	2.21	0.43	1970
18	1972	3.44	2.86	0.58	1970
19	1973	5.82	5.16	0.66	1970
20	1974	6.95	7.62	-0.67	1970
21	1975	7.26	7.49	-0.23	1970
22	1976	6.86	6.58	0.28	1970
23	1977	7.59	7.21	0.38	1970
24	1978	9.75	10.89	-1.14	1970
25	1979	13.66	15.68	-2.02	1970
26	1980	18.27	19.55	-1.28	1980
27	1981	20.89	19.48	1.41	1980
28	1982	21.82	17.48	4.34	1980
29	1983	22.20	18.53	3.67	1980
30	1984	24.42	25.36	-0.94	1980
31	1985	25.92	34.33	-8.41	1980

32	1986	27.01	33.08	-6.07	1980
33	1987	34.71	33.40	1.31	1980
34	1988	40.64	39.85	0.79	1980
35	1989	43.44	39.14	4.30	1980

Question 2) d

#CODE

```
proc print data=china;
    where year >=1980;
    title 'In Order of Year 1980' run;
```

In Order of Year 1980

Obs	year	total_exports	total_imports	balance	decade
26	1980	18.27	19.55	-1.28	1980
27	1981	20.89	19.48	1.41	1980
28	1982	21.82	17.48	4.34	1980
29	1983	22.20	18.53	3.67	1980
30	1984	24.42	25.36	-0.94	1980
31	1985	25.92	34.33	-8.41	1980
32	1986	27.01	33.08	-6.07	1980
33	1987	34.71	33.40	1.31	1980
34	1988	40.64	39.85	0.79	1980
35	1989	43.44	39.14	4.30	1980

Question 3) a

#CODE

```
data SouthAfrican;
    infile '/home/u64025319/sasuser.v94/Elliott and Morrell/btt.dat';
    input id sec bweight gestage momage parity mdbp msbp momedu mmedaid socio dpb5
        sbp5 ht5 wt5 hdl5 ldl5 trig5 smoke5 memaid5 socio5;

data SouthAfrican;
    set SOuthafrican;
    BMI=wt5 /(ht5*ht5);
run;

data SouthAfrican_new;
    set SouthAfrican (obs=10 keep=id ht5 wt5 BMI);
run;

Proc print data=SouthAfrican_new;
    title 'South African children with BMI data';
run;
```

#OUTPUT

South African children with BMI data

Obs	id	ht5	wt5	BMI
1	1	1.025	13.5	12.8495
2	2	1.123	18.5	14.6694
3	3	1.090	19.8	16.6653
4	4	1.113	20.4	16.4680
5	5	1.065	18.3	16.1344
6	6	1.063	17.3	15.3102
7	7	1.112	19.2	15.5271
8	8	1.134	19.5	15.1638
9	9	1.039	16.6	15.3772
10	10	1.118	17.9	14.3209

Question 3) b

#CODE

```
*Question 3) b;

data SouthAfrican;
    set SouthAfrican(obs=30);

    if msbp >=140 and mdbp>=90 then
        htn=1;
    *Hyertension;
    else if msbp >=140 and mdbp<90 then
        htn=2;
    *Isolated Systolic Hypertension;
    else if msbp < 140 and mdbp>=90 then
        htn=3;
    * Isolated diastolic hypertension;
    else if msbp <140 and mdbp< 90 then
        htn=4;
    *Normotensive;
run;

proc format;
    value htnfmt 1='Hyertension'
    2='Isolated Systolic Hypertension'
    3='Isolated diastolic hypertension'
    4='Normotensive';
run;

data SouthAfrican;
    set SouthAfrican;
    format htn htnfmt.;
run;

proc print data=SouthAfrican;
    var id msbp mdbp htn;
    title 'child id, sbp, dbp and classification';
run;
```

