SCHOOL COMPUTING SYSTEM

BY

BAE-YUEH SHIEH

GRADUATE PROJECT

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MASTER OF SCIENCE

in

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Project Committee

________________________ , Chairman

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SECTION ONE — INTRODUCTION

INTRODUCTION

Education system in Taiwan is divided into four levels:
1) Primary school level (grade 1-6)
2) Junior middle school level (grade 7-9)
3) Senior middle school level (grade 10-12)
4) College level

The School Computing System is designed for the junior middle school, but it can be modified for the primary school and the senior middle school easily.

Since the primary education and the junior education are compulsory now, there are many schools and students in Taiwan. Normally, it contains 50 students in one class, and 50 to 100 classes in one school, some large schools even have 120 classes. The traditional way of calculating average and rank position are using simple calculation or abacus. Even though it has been improved by using calculator, it still takes one month to work through 120 classes.

The School Computing System is designed to substitute those clumsy ways of calculating, to leave schools much time to improve teaching.

There are seven programs in the system, each fulfills a particular function. The functions are as follows:
1) Create an ISAM File to store student's scores
2) Get semester and graduate test scores
3) Calculate average and rank position in one class
4) Update data
5) Make decision of pass, fail or retest
6) Print reports
7) Statistical analysis, predict and evaluate

The system is coded in ANSI COBOL, hardware is IBM 4331 with DOS/VSE. Since the programs are structured form, they can be modified with more advanced functions without difficulties. Besides, file capacities can be increased limited only by hardware.
FORMULAS USED FOR CALCULATION:

1) For semester and year average

\[
\text{Average}(I) = \frac{\sum_{J=1}^{N} (\text{Score}(I,J) \times \text{Credit-Hour}(I,J))}{\text{Total-Credit-Hour}(I)}
\]

<table>
<thead>
<tr>
<th>I</th>
<th>J</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>9</th>
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<tbody>
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<td>6</td>
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<td>1</td>
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<td>4</td>
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<td>3</td>
<td>Grade 3</td>
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<td>4</td>
<td>Grad. Test</td>
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<td>6</td>
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<td>6</td>
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<td>5</td>
<td>Graduation</td>
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<td>6</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>25</td>
</tr>
</tbody>
</table>

Remarks: (Name of Course)

Grade 1: 1(Health Education), 2(Chinese), 3(English), 4(Mathematics), 5(Biology), 6(History), 7(Geography), 8(Music), 9(Drawing), 10(Physical Education)

Grade 2: 1(Chinese), 2(English), 3(Mathematics), 4(Chemistry),

Grade 3: 5(Physics), 6(History), 7(Geography), 8(Music), 9(Drawing), 10(Physical Education)

Graduate Test: 1(Health Education), 2(Chinese), 3(English), 4(Mathematics), 5(Natural Science), 6(History), 7(Geography)

Graduation: 1(Health Education), 2(Chinese), 3(English), 4(Mathematics), 5(Natural Science), 6(Social Science), 7(Music), 8(Drawing), 9(Physical Education)
2) For graduation scores

a. Health Education
   \[ GD\text{-Score} = HE\text{-Year-Score} \times 0.8 + HE\text{-GT-Score} \times 0.2 \]

b. Chinese, English and Mathematics
   \[ GD\text{-Score} = \left( \frac{\sum_{I=1}^{3} Year\text{-Score}(I)}{3} \right) / 3 \times 0.8 + GT\text{-Score} \times 0.2 \]

c. Natural Science (Biology, Chemistry and Physics)
   \[ GD\text{-Score} = (BIO\text{-Year-Score} + \sum_{I=2}^{3} (CHE\text{-Year-Score}(I) + PHY\text{-Year-Score}(I))) / 5 \times 0.8 + NS\text{-GT-Score} \times 0.2 \]

d. Social Science (History and Geography)
   \[ GD\text{-Score} = \sum_{I=1}^{3} (HST\text{-Year-Score}(I) + GGR\text{-Year-Score}(I)) / 6 \times 0.3 + SS\text{-GT-Score} \times 0.2 \]

e. Music, Drawing and Physical Education
   \[ GD\text{-Score} = \sum_{I=1}^{3} Year\text{-Score}(I) / 3 \]

