

Assignment #3

Making Algebra Fun!!!

Due: Sunday, 10/22/17, 11:59pm

Grading: Every assignments in this course is graded by demoing your work for 10 minutes with a TA. You are required to **meet with a TA within two weeks of the due date** to demo. You can schedule a demo with a TA on the [home page](#) in the far right column of the bottom table labeled "Grading Hours".

- **Demo Outside 2 Weeks:** Assignments that are not demo'd within the acceptable time period will be subject to a 50 point deduction.
- **Demo Late Assignments:** Late assignments must still be demoed within the two week demo period beginning from the assignment's original due date.
- **Missing a Demo:** If you miss your demo with a TA, you will receive a 10 point (one letter grade) deduction to that assignment for each demo missed.

Your job is to convince the TA that your program works correctly, i.e. show your TA how to use/break your program 😊

Problem Statement

We have been tasked to implement a program/application that makes learning algebra fun! This program will ask the student if they want to solve an addition, multiplication, subtraction, division, or random one-variable equation. The student is in an elevator and trying to get all the way to the top floor of a building for the gold prize by solving each equation correctly and moving up or down floors based on their answer!

You will ask the student how many floors there are in the building to start, and when the student solves the equation correctly, they get to go up one floor closer to the gold. If the user solves the equation incorrectly, then they go down one floor.

After the student solves the equation, you must re-prompt the student for which type of equation they want solve again (addition, multiplication, subtraction, division, or random), until they reach the gold on the top floor of the building. The numbers in the equations are between 0-100 (inclusive), and you will generate one number for the expression and one number for the solution/right side of the equation. After the student reaches the gold, you must ask the student if they want to play again.

You must always inform the user which level of the building they are on with a message and ASCII art!!! 😊 You must insert a blank line between re-prompting the student with a new equation to solve. If the student wins and wants to play again, you must ask how many floors are in the new building.

For example:

How many floors are in your building? 3

```
|   |  
-----  
|   |  
-----  
| X |  
-----
```

Do you want to solve a multiplication (1), addition (2), subtraction (3), division (4), or random (5) equation? 1

Solve $x * 10 = 100$, what is x? 10

Good job, you are on level 2!

```
|   |  
-----  
| X |  
-----  
|   |  
-----
```

Do you want to solve a multiplication (1), addition (2), subtraction (3), division (4), or random (5) equation? 2

Solve $x + 50 = 4$, what is x? -46

Good job, you are on level 3!

```
| X |  
-----  
|   |  
-----  
|   |  
-----
```

You win the game!!!

Do you want to play again (0=yes, 1=no)? 1

Requirements:

- Catch all bad input (bad cases, non-matching types, etc.)!!!
- Have at least 3 functions!
- Display a message and asking ASCII art showing where the student is in the elevator.
- Ask the user if they want to re-play the game after winning.

Creative Contest!!! Who has the most entertaining program with ASCII art? You have to let us know if you want to enter the contest, and the students will vote on who has the best user interface.

(10 pts) **Extra Credit**

All your functions, including main, must not be more than 15 lines in length!!!

(10 pts) **Program Style/Comments**

In your implementation, make sure that you include a program header in your program, in addition to proper indentation/spacing and other comments! Below is an example header to include. Make sure you review the style guidelines for this class, and begin trying to follow them, i.e. don't align everything on the left or put everything on one line!

http://classes.engr.oregonstate.edu/eecs/fall2017/cs161-001/assignments/161_style_guideline.pdf

```
/******  
** Program: algebra.cpp  
** Author: Your Name  
** Date: 10/15/2017  
** Description:  
** Input:  
** Output:  
*****/
```

Electronically submit your C++ program (.cpp file, not your executable!!!) by the assignment due date, using TEACH.

https://secure.engr.oregonstate.edu:8000/teach.php?type=want_auth

Make sure you demo Assignment #2 within two weeks of the due date to receive full credit. If you go outside the two week limit without permission, you will lose 50 points. If you fail to show up for your demo without informing anyone, then you will automatically lose 10 points.