APPENDIX

APPENDIX:DATA STRUCTURE AND PROGRAM USING

A. Data structure

The raw data for the information form are provided by Planning Division, PSU. This file is called stu36.xls and consists of 6 columns (coded the data for each page of information form) and as follows records

ID	S1	S2	S3	S4	S5	S6
3615001	2342501321112901181830941	11661111479468	5111 94272	26 112	119423012	2
3615002	2142501341110405181890911	12331111439071	81114490618	14 11	119020011	1
3615003	2342501321112312171894941	62221111549415	31114094153	14 114	219422211	1
3615006	234250 11106091719808019	64631111598015	41115380154	14 11	218026411	1
3615007	2142501321111212171992811	64523111469215	3111 941	24 11	218120012	2
3615009	2342501341113103181890901	63321111549018	61114790154	144114	119019011	1

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Then we separated each column by using Access. The new data set is called realdata mdb and consists of identification, gender, age group, religion, family status, family income, father's education, father's occupation, mother's education, mother' occupation, method of entrance, entrance score, school, residence, school GPA, faculty, and basic education.

3615001	3	1	1	1	2	2	4	1	4	1	0	1	2	15	1
3615002	1	1	1	1	2	2	1	2	1	1	0	1	2	15	1
3615003	3	1	1	1	1	1	3	1	3	2	0	1	2	15	1
3615006	3	2	1	1	2	1	3	1	3	2	0	1	2	15	1
3615007	1	2	1	2	1	1	3	2	3	2	0	1	2	15	1
3615009	3	1	1	1	2	1	4	1	3	1	0	1	1	15	1

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The university entrance examination score and the university grade point average after 4 years are provided by the Education Services Division, Prince of Songkhla University, Pattani Campus. The university entrance examination score file is called score.mdb and consists of columns (identification, score, faculty, and method of entrance), as follows

3615001	2	15	1
3615002	2	15	1
3615003	3	15	2
3615006	3	15	2
3615007	3	15	2
3615009	2	15	1

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The university grade point average after 4 years file is call gpa.mdb. And consists of 3 columns (identification, status, and university grade point average), as follows

3615001	5	2.45
3615002	5	2.21
3615003	5	2.79
3615006	5	2.96
3615007	5	2.81
3615009	5	2.53

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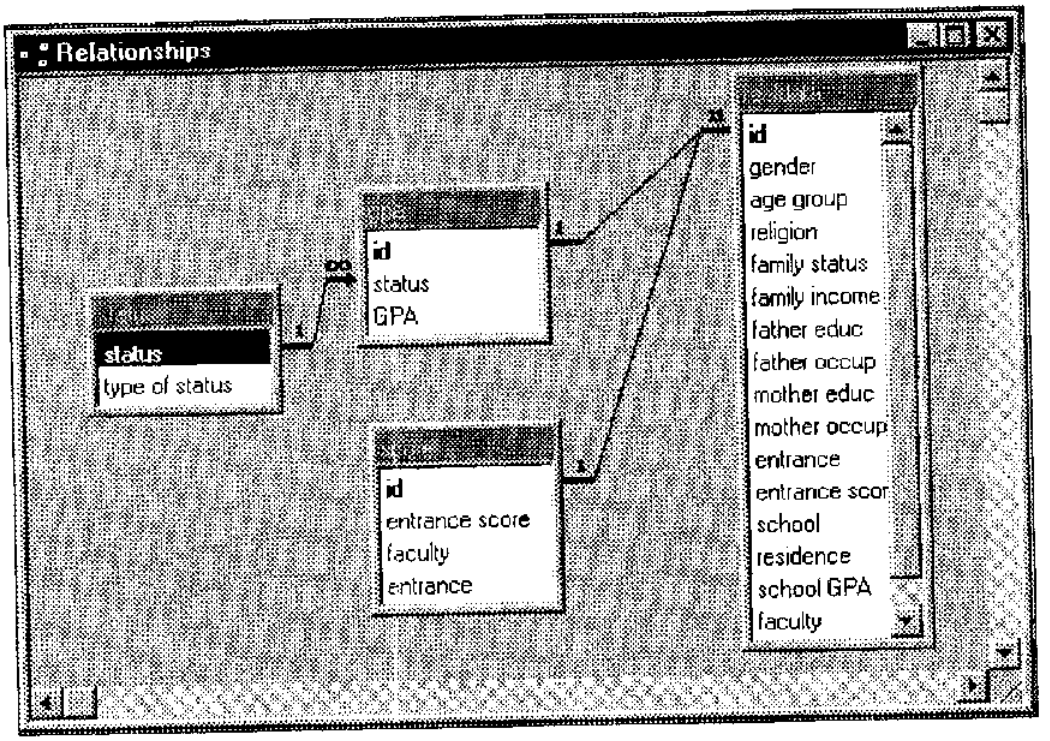
The file in Access is called data.mdb and consists of the relation set for 4 tables (realdata.mdb, score.mdb, gpa.mdb, and status.mdb). The status file consists of 2 column (status code and status)

