```
// (1);
DATA scenic;
    LENGTH
        ID                8
        log10             8
        age               8
        infection         8
        culturing         8
        xray              8
        bednum            8
        medschool         8
        region            8
        census            8
        nursenum          8
        facilities        8
        region2           8
        region3           8
        region4           8 ;
    FORMAT
        ID               BEST12.
        log10            BEST12.
        age              BEST12.
        infection        BEST12.
        culturing        BEST12.
        xray             BEST12.
        bednum           BEST12.
        medschool        BEST12.
        region           BEST12.
        census           BEST12.
        nursenum         BEST12.
        facilities       BEST12.
        region2          BEST12.
        region3          BEST12.
        region4          BEST12. ;
    INFORMAT
        ID               BEST12.
        log10            BEST12.
        age              BEST12.
        infection        BEST12.
        culturing        BEST12.
        xray             BEST12.
        bednum           BEST12.
        medschool        BEST12.
        region           BEST12.
        census           BEST12.
        nursenum         BEST12.
        facilities       BEST12.
        region2          BEST12.
        region3          BEST12.
        region4          BEST12. ;
    INFILE 'C:\Users\ac991\AppData\Roaming\SAS\EnterpriseGuide\EGTEMP\SEG-6512-8198ed07\contents\senicrev2-
withdummyvariables(1)-6031c3223a684a1b901d3ee5f3c81274.txt'
        LRECL=56
        ENCODING="WLATIN1"
        TERMSTR=CRLF
        DLM='7F'x
        MISSOVER
        DSD ;
    INPUT
        ID               : BEST32.
        log10            : BEST32.
        age              : BEST32.
        infection        : BEST32.
        culturing        : BEST32.
        xray             : BEST32.
        bednum           : BEST32.
        medschool        : BEST32.
        region           : BEST32.
        census           : BEST32.
        nursenum         : BEST32.
        facilities       : BEST32.
        region2          : BEST32.
        region3          : BEST32.
        region4          : BEST32. ;

proc reg data =  scenic;
    model log10 = age infection culturing xray bednum medschool census nursenum facilities region2 region3 region4 /
    selection = backward slstay=0.01;
RUN;

/****
Step 1, we started from the full model with all predictors, and deleted the variable culturing with the large p values.
Step 2, we reevaluated the model, we deleted the variable facilities with the large p value.
Step 3, we reevaluated the model, we deleted the variable medschool with the large p value.
Step 4, we reevaluated the model, we deleted the variable bednum with the large p value.
Step 5, we reevaluated the model, we deleted the variable xray with the large p value.
Step 6, we reevaluated the model, we deleted the variable nursenum with the large p value.
Step 7, we reevaluated the model, we deleted the variable region2 with the large p value.
Step 8, we reevaluated the model, we deleted the variable census with the large p value.
Step 9, we reevaluated the model, we deleted the variable region3 with the large p value.
Step 10, we reevaluated the model, we deleted the variable age with the large p value.
```

```
Step 11, we reevaluated the model, we deleted the variable region4 with the large p value.
Finally, we got the best fitting model with the independent variables-
please list the final list of independent variables in the model
and report R^2 and how much variance of Y is explained by the model.
****/

// (2);
PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.infection, T.log10
    FROM WORK.SCENIC as T
;
QUIT;
SYMBOL1    INTERPOL=BOX    VALUE=CIRCLE
    HEIGHT=1
    MODE=EXCLUDE
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE

;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE

;
TITLE;
TITLE1 "Box Plot";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
    PLOT log10 * infection/
    VAXIS=AXIS1

    HAXIS=AXIS2

;
/* ---------------------------------------------------------------------
   End of task code
   --------------------------------------------------------------------- */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/* ---------------------------------------------------------------------
   Sort data set Local:WORK.SCENIC
   --------------------------------------------------------------------- */

PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.infection
    FROM WORK.SCENIC as T
;
QUIT;
TITLE;
TITLE1 "Capability analysis of: infection";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
    ODS EXCLUDE EXTREMEOBS MODES MOMENTS QUANTILES;
PROC CAPABILITY DATA = WORK.SORTTempTableSorted
        CIBASIC(TYPE=TWOSIDED ALPHA=0.05)
        MU0=0
;
    VAR infection;
    ;
    HISTOGRAM  infection / NORMAL    (   W=1    L=1    COLOR=YELLOW  MU=EST SIGMA=EST)

    CAXIS=PURPLE
    CTEXT=BLACK
    CFRAME=WHITE
    CBARLINE=BLACK
    CFILL=GRAY
;
/* ---------------------------------------------------------------------
   End of task code
   --------------------------------------------------------------------- */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;

/* the data seems normal */

/** (B) **/
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
/* ---------------------------------------------------------------------
   Sort data set Local:WORK.SCENIC
```

```
   ---------------------------------------------------------------------- */

PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.infection, T.log10
    FROM WORK.SCENIC as T
;
QUIT;
    SYMBOL1
    INTERPOL=NONE
    HEIGHT=10pt
    VALUE=CIRCLE
    LINE=1
    WIDTH=2

    CV = _STYLE_
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
TITLE;
TITLE1 "Scatter Plot";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
PLOT log10 * infection /
    VAXIS=AXIS1

    HAXIS=AXIS2

FRAME ;
/* ----------------------------------------------------------------------
   End of task code
   ---------------------------------------------------------------------- */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/*******
the average of the residual error is not close to 0.
the spread of the residual errors constant from left to right.
the pattern do not suggest a need of tranformation of Y because the distributions is not highly skewed.