FORMULAS USED FOR STATISTICS AND PREDICTION:

1) Mean
   \[ \text{Mean} = \frac{\sum_{I=1}^{N} \text{Score}}{N} \]

2) Standard Deviation
   \[ SD = \frac{1}{N} \sqrt{\sum_{I=1}^{N} \text{Score}(I)^2 - \left( \sum_{I=1}^{N} \text{Score}(I) \right)^2} \]

3) Correlation
   \[ r_{xy} = \frac{\left( \sum xy - \frac{1}{N} \sum x \sum y \right)}{\left( \sum x^2 - \frac{1}{N} (\sum x)^2 \right) \left( \sum y^2 - \frac{1}{N} (\sum y)^2 \right)} \]

4) Slope (Regression coefficient)
   a. 1 Predictor
   \[ b_{yx} = \frac{\left( \sum xy - \frac{1}{N} \sum x \sum y \right)}{\left( \sum x^2 - \frac{1}{N} (\sum x)^2 \right)} \]
b. 2 Predictors
\[ \beta_2 = \frac{(r_{12} - r_{13} r_{23})}{(1 - r_{23}^2)} \]
\[ \beta_3 = \frac{(r_{13} - r_{12} r_{23})}{(1 - r_{23}^2)} \]
\[ B_2 = \beta_2 \ast \overline{SD_1} / \overline{SD_2} \]
\[ B_3 = \beta_3 \ast \overline{SD_1} / \overline{SD_3} \]

5) Intercept
   a. 1 Predictor
   \[ a_{yx} = \overline{Y} - b_{yx} \overline{X} \]
   b. 2 Predictors
   \[ A = \overline{X}_1 - B_2 \ast \overline{X}_2 - B_3 \ast \overline{X}_3 \]

6) Coefficient of multiple correlation
\[ R = \sqrt{\beta_2 r_{12} + \beta_3 r_{13}} \]

7) Standard error of estimate
   a. 1 Predictor
   \[ \pm \sigma = \overline{SD}_y \sqrt{1 - r_{xy}^2} \]
   b. 2 Predictors
   \[ \pm \sigma = \overline{SD}_1 \sqrt{1 - R^2} \]

8) Regression equation
   a. 1 Predictor
   \[ \hat{Y} = b_{yx} \overline{X} + a_{yx} \]
   b. 2 Predictors
   \[ \hat{X}_1 = B_2 \overline{X}_2 + B_3 \overline{X}_3 + A \]

FORMULAS USED FOR DECISION OF PASS, FAIL AND RETEST:

1) Pass
   Courses of score below 60 less than or equal to three
2) Retest
   Courses of score below 60 less than five and greater than three
3) Fail
   Courses of score below 60 greater than five
SECTION TWO — SYSTEM LAYOUT

FILES

1 ISAM File

a MISAMF

Student scores information. Created at the beginning of the system been used. Loaded with student number, class number and record status.

Key : M-NUMBER (student number)
Record length : 300
File capacity : 180

(b) SISAMF

Same information as MISAMF. Used to sequential access MISAMF.
(read only)

(c) RISAMF

Same information as MISAMF. Used to random access MISAMF.
(read, write and rewrite)

Once the Master ISAM File (MISAMF) has been created, it can be accessed either sequentially or randomly. The system used SISAMF and RISAMF thereafter for sequential and random processing the Master ISAM File instead of the MISAMF. Both of the SISAMF and RISAMF belonged to the MISAMF.
2 Sequential Files

a SORTIO

Stored student semester or year scores and average before and
after sorted average in descending order
Record length: 65
File capacity: 128

b IOSAVE

Saved student number and record status before rewrite into RISAMF.
Record length: 5
File capacity: 167

c IOSAVF

Kept student number and rank data (P=Pass, W=Down and T=Retest)
before rewrite into RISAMF
Record length: 5
File capacity: 167

d SORTIO2

Held student number, scores and class number for class process or
grade process to print out the reports
Record length: 83
File capacity: 100

e SORTWK1

Sorted work area

<table>
<thead>
<tr>
<th>CAVGPST</th>
<th>PRTRPT</th>
<th>STANDEVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record length: 65</td>
<td>Record length: 83</td>
<td>Record length: 34</td>
</tr>
<tr>
<td>File capacity: 128</td>
<td>File capacity: 100</td>
<td>File capacity: 245</td>
</tr>
</tbody>
</table>
PROGRAMS