1	No registered
2	Died
3	Expelled
4	Absent
5	Normal

The relation set show as follows.



The datafile is call dataset.mdb created by queries. These comprises columns and 627 records. This SQL command listing and data structure as follows.

```
SELECT realdata.id, realdata.gender, realdata.[age group],
        realdata.religion, realdata.[family status], realdata.[family income],
        realdata.[father educ], realdata.[father occup], realdata.[mother educ],
        realdata.[mother occup], realdata.entrance, realdata.[entrance score],
        realdata.school, realdata.residence, realdata.[school GPA],
        realdata.faculty, realdata.[basic educ], gpa.GPA, status.status
FROM status LEFT JOIN (score INNER JOIN (realdata INNER JOIN gpa
        ON realdata.id = gpa.id) ON (gpa.id = score.id) AND (score.id =
        realdata.id)) ON status.status = gpa.status
WHERE (((status.status)="5"));
```

The data structure

3615001	3	1	1	1	2	2	4	1	4	1	2	0	1	2	15	1	2.45
3615002	1	1	1	1	2	2	1	2	1	1	2	0	1	2	15	1	2.21
3615003	3	1	1	1	1	1	3	1	3	2	3	0	1	2	15	1	2.79
3615006	3	2	1	1	2	1	3	1	3	2	3	0	1	2	15	1	2.96
3615007	1	2	1	2	1	1	3	2	3	2	3	0	1	2	15	1	2.81
3615009	3	1	1	1	2	1	4	1	3	1	2	0	1	1	15	1	2.53

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B. Grapling Box plots

The histogram for each variable and transformed achievement using the ASP (McNeil et al, 1997) package in MATLAB version 4 (Hanselman et al, 1995), the following program is used.

```
system_dependent(14,'on')
getfile regdata.num
%delete id column
y=getnum;
data=y(:,2:18);
putnum(data);
describe hist=1
describe hist=1 font=9
%transformation achievement
getfile regdata.num
y=getnum;
lo=y(:,18);
lo=log2(lo);
y(:,19)=lo;
putnum(y),
fn=getfn;
```

```
fn=str2mat(fn,'log2(GPA)');
putfn(fn)
delete id column
y=getnum;
data=y(:,18:19);
putnum(data);
fn=getfn ('cl=1');
fn=getfn ('cl=0');
fn=str2mat('GPA','log2(GPA)');
putfn(fn);
describe hist=1
```

The box plots and 95% confidence intervals used to show the relation between achievement and gender, the following program is used.

```
system_dependent(14,'on')
getfile regdata.num
%delete id column
y=getnum;
data=y(:,2:18);
putnum(data);
describe hist=1
%univariate for each variables
%stratification variables
setvar y=17 x=1
compare type=3
hold on
title(' ')
%track function
setvar y=17 'x=14 2 1'
stratify
```

```
track res=1
title(' ')
ylabel('achievement')
setvar y=17 'x=14 10 12'
stratify
track res=1 new=0
title(' ')
ylabel('achievement')
```

