
STUDENT TEST MARKING PROGRAM

Information Technology Services

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Section 1 Introduction

The information contained in this manual relates mainly to the use of scanner sheets with the Student Test Marking Program. The Student Test Marking Program is a facility provided by Information Technology Services. It is capable of marking an objective test based on information provided by an instructor, by comparing a student's answer against the one set by the instructor.

The instructor gives the students a test. The students enter their responses on answer sheets provided. The instructor then submits these student answer sheets, as well as a "master" answer sheet to Enterprise Technology Services. The information on the sheets is processed through the Student Test Marking Program.

There are nine reports generated by the Student Test Marking Program. They are as follows:

1. Student Analysis by Name vs Question Number
2. Student Analysis by Score vs Question Number
3. Student Analysis by Id vs Question Number
4. Analysis of Test (General Test Statistics)
5. Distribution of Scores
6. Success Coefficient Report
7. Discrimination Index Report by Index
8. Discrimination Index Report by Question
9. Distractor Preference Graph

The information from these reports provide the instructor with the score for each student; the mean, median and mode statistics; a "Bell Curve"; and the ability to analyze the fairness of any question in the test.

Questions on the use of this facility should be directed to the I.T. Support Centre NX210 or x8888.

Section 2 Guidelines

The following guidelines are applicable when using scanner sheets with the Student Test Marking Program.

1. We strongly suggest you fill in and bubble the faculty name and test name on the answer sheet.
2. There can be only **ONE ANSWER** for each question in a test. This answer can be a single digit number (1-5) or an alphabetic letter (A-E) or blank. True/False questions can be handled by using coded responses of 1/2 or A/B.
3. A blank response on the instructor answer sheet will be interpreted as a question that does not exist and will not be included in any calculations. A student response will not be printed for this question. Some instructors use blank questions to separate groups of questions (eg 1-10 then 12-21 or 1-10 then 21-30)
4. The program can handle up to a maximum of 150 questions and any number of students in any test.
5. Scanned data will be saved for a minimum period of 60 days. After 60 days, it may be removed from the system.
6. If you require your data to be re-run, you may resubmit the sheets for scanning. If you no longer have the sheets, contact I.T. Support Centre and they will advise you if your data is still on the system. Please supply the date the test was originally scanned and the Test Name.
7. After processing the tests for a group of classes, instructors may aggregate student response sheets for multiple class sections under a single instructor answer sheet to get overall group picture and set of stats.

Section 3 Scanner Forms

A. *Availability*

Divisions may have the PrintShop produce the “Student/Faculty Answer Sheet” in bulk to distribute or faculty may print their own from the PDF. It can be found on the web site <http://humber.ca/staff/its>. The form must be printed actual size and duplexed.

B. *Completing the Student/Faculty Answer Sheet*

The Student/Faculty Answer Sheet is used by BOTH the instructor and the students.

Faculty Answer Sheet

The INSTRUCTOR enters on their sheet the correct answers. The INSTRUCTOR must fill in their name and the TEST NAME. Instructor or test names that are not filled in will display on the reports as ‘(blank)’ (i.e. the bracketed word ‘blank’)

The box area of the form entitled "FOR FACULTY USE ONLY" must be completed as follows:

FACULTY ANSWER SHEET: Blacken the to indicate "YES" this is the Instructor's answer sheet.

FACULTY WEIGHT SHEET: If weighting is required a separate sheet must be used with the blackened and the weighting amounts on the reverse side. For more information please see “Section C” below.

ALPHABETIC ANSWERS: Blacken the to indicate "YES"; the answers are to be recorded as alphabetic (A-E). Blacken the to indicate "NO"; the answers are not alphabetic and that they are to be recorded as numeric (1-5). If not marked, numeric responses will be assumed. Whether marked or not, the student responses will be marked in the same mode as the instructor answers. This selection primarily affects the presentation of the output reports (i.e. shows results with characters A-E or 1-5).

Student Answer Sheet

The STUDENT enters their Student Name, Identification Number, Test Name and their answers on the answer sheet. Each student name should be unique. If there is more than one student with the same last name a first initial should be added (i.e. Smith D / Smith K) Non-unique names or IDs will not cause program problems Blank names or IDs

will be replaced with a serialized 'Unknown' place holder. (e.g. Unknown001 for name / Unkn-0001 for ID). Unknown sequencing is based on the order the sheets are read into the scanner and may not appear in ascending order in the name or ID sorted reports. For the name sorted report, any Unknown names will be at the very end. For the ID sorted report, any Unkn IDs will be at the very end.