1 CICAMF
Create an ISAM File for storing student score data within three years.
Load the MISAMF with student number and class number. Offer the record
status with "A".

2 GLSCRS
Input student scores (semester or graduate test) into MISAMF.

3 CAVGPS
Calculate the average for every semester, year, graduate test and
graduation. Sort the average in descending order and assign the position
in class.

4 UPDATE
Perform update MISAMF which include:
Add a new record
Update class number
Update scores
Update IQ
Delete old record
Update record status

5 DECISION
Make the decision of passing, failure or retest according to the year
scores.

6 PRTRPT
Perform print out reports:
Student Semester Score Report
Student Year Score Report
Student Semester and Year Score Report
Score Notification
Transcript of Record

7 STANDEVA
Compute mean and standard deviation for every course in one class and
the grade. Predict the average based on IQ and last average. Compare
the predict average to the real average and rank the position with
real average, predict average and error of estimate.
### FILE/PROGRAMS CROSS-REFERENCE

<table>
<thead>
<tr>
<th></th>
<th>CIAMF</th>
<th>GTOORS</th>
<th>GAVPCT</th>
<th>UPATS</th>
<th>DECISION</th>
<th>PROFIT</th>
<th>STADENA</th>
</tr>
</thead>
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<tr>
<td>MISAMP</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SIGAMP</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>RISAMP</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<td>SORTIO</td>
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<tr>
<td>IOSAVE</td>
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<td></td>
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<td></td>
<td></td>
<td>X</td>
</tr>
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<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Most of the programs in this system are multiple used, the best way to get rid of compiling every time is to store the programs in the library. To catalog a program in the permanent core-image library, the OPTION card must specify CATAL instead of LINK, and a PHASE card must follow the OPTION card. Thus the object deck for the program can be stored in the permanent core-image library as follows:

```
// JOB CATALOG EXAMPLE
// OPTION CATAL
    PHASE C1SAMP,*
    INCLUDE
    object deck
/
// EXE LINKEDT
/
```

After the program is cataloged, it can be executed using the PHASE name as follows:

```
// JOB EXECUTE
// EXE C1SAMP
    data deck (if needed)
/
/
```

The processing flowchart is provided on the next pages, user would be recommended to follow the direction to execute the exact program without errors.
GET SCORES (GETSCORES)

ERROR SCORES

UPDATE SCORES (UPDATE)

RANK & CALCULATE (CAGPST)

PRINT SEMESTER REP. (PRTRPT)

CHANGE CLASS #

UPDATE CLASS # (UPDATE)

H2 3.2
PROGRAM USING GUIDE

Every program needs a proper File JCL Card to access the stored data. It also needs an ID Card to execute the program, it may or may not need data cards.

RUN #1 CISAMP

1 File JCL Card
   // DLBL CISAMP,"GSU.GS595D.SHIELD",32/365,ISO
   // EXTENT SYS018,SYS333,4,1,8328,1
   // EXTENT SYS018,SYS333,1,2,8340,12
   // DLBL CISAMP,"GSU.GS595D.SHIELD",0,ISE
   // EXTENT SYS018,SYS333,4,1,8328,1
   // EXTENT SYS018,SYS333,1,2,8340,12