The box plots for achievement and age group using a straightforward modification of this program. This modification involves replaces each occurrence of

```
setvar y=17 x=1
```

by

```
setvar y=17 x=2
```

Finally, the multiple regression model may be used to estimated parameters in the model are statistically significant and whether the statistical assumptions underlying the model are plausible for the data, the following program.

```
system_dependent(14,'on')
getfile regdata.num
%transformation achievement
y=getnum;
lo=y(:,18);
lo=log2(lo);
y(:,19)=lo;
putnum(y);
fn=getfn;
fn=str2mat(fn,'log2(gpa)');
putfn(fn)
%delete id column
```

```
y=getnum;
data=y(:,2:19);
putnum(data);
%regression analysis
setvar y=17 'x=1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16'
adjust show=1 font=9
setvar y=17 'x=1 2  4 10 12 14 15 '
adjust show=1 font=9
%reduced model & combined catagorical
y=getnum;
fam=y(:,4);
int=(fam~=1);
y(:,16)=int;
putnum(y)
y=getnum;
y=[y int];
putnum(y)
fn=getfn;
fn=str2mat(fn,'family status');
putfn(fn)
y(:,20)=int;
putnum(y)
[lab,colid]=getlab;
lab=str2mat(lab,'20,0 couple,1 separated');
colid=[colid;20];
putlab(lab,colid)
describe hist=1
%adjust interection between sex and age group
y=getnum;
sex=y(:,1);
age=y(:,2);
```

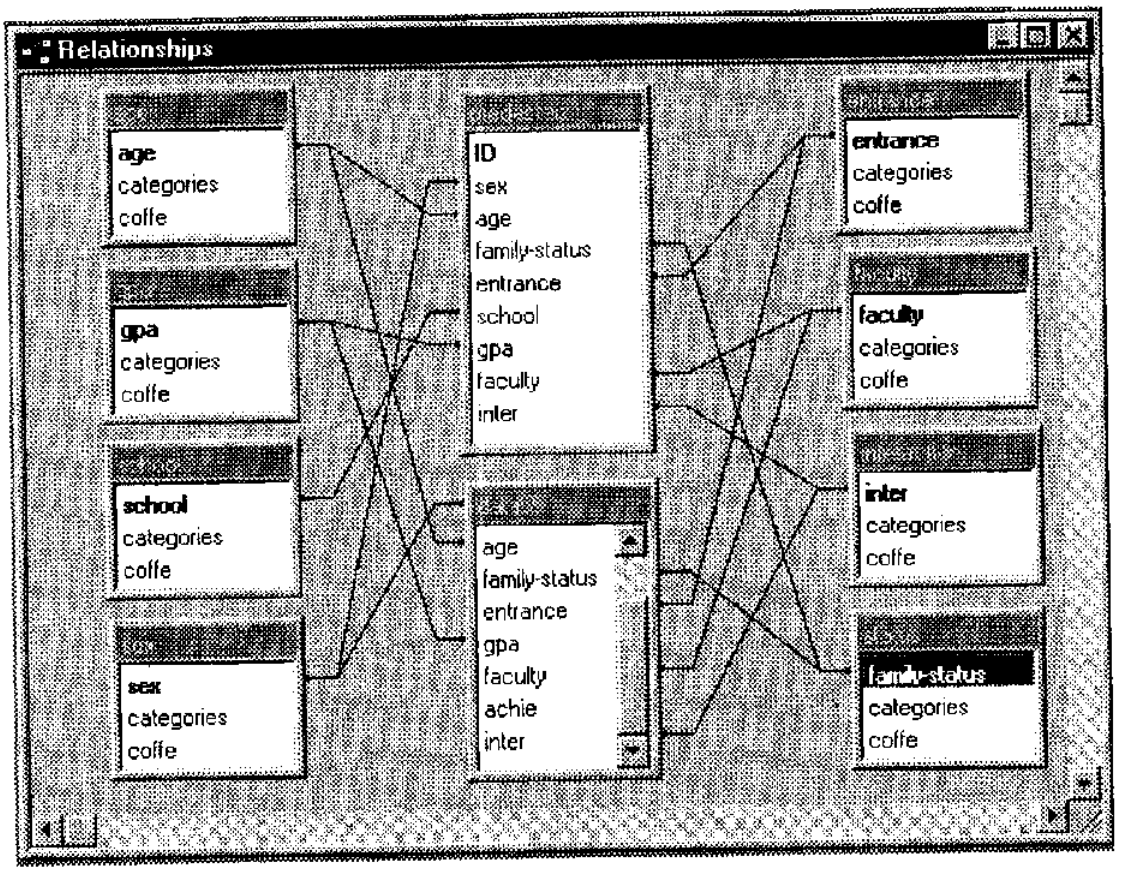
```
