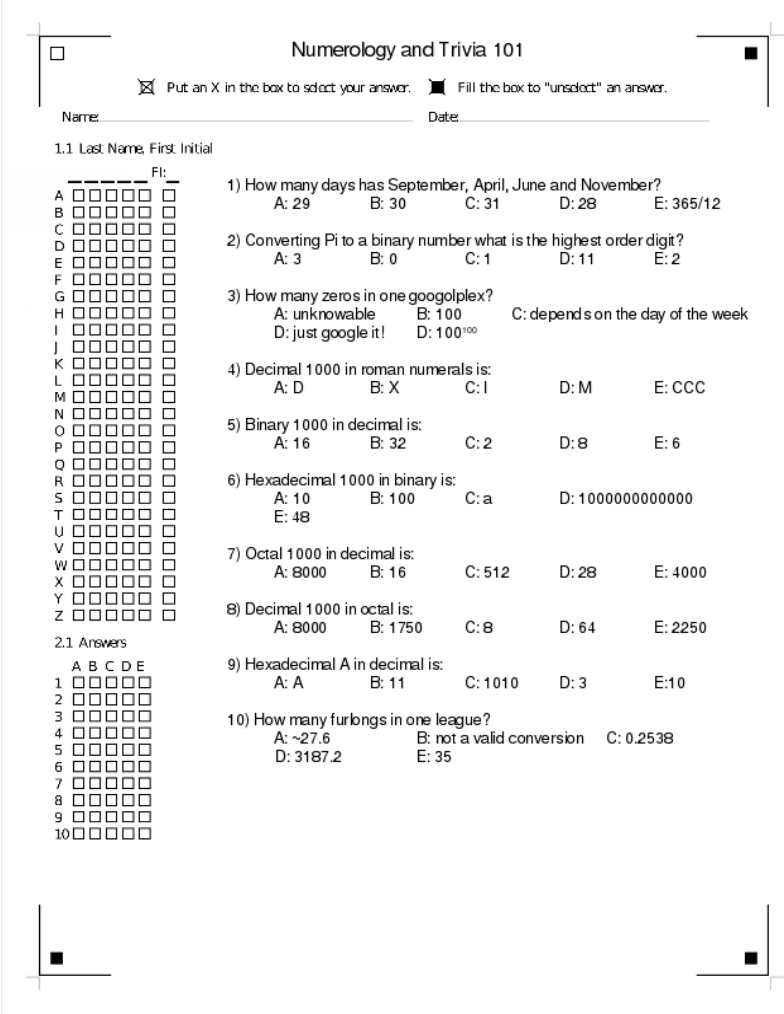
# Gradetest

A program for automated grading of multiple choice tests: checkbox forms with sections for identification and answer selection. Question and title sections can be edited in MS word or openoffice/libreoffice.

*Figure 1 - Example Test*



Numerology and Trivia 101

☒ Put an X in the box to select your answer. ■ Fill the box to "unselect" an answer.

Name: Date:

1.1 Last Name, First Initial

FI:

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

2.1 Answers

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2 | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3 | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4 | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5 | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6 | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7 | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8 | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9 | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10 | ☐ | ☐ | ☐ | ☐ | ☐ |

1) How many days has September, April, June and November?
A: 29 B: 30 C: 31 D: 28 E: 365/12

2) Converting Pi to a binary number what is the highest order digit?
A: 3 B: 0 C: 1 D: 11 E: 2

3) How many zeros in one googolplex?
A: unknowable B: 100 C: depends on the day of the week
D: just google it! D: $100^{100}$