2 Job ID Card
   Col 1-6 Code Value = "J1CID1"
   Col 7-30 Filler

3 Data Card
   Col 1-4 Number
   Col 5 Filler
   Col 6 Class Number
   Col 7-3 Filler

   Occurs 10 times in one card

4 Error Messages
   ERROR : NO ID CARD
   ERROR : WRONG ID CARD
   ERROR : NO STUDENT NUMBER CARD
   ERROR : STUDENT NUMBER NOT NUMERIC
   ERROR : STUDENT NUMBER DUPLICATED

5 Output
   Report: Student Score Master File
1 **File JCL Card**
   // EXEC EDIAP1,SGSU,035950,SEI,01,32/365,ISO
   // JCL1 JCL SY0018,SY0333,4,1,3325,1
   // JCL2 JCL SY0018,SY0333,1,2,3340,12

2 **Job ID Card**
   Col 1-6 Code
   Value "J2CID1"
   Col 7-10 Filler
   Col 11-12 Year
   Col 13-15 Filler
   Col 16 Semester
   Value 1 = Fall
   2 = Spring
   3 = Grad-Test
   Col 17-20 Filler
   Col 21 Grade
   Value 1 = Grade 1
   2 = Grade 2
   3 = Grade 3
   Col 22-25 Filler
   Col 26 Class
   Value 1 = Class 1
   2 = Class 2
   3 = Class 3
   Col 27-30 Filler

3 **Data Card**
   Col 1-14 Number
   Col 5-10 Filler
   Col 11-12 Score
   Col 13-15 Filler
   } Occurs 10 times in one card

4 **Error Messages**
   ERROR : NO ID CARD
   ERROR : WRONG ID CARD
   ERROR : ID CARD NOT NUMERIC
   ERROR : WRONG SEMESTER CODE
   ERROR : NO STUDENT SCORE CARD
   NUMBER ERROR
   SCORE ERROR

5 **Output**
   Report: Student Score Log File
1 File JCL Card
   // DSNAME,'J3SU.G3S595D.SHRE',82/365,ISN
   // EXTENT SYS013,SYS333,4,1,3328,1
   // EXTENT SYS013,SYS333,1,2,3340,12
   // ASGN SYS001,DISK,Vol=SYS333,SR
   // DLRL SORTUK1,0
   // EXTENT SYS013,SYS333,1,0,6316,3
   // DLRL SORTIO,'J3SU.G3S595D.B.SHRE',0,3D
   // EXTENT SYS013,SYS333,1,0,6319,3

2 Job ID Card
   Col  1- 6 Code             Value "J3CID1" = Grade process
                                "J3CID2" = Class process
   Col  7-10 Filler
   Col 11 Grade
   Col 12-15 Filler
   Col 16 Semester         Value 1 = Fall
                                2 = Spring
                                3 = Year
                                4 = Graduate test
                                5 = Graduation
   Col 17-20 Filler
   Col 21 Class            Value 1 = Class 1
                                2 = Class 2
                                3 = Class 3
   Col 22-30 Filler

3 Error Messages
   ERROR : NO CARD ID CARD
   ERROR : WRONG CARD-ID CARD
   ERROR : PRI-END OF SORT-IO-FILE
   JOBS HAVE BEEN PROCESSED

4 Output
   Display: Student Number, Position, Average
1. File JOB Card

// BEGIN RECORD, 'GGSU,GS595D,SHM1', 02/265,115
// BEGIN SY3018,SY3333,4,1,8325,1
// BEGIN SY3018,SY3333,1,2,8340,12
// BEGIN IOCAYL, 'GGSU,GS595D,SHM1', 0, 35
// END SY3018,SY3333,1,0,8325,3

2. Job ID Card

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;J4SID1&quot; = Add a new record</td>
</tr>
<tr>
<td></td>
<td>&quot;J4SID2&quot; = Update class number</td>
</tr>
<tr>
<td></td>
<td>&quot;J4SID3&quot; = Update scores</td>
</tr>
<tr>
<td></td>
<td>&quot;J4SID4&quot; = Update ID</td>
</tr>
<tr>
<td></td>
<td>&quot;J4SID5&quot; = Delete an old record</td>
</tr>
<tr>
<td></td>
<td>&quot;J4SID6&quot; = Update record status</td>
</tr>
</tbody>
</table>