sexage=scx.*age;
y(:,16)=sexage;
putnum(y)
y=getnum;
y=[y sexage];
putnum(y)
fn=getfn;
fn=str2mat(fn,'gender.age group');
putfn(fn)
int = (sex>1) &(age>0);
sexage1 -sexage.*int;
y(.,21)=sexage1;
putnum(y)
[lab,colid]=getlab;
lab=str2mat(lab,'21,0 0,1 female*18,2 female*19,3  female*20+');
colid=[colid;21];
putlab(lab,colid)
setvar y=17 'x=1 2  4 10 12 14 15 21'
adjust show=1 font=9
describe
setvar y=17 'x=1 2  4 10 14 15 21'
adjust
% y=getnum
% fam=y(:,4);
% int=y(:,4)>1
%y(:,4)=int
%putnum(y);
%[lab,colid]=getlab;
%lab=str2mat(lab,'4,0 couple,1 separated');
%colid=[colid;4];
%putlab(lab,colid);
```

```
%confounding
setvar y=17 'x=1 20 10 14 15'
adjust
setvar y=17 'x=20 10 14 15'
adjust
setvar y=17 'x=1  10 14 15'
adjust
setvar y=17 'x=1 20 14 15'
adjust
setvar y=17 'x=1 20 10  15'
adjust
%8 categoricals of interaction term
system_dependent(14,'on')
getfile reg2 num
y = getnum;
y(y(:,5)==3,5) = 2+0*y(y(:,5)==3,5);
z = y(:,3);
z(y(:,3)==1) = 0*z(y(:,3)==1);
z(y(:,3)==0) = 1+0*z(y(:,3)==0);
z = 10*(2-y(:,2))+z;
y = [y z];
putnum(y)
fn = getfn;
fn = str2mat(fn,'gender*age');
putfn(fn)
[lab,colid] = getlab;
lab = str2mat(lab,'19,0 g18,1 g16-17,2 g19,3 g20+,10 m18,11 m16-17,12
m19,13 m20+');
colid = [colid ; 19];
putlab(lab,colid)
describe hist=1
```

```
setvar y=18 'x=5 11 15 16 19'
adjust font=10
```