4) Decimal 1000 in roman numerals is:
A: D B: X C: I D: M E: CCC

5) Binary 1000 in decimal is:
A: 16 B: 32 C: 2 D: 8 E: 6

6) Hexadecimal 1000 in binary is:
A: 10 B: 100 C: a D: 1000000000000
E: 48

7) Octal 1000 in decimal is:
A: 8000 B: 16 C: 512 D: 28 E: 4000

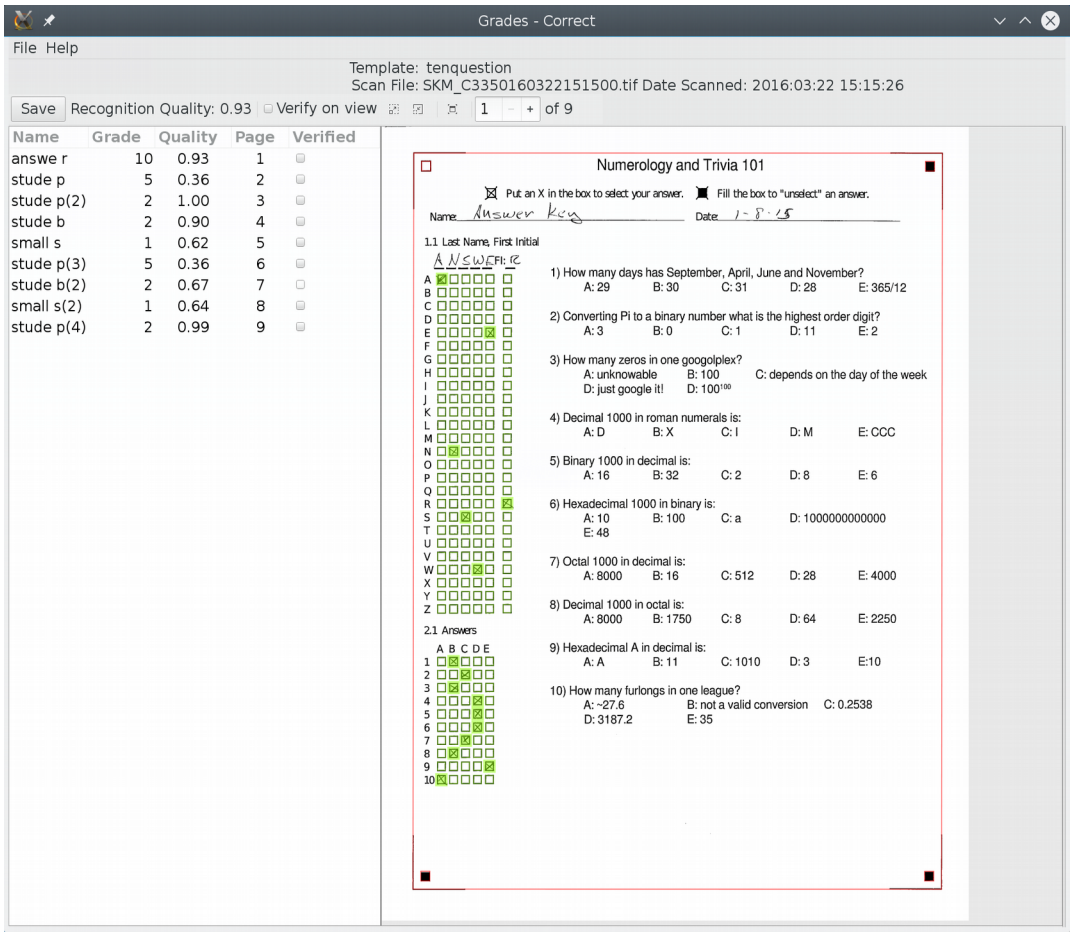
8) Decimal 1000 in octal is:
A: 8000 B: 1750 C: 8 D: 64 E: 2250

9) Hexadecimal A in decimal is:
A: A B: 11 C: 1010 D: 3 E:10

10) How many furlongs in one league?
A: ~27.6 B: not a valid conversion C: 0.2538
D: 3187.2 E: 35

A scan of the competed test pages are processed and interactively reviewed by the grader.