Col 1-6  Code
Col 7-10 Filler
Col 11-12 Number (process cases in one particular job)
Col 13-15 Filler
Col 16  Grade
Col 17-20 Filler

3. Data Card

   a. J4SID1 (add a new record)

   | Col 1-4  Number |
   | Col 5  Filler |
   | Col 6  Grade |
   | Col 7  Filler |
   | Col 8  Semester |
   | Col 9  Filler |
   | Col 10  Filler |
   | Col 11-12  Score \{ Occurs 10 times \ (semester) \} |
   | Col 13-14  Filler |
   | Col 15-16  Position \{ Occurs 2 times \ (year) \} |
   | Col 17-74  Filler \{ Occurs 3 times \} |
b JACIDS (update class number)
Col 1-4 Number
Col 5 Filler
Col 6 Class
Col 7-9 Filler
  
  Occurs 10 times
  
c JACIDS (update scores)
Col 1-4 Number
Col 5 Filler
Col 6 Grade
  Value 1 = Grade 1
  2 = Grade 2
  3 = Grade 3
  4 = Graduate test
Col 7 Filler
Col 8 Semester
Col 9-10 Filler
Col 11-12 Subject Number
Col 13 Filler
Col 14-15 Score
Col 16-17 Filler
  
  Occurs 10 times
  
d JACIDS (update IC)
Col 1-4 Number
Col 5-7 IC
Col 8 Filler
  
  Occurs 10 times
  
e JACIDS (delete an old record)
Col 1-4 Number
Col 5 Filler
Col 51-80 Filler
  
  Occurs 10 times
  
4 Error Messages
ERROR : NO ID CARD
ERROR : WRONG ID CARD
ERROR : NO DATA CARD
ERROR : WRONG NUMBER
ERROR : NUMBER DUPLICATED (KEY)
JOB PROCESS COMPLETE

5 Output
Report: Update Log File
1 File JCL Card
   // FILE (FILE, 'CSSU.CG595G.BH11', S2/365, I313)
   // EXTENT SYS018, SYS333, 4, 1, 8328, 1
   // EXTENT SYS018, SYS333, 1, 2, 8340, 12
   // DILL IOS.LF, 'CSSU.CG595G.BH11', 0, SD
   // EXTENT SYS018, SYS333, 1, 0, 8322, 3

2 Job ID Card
   Col 1-6   Code   Value "J5C11"
   Col 7-10  Filler
   Col 11    Grade  Value 1 = Grade 1
              2 = Grade 2
              3 = Grade 3
              4 = Graduation
   Col 12-30 Filler

3 Error Messages
   ERROR: NO ID CARD
   ERROR: WRONG ID CARD
   ERROR: WRONG NUMBER FOR RISAM-FILE
   ERROR: WRONG NUMBER FOR REWRITE-FILE

4 Output
   Report: Student Rank Report
1. File JCL Card
   // DIEL ASMF, /OCUS/SS5565,SHI,0,IOC
   // EXT SY501,SS333,4,1,3323,3
   // EXT SY501,SS333,1,0,3340,12
   // ASSCH SY5001,DISK,VOI=SY3333,SMR
   // DIEL SORTWK1,56
   // EXT SY5001,SS333,1,0,3319,3
   // DIEL SORTIO2,OCUS/SS5955SHLM13,0,SD
   // EXT SY501,SS333,1,0,3322,3

2. Job ID Card
   Col  1-6  Code  Value "J6CID1" = Grade process score report for semester or year or both
   "J6CID2" = Class process score report for semester or year or both
   "J6CID3" = Grade process score notification for semester or year or both
   "J6CID4" = Class process score notification for semester or year or both
   Col  7-10  Filler
   Col 11-12  Year
   Col 13-15  Filler
   Col 16  Semester  Value 1 = Fall  2 = Spring  3 = Year  4 = Graduate test  5 = Graduation  6 = Fall, Spring and Year
   Col 17-20  Filler
   Col 21  Grade
   Col 22-25  Filler
   Col 26  Class
   Col 27-30  Filler
3.13