We calculated predicted score for each student by using Access. The relation set of dataset and coefficient table for each predictor variables shows as follow.

Relationship:



The next step, we use SQL command to created file predicted score. This file is call predict. And consists of 9 columns (identification, gender, age group, family status, entrance, shool GPA, faculty, GPA, and predicted score) and 627 records The SQL command shows as follows.

```
SELECT DISTINCTROW data55.id, data55.sex, data55.age, data55.[family-status], data55.entrance,
        data55.gpa, data55.faculty, data55.achie, 2.42+[sex].[coffe]+[age].[coffe]+[status].[coffe]+
        [entrance].[coffe]+[gpa].[coffe]+[faculty].[coffe]+[interaction].[coffe] AS predictachieve
FROM status INNER JOIN (sex INNER JOIN (interaction INNER JOIN (gpa INNER JOIN (faculty
INNER JOIN (entrance INNER JOIN (age INNER JOIN data55 ON age.age = data55.age) ON
        entrance.entrance = data55.entrance) ON faculty.faculty = data55.faculty) ON gpa.gpa =
        data55.gpa) ON interaction.inter = data55.inter) ON sex.sex = data55.sex) ON status.[family-
        status] = data55.[family-status]
ORDER BY data55.id;
```

The data shows as follows:

```
3615001  2  1  1  1  2  15  2.45  2.63
3615002  1  1  1  1  2  15  2.21  2.52
3615003  2  1  1  2  2  15  2.79  2.79
3615006  2  2  1  2  2  15  2.96  2.70
3615007  1  2  2  2  2  15  2.81  2.55
3615009  2  1  1  1  1  15  2.53  2.53
.....
.....
```

The plots of actual score against predicted score, shows

```
system  dependent(14,'on')
getfile predict.num
describe hist=1 new=0
%transformation achievement
y=getnum;
lo=y(:,7);
lo=log2(lo);
y(:,8)=lo;
putnum(y);
fn  getfn;
```

```
fn=str2mat(fn,'log2(achieve.)');
putfn(fn)
delete id column
y=getnum;
data=y(:,7:8);
putnum(data);
fn=getfn ('cl=1');
fn=getfn ('cl=0');
fn=str2mat('achievement','log2(achieve.)');
putfn(fn);
describe hist=1
getfile predict.num
y=getnum;
lo=y(:,7);
lo=log2(lo);
y(:,8)=lo;
putnum(y);
fn=getfn;
fn=str2mat(fn,'log2(achieve.)'),
putfn(fn)
setvar y=7 'x=5 2 1'
stratify
track res=1
ylabel('achievement')
```

The plots of actual score and predicted score used command as follows.

```
system_dependent(14,'on')
getfile raw_pre.num
relate line=1  'col=8 9'
```

ID

insert photograph 2x3cm

Application Form
Prince of Songkla University

Please ensure all questions are answered correctly by writing clearly in the lines provided or by placing a X in the appropriate space. If a code number is required please refer to the handbook provided for an explanation.

Questions 1-29 and question 45 ***must*** be answered.

1. PSU (1) Hat Yai campus (2) Pattani campus (3) Phuket (4) Surat Thani (5) Trang

2. Name (1) Mr. (2) Mrs. (3) Miss _____ Surname _____
(firstname)

3. Level of Entry Desired (1) PhD (2) Masters (3) Diploma (4) Bachelor degree (4-6 yrs)
(5) Bachelor degree (1-2 yrs) (6) Other less than Bachelor degree
(7) Other *(specify)* _____

4. Faculty / College _____ *(see p 2 of handbook)*

Subject Major _____ *(see pp 3-7 of handbook)*

5. Citizenship (1) Thai (2) Chinese (3) Other _____

6. Nationality (1) Thai (2) Chinese (3) Other _____

7. Religion (1) Buddhism (2) Islam (3) Christian (4) Other _____

8. National Identification Number (social security) _____ House number _____

Street _____ Village section number _____ Town _____

District _____ Province _____ Post code _____ Tel _____

9. Date of birth: Day _____ Month _____ Year _____ *(please use leading zeros)*

Age _____ yrs Place of birth: District _____ Province _____
(see pp 8-10 of handbook)

Province which you have spent most of your life _____

10. Marital Status (1) Single (2) Married (3) Separated (4) Widow

Name of Spouse *(if applicable)* _____

11. Place of residence during study (1) Mother and Father (2) Father only (3) Mother only
(4) Other relatives (5) Private dorm. (6) Uni. dorm.
(7) Renting privately (8) Temple (9) Other *(specify)*

12. Ranking in family _____ *(if more than nine use 9)*

Number of brothers and sisters still alive *(include yourself)* _____

Number of brothers and sisters still studying *(include yourself)* _____

13. Current status of parents (1) Living together (2) Father deceased (3) Mother deceased
(4) Both deceased (5) Separated due to work commitments
(6) Separated due to other reasons (7) Divorced

14. Father's Name _____ Surname _____

Citizenship (1) Thai (2) Chinese (3) Other *(specify)* _____

Nationality (1) Thai (2) Chinese (3) Other *(specify)* _____

Religion (1) Buddhism (2) Islam (3) Christian (4) Other *(specify)* _____

If father deceased go on to question 15.