NOTE: Please ensure a student has not marked anything in the section
"FOR FACULTY USE ONLY"

C. *Faculty Answer Sheet - Weighting*

The weighting is used by the INSTRUCTOR to request additional information in processing the test. One sheet is required to be filled out for obtaining weighting.

For every correct answer, the weight for the question is added to the total score. For very wrong answer the weight is not taken into account. A Weighting value may range from 1-5. A blank answer on the instructor answer sheet will have a weight of "0" and will not be included in calculations (i.e. it is ignored). All other answers will have a weight of "1" assigned if not marked.

If there are more values marked for weight on the Student/Faculty Answer Sheet than there are questions used in the test, then the additional values will not be included in calculations.

D. *General Rules for using the Scanner Sheets*

1. Do not make stray marks on the forms. Do not write across any oval position as it will be interpreted by the scanner and may distort results.
2. Blacken the ovals completely.
3. Erase errors completely.
4. Where more than one response is blackened for a question, the scanner will attempt to determine the darkest mark. For student responses, if a darkest mark cannot be determined then a '*' will be used and displayed on the reports and will be considered to be wrong.
5. An instructor's Answer Sheet may be used more than once if it is in good condition (i.e. not torn or folded). However, after four times of scanning it is requested that this sheet be replaced.
6. Do not staple or punch any holes in the sheet.

Section 4 Submitting Sheets for Scanning

1. The only acceptable sheets for scanning are the Student/Faculty Answer Sheet or Multi-Purpose Faculty Answer Sheets. Original forms only. **No photocopies.** Photocopies are frequently not the EXACT same scaling size as the originals.
2. An instructor's answer sheet must be the **first sheet** submitted for each test. Ensure that this is the correct master answer sheet for the test.
3. Ensure that all details in the shaded area "FOR FACULTY USE ONLY" have been filled in on the Instructor's Answer Sheet.
4. Verify that the student answer sheets DO NOT contain any marks in the shaded area "FOR FACULTY USE ONLY". A student who enters a 'Y' for 'Faculty Answer Sheet' will cause the student sheet to be considered the start of a new test set (i.e. the sheet will be considered to be an instructor answer sheet). A student who fills in 'Y' or 'N' for 'Alphabetic Answers' will not cause a problem. The 'Alphabetic Answer' is only read from the Instructor sheet.
5. Ensure that students with the same surname uniquely identify their sheets. The name **must** be bubbled in. Non-Unique names or IDs will not cause reporting problems. Blank names will be replaced with an Unknown designation (e.g. Unknown001). Blank IDs will be replaced with an Unkn- designation (e.g. Unkn-0001).
6. The Test Name and Instructor name must be written and **bubbled** in on the answer sheet. Please fill in the divisional number in the space where the STUDENT ID NUMBER is bubbled in. Students entered test names are ignored by the system. Differences with the instructor supplied test name will not cause any problems.
7. Submit forms for scanning to Room E217, (through E218). Data Control or operator on duty will scan the sheets. Tests are scanned at 11:00 am, 1:30 pm, and 3:30 pm. Any tests that arrive after 3:30 pm will be scanned through the evening and available in the morning for pickup.
8. When submitting tests through inter-office mail, please include your Name, Department and Extension number on the Instructor's answer sheet at the top of the sheet so that the sheets and test results can be returned to you. Mail your test to Data Control, Enterprise Technology Services.

Section 5 Explanation of Reports

Each completed test run consists of 9 reports. The following is an explanation of the reports and the information that can be obtained from them. The TEST and INSTRUCTOR NAMES as filled in on the instructor's answer sheet, is printed at the top left of every page. Blank Test or Instructor names are presented as '(blank)'. The date and time that the report was generated are printed at the top right

Student Analysis by Name vs. Question Number - Report #1

The student answers are compared against the answers provided by the instructor. Any answer that does not match the instructor's answer for a question is considered wrong. Correct student answers are reported as blanks (" "). Incorrect student answers are reported as submitted. Blank student answers are reported as periods (".") when blank is an incorrect answer. When a student gives more than one answer for a question and the darkest mark cannot be determined, an asterisk ("*") will be reported and also counted as wrong.

Along the top of the report are the question numbers. Immediately below, is a line indicating, the correct answers as supplied by the instructor. If the instructor's answer for a question is blank (i.e. unused) then this will show as " " in the correct answer line. If there has been additional information supplied by the instructor (weighting), those values are printed on the next available lines with appropriate headings. If the answer is blank then any supplied weighting for that question will also show as blank and not affect anything.