*Figure 2 - Test Review Window*




Results can be saved to a pdf or csv file. Templates for five, ten, fifteen, twenty, thirty, forty and fifty questions are supplied in doc, pdf and tex formats.

## Implementation

Gradetest is a python Gtk program built on top of the opensource SDAPS scripts. It requires sdaps - but not necessarily tex or latex if you use the supplied templates. It was built on Fedora linux using python2.7 but should run on other platforms where sdaps can be installed. This is a free and opensource program and comes with *no warranties or performance guarantees*.

## Installation

Install SDAPS. It is not necessary to install tex if you are going to use the supplied templates. Beyond the SDAPS dependencies the python exif module is needed. In fedora this is the python-exif package.

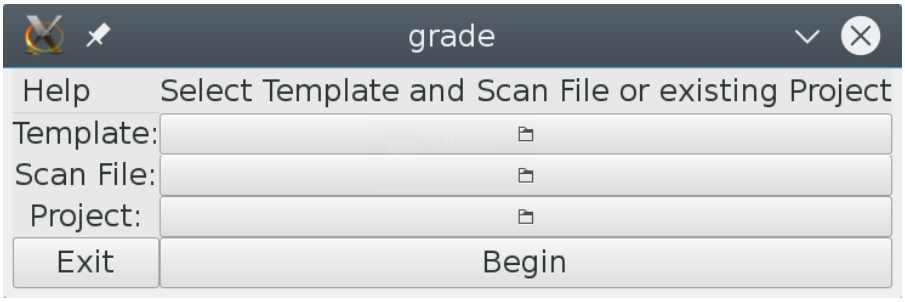
Download the Grades.tar archive. Unpack this into your home directory (tar xf Grades.tar) where it will create the Grades subtree. $HOME/Grades is a requirement, that may change in the future but it is a limitation at this time. Also the first time you run the program it will create a $HOME/.Grade file so be warned in the unlikely event you already have these in your home directory.

The contents of the Grades directory:

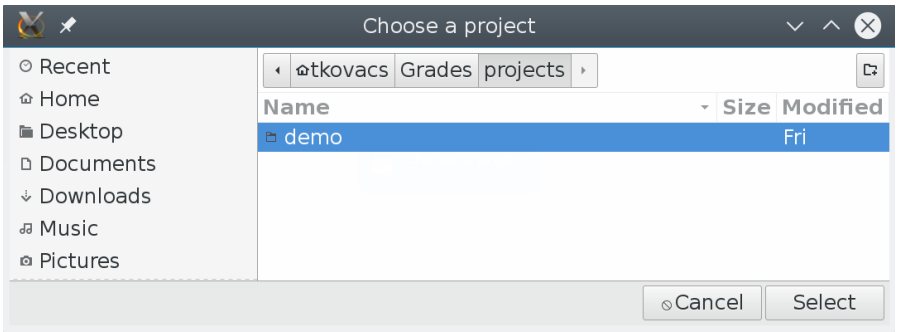
- grade – the python program that starts the process
- gradetest – the python module
- doc – MS Word versions of the test templates
- pdf – pdf versions of the test templates
- tex – latex versions of the test templates
- templates – specific templates for each type of test
- projects – the place where previously graded tests are stored
- share – supporting files for the gradetest program

## Tutorial

From a command prompt cd into the Grades directory and run the grade program.
The session begins with this selection window:




You need to select a template and scan file or an existing scanned project. There is a demo project included in the download. To load the demo, select the project button then select demo under projects:




and then the SKM_... directory under projects/demo and finally press the “Select” button:

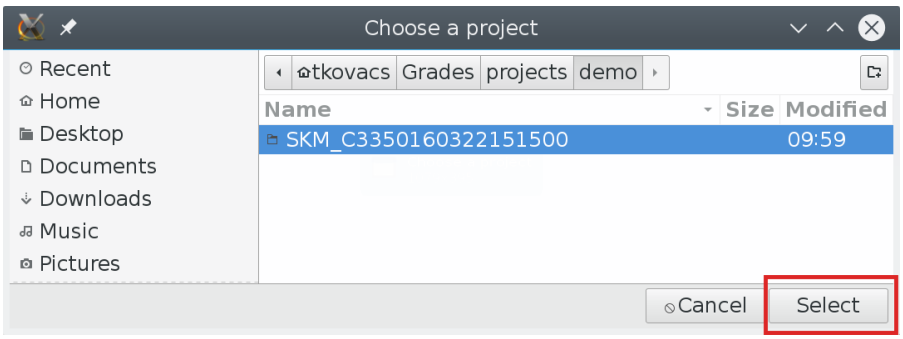
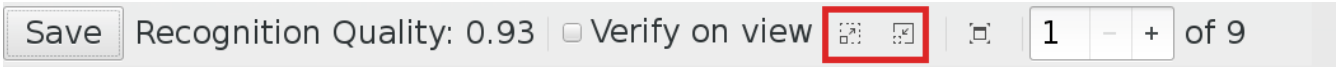


*Figure 2* above should be the result. New projects will be save in the projects directory where "demo" will be replaced by the date they were created and further qualified by the name of the scan file that contained the images of the test pages – the "SKM_…" in the demo example.

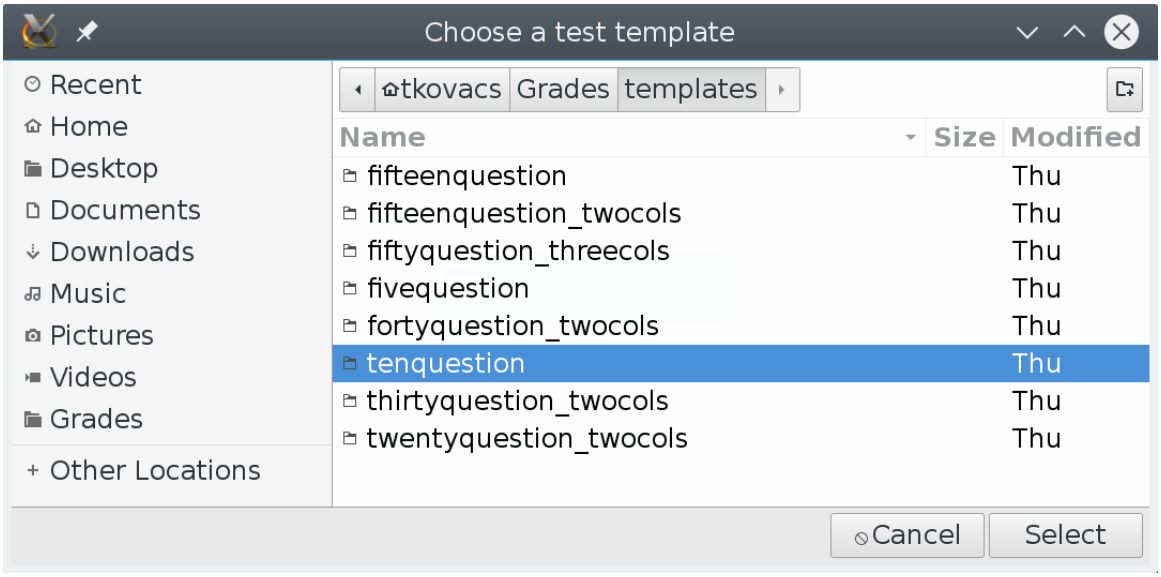
There are controls to "zoom" the image pane to a convenient size:



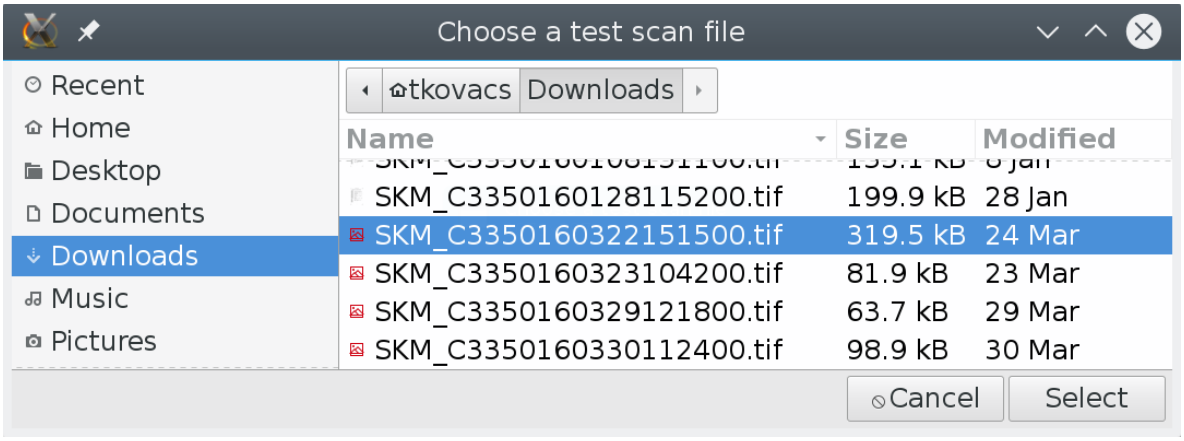

The table of scan results on the left can be sorted by selecting any of the column headers but the answer key will always be sorted to the top row. The answer key is automatically determined by finding the sheet with "answe r" in the name boxes. The program allows for more than one possible correct answer to a question. If more than one answer is marked on the answer key for a given question then a test that has any or all of those marked (but no others) will be credited with the correct answer. The image pane colors green the checked boxes as the SDAPS algorithm determined them. If there is an error (a wrong box is green) the mouse can be used to make corrections by selecting/deselecting the boxes in the image and the "Grade" or "Name" fields will be updated accordingly. The program disambiguates names by appending "(digit)" to the name field. The "Verified" check box is for the reviewers convenience. Selecting the "Verify on view" box on the control bar will automatically mark the "Verified" box after each page has been viewed.
The "Quality" field is SDAPS's estimation of it's success in finding the marked boxes. One possible work flow is to sort by quality, select the top row and move through each of the images using the keyboard arrow keys.
The "File" menu has entries to save the results as a CSV or PDF file and the dialogue allows for entry of "supporting information" to be saved with the results.

## Grading your own test

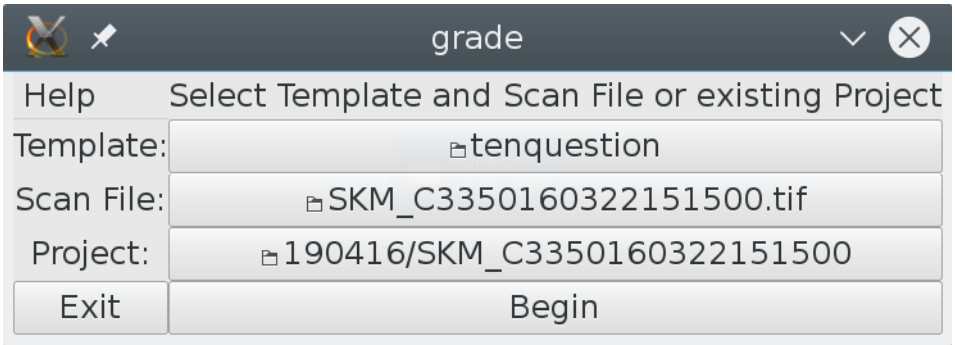
Scan your completed tests to a black and white multipage TIF file. Start the program and select the template that was used for the test. Note that selecting a template is selecting a directory containing the files that describe it - not a specific file in that directory:




Next select the scan file:




A new project directory is created using today's date and the scan file name:




Press the "Begin" button and wait for the test review window.