There are outliers. My suggestion for further analysis is to set upper and lower limits
*******/

/* (c)*/
PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.culturing, T.log10
    FROM WORK.SCENIC as T
;
QUIT;
    SYMBOL1
    INTERPOL=NONE
    HEIGHT=10pt
    VALUE=CIRCLE
    LINE=1
    WIDTH=2

    CV = _STYLE_
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
TITLE;
TITLE1 "Scatter Plot";
FOOTNOTE;
```

```
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
PLOT log10 * culturing /
    VAXIS=AXIS1

    HAXIS=AXIS2

FRAME ;
/* ---------------------------------------------------------------
   End of task code
   --------------------------------------------------------------- */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/** the pattern does not suggest y or x need to be tranformed **/

PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.culturing, T.log10
    FROM WORK.SCENIC as T
;
QUIT;
    SYMBOL1
    INTERPOL=NONE
    HEIGHT=10pt
    VALUE=CIRCLE
    LINE=1
    WIDTH=2

    CV = _STYLE_
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
TITLE;
TITLE1 "Scatter Plot";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
PLOT log10 * culturing /
    VAXIS=AXIS1

    HAXIS=AXIS2

FRAME ;
/* ---------------------------------------------------------------
   End of task code
   --------------------------------------------------------------- */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/** the pattern does not suggest y or x need to be tranformed **/

PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.medschool, T.log10
    FROM WORK.SCENIC as T
;
QUIT;
    SYMBOL1
    INTERPOL=NONE
    HEIGHT=10pt
    VALUE=CIRCLE
    LINE=1
    WIDTH=2

    CV = _STYLE_
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE
```

```
;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
TITLE;
TITLE1 "Scatter Plot";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
PLOT log10 * medschool /
    VAXIS=AXIS1

    HAXIS=AXIS2

FRAME ;
/* ------------------------------------------------------------------
   End of task code
   ------------------------------------------------------------------ */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/** X needs to be transformed **/

PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.bednum, T.log10
    FROM WORK.SCENIC as T
;
QUIT;
    SYMBOL1
    INTERPOL=NONE
    HEIGHT=10pt
    VALUE=CIRCLE
    LINE=1
    WIDTH=2

    CV = _STYLE_
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
TITLE;
TITLE1 "Scatter Plot";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
PLOT log10 * bednum /
    VAXIS=AXIS1

    HAXIS=AXIS2

FRAME ;
/* ------------------------------------------------------------------
   End of task code
   ------------------------------------------------------------------ */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/** X needs to be transformed **/

PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.xray, T.log10
    FROM WORK.SCENIC as T
;
QUIT;
    SYMBOL1
    INTERPOL=NONE
    HEIGHT=10pt
    VALUE=CIRCLE
```

```
    LINE=1
    WIDTH=2

    CV = _STYLE_
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
TITLE;
TITLE1 "Scatter Plot";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
PLOT log10 * xray /
    VAXIS=AXIS1

    HAXIS=AXIS2

FRAME ;
/* ---------------------------------------------------------------
   End of task code
   --------------------------------------------------------------- */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/** the pattern does not suggest y or x need to be tranformed **/

PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.nursenum, T.log10
    FROM WORK.SCENIC as T
;
QUIT;
    SYMBOL1
    INTERPOL=NONE
    HEIGHT=10pt
    VALUE=CIRCLE
    LINE=1
    WIDTH=2

    CV = _STYLE_
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
TITLE;
TITLE1 "Scatter Plot";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
PLOT log10 * nursenum /
    VAXIS=AXIS1

    HAXIS=AXIS2

FRAME ;
/* ---------------------------------------------------------------
   End of task code
   --------------------------------------------------------------- */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/** X needs to be transformed **/
```

```
PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.census, T.log10
    FROM WORK.SCENIC as T
;
QUIT;
    SYMBOL1
    INTERPOL=NONE
    HEIGHT=10pt
    VALUE=CIRCLE
    LINE=1
    WIDTH=2

    CV = _STYLE_
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
TITLE;
TITLE1 "Scatter Plot";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
PLOT log10 * census /
    VAXIS=AXIS1

    HAXIS=AXIS2

FRAME ;
/* ---------------------------------------------------------------
   End of task code
   --------------------------------------------------------------- */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/** X needs to be tranformed **/

PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.age, T.ID
    FROM WORK.SCENIC as T
;
QUIT;
    SYMBOL1
    INTERPOL=NONE
    HEIGHT=10pt
    VALUE=CIRCLE
    LINE=1
    WIDTH=2

    CV = _STYLE_
;
Axis1
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
Axis2
    STYLE=1
    WIDTH=1
    MINOR=NONE


;
TITLE;
TITLE1 "Scatter Plot";
FOOTNOTE;
FOOTNOTE1 "Generated by the SAS System (&_SASSERVERNAME, &SYSSCPL) on %TRIM(%QSYSFUNC(DATE(), NLDATE20.)) at %TRIM(%SYSFUNC(T
PROC GPLOT DATA=WORK.SORTTempTableSorted
;
PLOT ID * age /
    VAXIS=AXIS1

    HAXIS=AXIS2
```

```
FRAME ;
/* ------------------------------------------------------------------
   End of task code
   ------------------------------------------------------------------ */
RUN; QUIT;
%_eg_conditional_dropds(WORK.SORTTempTableSorted);
TITLE; FOOTNOTE;
GOPTIONS RESET = SYMBOL;

/** the pattern does not suggest y or x need to be tranformed **/

/** region2, region3, and region4 need to be tranformed**/

/* (3)

95% Confidence intervals based on my best model is (4.1049, 4.6048)
*/
```