Along the left hand side of the report is the student name and student id number, as filled in by the student on his answer sheet. Blank student names on answer sheets will show as Unknown001, Unknown002, etc. on the report. Blank student IDs on answer sheets will show as Unkn-0001, Unkn-0002, etc. on the report. A single sequence series is used and shared between the names and IDs as applicable. This report is sequenced by Student name. Beside the student name and number is the actual score attained by the student and the score as a percentage. The SCORE of a test is the sum of the weights of the questions. A student's score is the sum of the weights of his correct answers. If no Student/Faculty Answer Sheet for WEIGHT is submitted, each question is worth ONE mark. If a sheet for WEIGHT is submitted, each question's worth is the value as submitted on the sheet.

Student Analysis by Score vs. Question Number - Report #2

Same as: Report #1. Students are ordered by score.

Student Analysis by Id vs. Question Number - Report #3

Same as: Report #1. Students are ordered by Student Id Number.

Analysis of Test - Report #4

This report shows the statistical information concerning the overall performance of the students. The statistics are as follows:

Maximum Available Score		-- sum of all the weights (value of the questions)
Mean		-- sum of the scores divided by number of students
Median		-- score held by the middle student
Mode		-- most frequently occurring score(s)
Standard Deviation		-- measure of the variability of scores
Mean Deviation		-- measure of the average variability
Range of Scores		-- lowest score to highest score
Total Students		-- number of student answer sheets scanned
Class Average		-- mean expressed as a percentage
4 ABOVE/EQUAL TO 85%		-- no. of scores - 85% - 100% or no. of grades of 4 in the 0-4 Grading System
3 ABOVE/EQUAL TO 75%		-- no. of scores between 75% - 84.99% or no. of grades of 3 in the 0-4 Grading System
2 ABOVE/EQUAL TO 65%		-- no. of scores between 65% and 74.99% or no. of grades of 2 in the 0-4 Grading System
1 ABOVE/EQUAL TO 50%		-- no. of scores between 50% and 64.99% or no. of grades of 1 in the 0-4 Grading System
0 BELOW	50%	-- no. of scores between 1% and 50% or no. of grades of 0 in the 0-4 Grading System
Equal to Zero	0%	-- no. of scores at 0% (zeros are not in the above category)

DISTRIBUTION OF SCORES

Report #5

This report is a graph showing the number of students who achieved each score. The range of scores, from zero to highest are printed along the bottom of the graph. The number of occurrences for each score is represented by the number of vertical "X"s in a column and is printed above each column. When the total score exceeds 100 then the graph reverts to using percentage to control the displayed width. When in percentage display then the most frequent score percentage may differ from the mode expressed in Report #4 due to rounding and combining to the nearest whole percentage.

When a single vertical bar exceeds a frequency of 20 then banding of frequencies is used to control the graph height. The scale is indicative of the banding and the exact frequency is displayed vertically above the score or percentage. The displayed character above 20 corresponds to the band and will be self-evident when looking at the graph. This is so as to highlight the grouped scaling. When banding is displayed then a tilde ("~") in the column is used as a visual break.

Success Coefficient Report

Report #6

This report is a graph that shows the percentage of students who correctly responded for each question. The question number is along the bottom of the graph. Percentages are along the left side of the report.

Any question that has a low success rate (less than 20-30% answered the question correctly) should be examined. It is possible that the question was poorly worded and the students had not understood the question or the subject; or the question was too complex for the students' comprehension.

Percentages are rounded down (e.g. 40-49.9% correct is in the 40 band.) 100% will only be indicated if 100% of students got that question correct.

A list of questions with less than 50% correct is indicated at the bottom of the page. The list will wrap around on to the next line if too long and a question number may be split in this circumstance.

Discrimination Index Report by Index

Report #7

This report refers to the comparison of the responses given by the top quarter of the class, versus the responses given by the bottom quarter of the class. Each question is rated on a scale of -10 to +10. If only the top quarter of the class got the correct answer for a question, the

question is given a rating of +10. If the number of students in each quarter is equal, then the question is rated 0. If no one got a question correct, it is rated -10.