#OUTPUT

child id, sbp, dbp and classification

Obs	id	msbp	mdbp	htn
1	1	110	70	Normotensive
2	2	110	80	Normotensive
3	3	90	50	Normotensive
4	4	110	60	Normotensive
5	5	120	80	Normotensive
6	6	100	60	Normotensive
7	7	100	70	Normotensive
8	8	110	80	Normotensive
9	9	90	60	Normotensive
10	10	120	80	Normotensive
11	11	100	50	Normotensive
12	12	120	80	Normotensive
13	13	110	60	Normotensive
14	14	120	80	Normotensive
15	15	110	70	Normotensive
16	16	120	80	Normotensive
17	17	110	70	Normotensive
18	18	90	60	Normotensive
19	19	120	70	Normotensive
20	20	100	70	Normotensive
21	21	100	70	Normotensive
22	22	100	70	Normotensive
23	23	130	90	Isolated diastolic hypertension
24	24	80	60	Normotensive
25	25	110	80	Normotensive
26	26	120	80	Normotensive
27	27	110	80	Normotensive
28	28	120	70	Normotensive
29	29	110	70	Normotensive
30	30	100	60	Normotensive

Question 4) a

#CODE

```sas
DATA One;
    input ID Name $ Prescore;
    datalines;
11 Joe 19
13 Darcy 22
12 Ted 21
14 Jenny 23
16 Chris 17
18 Jane 21
19 Jeff 24
15 Bill 18
17 Bill 22
;
run;

proc print data=One;
    title 'Table One';
run;

data Two;
    input ID Postscore;
    datalines;
12 22
11 39
13 42
17 42
14 21
19 18
15 11
16 37
20 21
;
run;

proc print data=Two;
    title 'Table Two';
run;
```

#OUTPUT

Table One

Obs	ID	Name	Prescore
1	11	Joe	19
2	13	Darcy	22
3	12	Ted	21
4	14	Jenny	23
5	16	Chris	17
6	18	Jane	21
7	19	Jeff	24
8	15	Bill	18
9	17	Bill	22

Table Two

Obs	ID	Postscore
1	12	22
2	11	39
3	13	42
4	17	42
5	14	21
6	19	18
7	15	11
8	16	37
9	20	21

Question 4) b

#CODE

```
*Question 4) b;

proc sort data=One;
    by ID;
run;

proc sort data=Two;
    by ID;
run;

proc print data=One;
    title 'Sorted One';
run;

proc print data=Two;
    title 'Sorted Two';
run;

data OneTwo;
    merge One Two;
    by ID;
run;

proc print data=OneTwo;
    title 'Merged-Sorted One Two tables';
run;
```

#OUTPUT

Sorted One

Obs	ID	Name	Prescore
1	11	Joe	19
2	12	Ted	21
3	13	Darcy	22
4	14	Jenny	23
5	15	Bill	18
6	16	Chris	17
7	17	Bill	22
8	18	Jane	21
9	19	Jeff	24

Sorted Two

Obs	ID	Postscore
1	11	39
2	12	22
3	13	42
4	14	21
5	15	11
6	16	37
7	17	42
8	19	18
9	20	21

Merged-Sorted One Two tables

Obs	ID	Name	Prescore	Postscore
1	11	Joe	19	39
2	12	Ted	21	22
3	13	Darcy	22	42
4	14	Jenny	23	21
5	15	Bill	18	11
6	16	Chris	17	37
7	17	Bill	22	42
8	18	Jane	21	.
9	19	Jeff	24	18
10	20		.	21

#EXPLAINATION

The peculiarities in the merged **OneTwo** dataset arise because some IDs exist in only one dataset and because of potential duplicates. For example, ID 18 exists in One but not in Two, so its Postscore is missing, while ID 20 exists in Two but not in One, so Name and Prescore are missing. Additionally, if any dataset had duplicate IDs, SAS merges row by row after sorting, which could cause misalignment or unexpected missing values.

Question 4) c

#CODE

```
*Question 4) c;

data OneTwo2;
    set OneTwo;

    if Prescore=. or Postscore=. then
        delete;
run;

proc print data=OneTwo2;
    title 'OneTwo with No Missing Values';
run;
```

#OUTPUT

OneTwo with No Missing Values

Obs	ID	Name	Prescore	Postscore
1	11	Joe	19	39
2	12	Ted	21	22
3	13	Darcy	22	42
4	14	Jenny	23	21
5	15	Bill	18	11
6	16	Chris	17	37
7	17	Bill	22	42
8	19	Jeff	24	18

Since it has no missing values, it is now ready for a pre/post-test analysis.