Age _____ yrs House number _____ Street _____ Village number _____

Town _____ District _____ Province _____ ☐☐

(see pp 8-10 of handbook)

Post code _____ Tel _____ _____

15. Highest level of education (1) Primary (2) Secondary/High school (3) Tertiary / university
(4) College (5) Certificate from uni (1-2 yrs)
(6) Bachelor degree (4-6 yrs) (7) Masters degree (8) PhD
(9) No qualifications (0) Other *(specify)* _____

16. Father's occupation (1) Government official (2) Government official + State Enterprise
(3) Company employee (4) Agriculture (5) Self-employed
(6) Labourer (7) Unemployed (8) Other _____

Place of work _____ Position _____

For questions 15 and 16 if father deceased use father's occupation prior to death.

17. Father's income - baht per month. *(If two incomes use combined average)*

(1) Deceased (2) Currently unemployed (3) < 3,000 (4) 3,001 - 5,000
(5) 5,001 - 7,000 (6) 7,001 - 9,000 (7) 9,001 - 11,000 (8) 11,001 - 13,000
(9) 13,001 - 15,000 (0) Other _____ *(specify)*

18. Mother's Name _____ Surname _____

Citizenship (1) Thai (2) Chinese (3) Other *(specify)* _____
Nationality (1) Thai (2) Chinese (3) Other *(specify)* _____
Religion (1) Buddhism (2) Islam (3) Christian (4) Other *(specify)* _____

If mother deceased go on to question 15.

Age _____ yrs House number _____ Street _____ Village number _____

Town _____ District _____ Province _____ ☐☐
(see pp 8-10 of handbook)

Post code _____ Tel _____

19. Highest level of education (1) Primary (2) Secondary/High school (3) Tertiary / university
(4) College (5) Certificate from uni (1-2 yrs)
(6) Bachelor degree (4-6 yrs) (7) Masters degree (8) PhD
(9) No qualifications (0) Other *(specify)* _____

20. Mother's occupation (1) Government official (2) Government official + State Enterprise
(3) Company employee (4) Agriculture (5) Self-employed
(6) Labourer (7) Unemployed (8) Other _____

Place of work _____ _____ Position _____

For questions 15 and 16 if father deceased use mother's occupation prior to death.

21. Mother's income - baht per month. *(If two incomes use combined average)*

(1) Deceased (2) Currently unemployed (3) ≤ 3,000 (4) 3,001 - 5,000
(5) 5,001 - 7,000 (6) 7,001 - 9,000 (7) 9,001 - 11,000 (8) 11,001 - 13,000
(9) 13,001 - 15,000 (0) Other _____ *(specify)*

22. Major source of financial support (1) Mother and Father (2) Father only (3) Mother only
(4) Guardian (5) Benefactor (6) Other relative
(7) Self (8) Scholarship (9) Bank loan
(0) Spouse

23. Predicted Living Expenses (excluding university fees)

(1) 500 baht or less (2) 501 - 700 (3) 701 - 900 (4) 901 - 1,100
(5) 1,101 - 1,300 (6) 1,301 - 1,500 (7) 1,501 - 1,700 (8) 1,701 - 1,900
(9) 1,901 - 2,100 (0) more than 2,100 _____ *(specify)*

24. If working, monthly income, in baht *(skip if not employed)*

(1) 500 baht or less (2) 501 - 700 (3) 701 - 900 (4) 901 - 1,100
(5) 1,101 - 1,300 (6) 1,301 - 1,500 (7) 1,501 - 1,700 (8) 1,701 - 1,900
(9) 1,901 - 2,100 (0) more than 2,100 _____ *(specify)*

25. Allergies (1) No (2) Yes *(specify)* _____

26. Chronic Disease (1) No (2) Yes *(specify)* _____

27. Blood Group (1) A (2) B (3) AB (4) O

28. If completed any subject in the armed forces, which year _____

29 Identification documents for this application

(1) Graduation certificate (4) This application form only
(2) Household registration papers (5) Doctor's certificate
(3) Photograph (6) Other
_____

Questions 30-32 and question 45 should be completed by studetns who have undertaken Bachelor degrees for 1-2 years, certificate, masters or higher degree

30. Highest degree before entering university _____

Major _____ Institute _____

Country _____ Year completed _____

31. Monthly income, in baht *(skip if not currently employed)*

(1) less than 2,000 (2) 2,001 - 3,000 etc...