Job ID Card 2

<table>
<thead>
<tr>
<th>Col</th>
<th>Code</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6</td>
<td>Code</td>
<td>&quot;J6GID5&quot; = Grade process to print report of transcript of record</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;J6GID6&quot; = Personal process to print report of transcript of record</td>
</tr>
<tr>
<td>7-10</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>11-14</td>
<td>Number</td>
<td></td>
</tr>
<tr>
<td>15-20</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Y1</td>
<td>Value &quot;Y&quot; = Print score of year 1 Fall</td>
</tr>
<tr>
<td>22</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>S1</td>
<td>Value &quot;S&quot; = Print score of year 1 Spring</td>
</tr>
<tr>
<td>24</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Y2</td>
<td>Value &quot;Y&quot; = Print score of year 2 Fall</td>
</tr>
<tr>
<td>26-30</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>P2</td>
<td>Value &quot;P&quot; = Print score of year 2 Fall</td>
</tr>
<tr>
<td>32</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>S2</td>
<td>Value &quot;S&quot; = Print score of year 2 Spring</td>
</tr>
<tr>
<td>34</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Y3</td>
<td>Value &quot;Y&quot; = Print score of year 3 Fall</td>
</tr>
<tr>
<td>36-40</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>P3</td>
<td>Value &quot;P&quot; = Print score of year 3 Fall</td>
</tr>
<tr>
<td>42</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>S3</td>
<td>Value &quot;S&quot; = Print score of year 3 Spring</td>
</tr>
<tr>
<td>44</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Y3</td>
<td>Value &quot;Y&quot; = Print score of year 3 Fall</td>
</tr>
<tr>
<td>46-50</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>CT</td>
<td>Value &quot;C&quot; = Print score of Graduate Test</td>
</tr>
<tr>
<td>52-55</td>
<td>Filler</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>GD</td>
<td>Value &quot;G&quot; = Print score of Graduation</td>
</tr>
<tr>
<td>57-60</td>
<td>Filler</td>
<td></td>
</tr>
</tbody>
</table>

4. Error Messages

<table>
<thead>
<tr>
<th>ERROR</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERROR</td>
<td>NO ID CARD</td>
</tr>
<tr>
<td>ERROR</td>
<td>WRONG ID CARD</td>
</tr>
<tr>
<td>ERROR</td>
<td>ID CARD NOT NUMERIC</td>
</tr>
<tr>
<td>ERROR</td>
<td>WRONG CODE IN ID CARD</td>
</tr>
</tbody>
</table>
5 Output

Report:  Student Semester Score Report
         Student Year Score Report
         Student Semester and Year Report
         Score Notification
         Transcript of Record
1 File JCL Card
   // EXEC INCLUDE,'CCSU.CS595D.SHELI',32/365,151
   // EXEC SYSDISP,SYSDISP3,4,1,8349,1
   // EXEC SYSDISP,SYSDISP3,1,2,8349,12
   // ASSIGN SYSPRINT,DISK,Vol=SYS333,SHR
   // END EXEC
   // EXEC SYSDISP,SYSDISP3,1,0,8316,3

2 Job ID Card
   Col 1-6   Code                        Value "J7CID1"
   Col 7-10  Filler
   Col 11    Grade
   Col 12-15 Filler
   Col 16-17 Year of Fall
   Col 18-20 Filler
   Col 21-22 Year of Spring
   Col 23-30 Filler

3 Error Messages
   ERROR : NO ID CARD
   ERROR : WRONG ID CODE
   ERROR : PRC. EOF

4 Output
   Report: Score Statistical Analysis Report
   a. Mean and Standard Deviation
   b. Correlation and Prediction
   c. Summary
REMARKS

These programs have been tested many times, and no problems were encountered. Most common problems were:

1. Use wrong File JCL Card
2. No Job ID Card
3. Wrong Job ID Card
4. Input scores are not numeric
5. Input number is not numeric
6. Use wrong number as search key
7. Input data (scores and numbers) from cards in wrong column