A discrimination index is calculated as follows:

$$\text{INDEX} = ((\text{SUM OF ALL CORRECT IN TOP QUARTER}) \\ - (\text{SUM OF ALL CORRECT IN BOTTOM QUARTER})) \\ \text{divided by } (\text{TOTAL NUMBER OF STUDENTS}/4) \\ \text{times } 10$$

All questions with a discriminator greater than +4 or less than -4 should be examined. The greater the discriminator (+/-) the greater the possibility of a poorly worded or extraneous question. The question should be examined for wording and intent.

Where a small number of students are represented in the test then the results may be misleading. A single student shows the worst results (i.e. 0 for right answers, -10 for wrong answers).

A tilde (~) represents an unused question (no instructor answer).

Discrimination Index Report by Question Report #8

Same as Report #7. Report is sequenced by question number.

Distractor Preference Report Report #9

A Distractor is a wrong answer that "distracts" from the possible score. All responses to questions are examined and totals are gathered for each response for each question. The result is a graph that shows totals for all incorrect answers. This report is useful when a question has two answers that are similar but only one is correct. The number of students who chose the second answer can be found on this report. By examining the responses reported in REPORT #1, 2 or 3 for that question, the students making the error can be found. By looking at the students' answer sheet the mistake can be checked.

The question number is along the top of the graph. The incorrect answers given are shown along the left side of the graph. The number of occurrences of incorrect answers is printed below the question number. There is a line for No Response also to see which questions were avoided. The correct answer is indicated with an asterisk (*). Questions with the largest totals should be examined first.

Appendix A Sample Scanner Forms

A Faculty and Student answer sheet.



STUDENT/FACULTY ANSWER SHEET



DIRECTIONS

Make no stray marks.

ACCEPTABLE

For true and false answers; use for True and for False

For alpha answers use 1 through 5 for A through E

Erase clearly or cross out any answer you wish to change.

FOR FACULTY USE ONLY

Faculty Answer /Weighting

Alphabetic Answers
(Default = Numeric)

INSTRUCTOR:

SCHOOL:

STUDENT NAME

Use the first ten letters of your last name. Use your initials if others in the class have the same name.

A	A	A	A	A	A	A	A	A	A
B	B	B	B	B	B	B	B	B	B
C	C	C	C	C	C	C	C	C	C
D	D	D	D	D	D	D	D	D	D
E	E	E	E	E	E	E	E	E	E
F	F	F	F	F	F	F	F	F	F
G	G	G	G	G	G	G	G	G	G
H	H	H	H	H	H	H	H	H	H
I	I	I	I	I	I	I	I	I	I
J	J	J	J	J	J	J	J	J	J
K	K	K	K	K	K	K	K	K	K
L	L	L	L	L	L	L	L	L	L
M	M	M	M	M	M	M	M	M	M
N	N	N	N	N	N	N	N	N	N
O	O	O	O	O	O	O	O	O	O
P	P	P	P	P	P	P	P	P	P
Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
R	R	R	R	R	R	R	R	R	R
S	S	S	S	S	S	S	S	S	S
T	T	T	T	T	T	T	T	T	T
U	U	U	U	U	U	U	U	U	U
V	V	V	V	V	V	V	V	V	V
W	W	W	W	W	W	W	W	W	W
X	X	X	X	X	X	X	X	X	X
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Z	Z	Z	Z	Z	Z	Z	Z	Z	Z

Your name here and bubble in.

TESTNAME

A	A	A	A	A	A	A	A	A	A
B	B	B	B	B	B	B	B	B	B
C	C	C	C	C	C	C	C	C	C
D	D	D	D	D	D	D	D	D	D
E	E	E	E	E	E	E	E	E	E
F	F	F	F	F	F	F	F	F	F
G	G	G	G	G	G	G	G	G	G
H	H	H	H	H	H	H	H	H	H
I	I	I	I	I	I	I	I	I	I
J	J	J	J	J	J	J	J	J	J
K	K	K	K	K	K	K	K	K	K
L	L	L	L	L	L	L	L	L	L
M	M	M	M	M	M	M	M	M	M
N	N	N	N	N	N	N	N	N	N
O	O	O	O	O	O	O	O	O	O
P	P	P	P	P	P	P	P	P	P
Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
R	R	R	R	R	R	R	R	R	R
S	S	S	S	S	S	S	S	S	S
T	T	T	T	T	T	T	T	T	T
U	U	U	U	U	U	U	U	U	U
V	V	V	V	V	V	V	V	V	V
W	W	W	W	W	W	W	W	W	W
X	X	X	X	X	X	X	X	X	X
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

Place division number here and bubble in.

HUMBER NUMBER

0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

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