32. Name of employer _____

District _____ Province _____ ☐☐ *(see pp 8-10 of handbook)*

Position _____

Questions 33-45 should only be completed if you have completed a Bachelor degree (4-6 years)

33. How entered
(1) First entrance exam (national)
(2) Second entrance exam (local)
(3) Quota Ministry of Interior *no.* _____
(4) Quota Center of Southern Provinces Administration *no.* _____
(5) Other *(specify)* _____

34. Where did you finish your last degree before entering this university?

(1) School (2) Institute / College
(3) In-formal school
(4) Other _____

Name of school / Institute / College _____

Year completed _____ District _____ Province _____ ☐☐
(see pp 8-10 of handbook)

35. Major subject
(1) Science (2) Liberal Arts / Language (3) Mathematics
(4) Business (5) Home economics (6) Industry
(7) Works of Art (8) Physical Ed. (9) Agriculture
(0) Other _____

Source of sponsorship (1) Mother and Father (2) Father only
(3) Mother only (4) Neither

If sponsor is either father amd/or mother, skip questions 36-38

36. Sponsor...
Name of sponsor during study _____ Surname _____ Age ____

Citizenship (1) Thai (2) Chinese (3) Other *(specify)* _____
Nationality (1) Thai (2) Chinese (3) Other *(specify)* _____
Religion (1) Buddhism (2) Islam (3) Christian (4) Other *(specify)* _____

House number _____ Street _____ Village number _____

Town _____ District _____ Province _____ ☐☐
(see pp 8-10 of handbook)

Post code _____ Tel _____

Relationship with student/applicant _____

37. Highest level of education (1) Primary (2) Secondary/High school (3) Tertiary / university
(4) College (5) Certificate from uni (1-2 yrs)
(6) Bachelor degree (4-6 yrs) (7) Masters degree (8) PhD
(9) No qualifications (0) Other *(specify)* _____

38. Occupation (1) Government official (2) Government official + State Enterprise
(3) Company employee (4) Agriculture (5) Self-employed
(6) Labourer (7) Unemployed (8) Other _____

Place of work _____ Position _____

39. Income etc.

40. Guardian of student/applicant (1) Mother and Father (2) Father only (3) Mother only
(4) Sponsor (5) Other _____

41. Name of Guardian _____ Surname _____ Age ____

Citizenship (1) Thai (2) Chinese (3) Other *(specify)* _____
Nationality (1) Thai (2) Chinese (3) Other *(specify)* _____
Religion (1) Buddhism(2) Islam (3) Christian (4) Other *(specify)* _____

House number _____ Street _____ Village number _____

Town _____ District _____ Province _____ ☐☐
ee pp 8-10 of handbook)

Post code _____ Tel _____

Relationship with student/applicant _____

42. Highest level of education (1) Primary (2) Secondary/High school (3) Tertiary / university
(4) College (5) Certificate from uni (1-2 yrs)
(6) Bachelor degree (4-6 yrs) (7) Masters degree (8) PhD
(9) No qualifications (0) Other *(specify)* _____

43. Occupation (1) Government official (2) Government official + State Enterprise
(3) Company employee (4) Agriculture (5) Self-employed
(6) Labourer (7) Unemployed (8) Other _____

Place of work _____ Position _____

44. Guardian Income (1) No income (2) 3,000 or less (3) 3,001 - 5,000
(4) 5,001 - 7,000 (5) 7,001 - 9,000 (6) 9,001 - 11,000
(7) 11,001 - 13,000 (8) 13,001 - 15,000 (0) more than 10,000

I declare that while I am studying at PSU my name is not currently contained in the records of another institute in Thailand. I intend to study to the best of my ability following the rules set down by the university and I will preserve the good manners of previous students of the university to the utmost. I understand that the university supports the students' respect towards elders but I will not support any intimidation of new students by their elders. I will abide by this rule. If found breaking this rule or if my manners are not in keeping with university policy then I will accept whatever punishment is given to me. All the information given in this application is correct.

Signature of applicant_____ _____

Signature of witness _____ *(Father or guardian)*

Date ____/___/_____