# Assignment IP.1

**Due** Oct 29, 2020 by 1pm **Points** 127 **Submitting** a file upload
**Available** Oct 22, 2020 at 12am - Oct 29, 2020 at 11:59pm 8 days

This assignment was locked Oct 29, 2020 at 11:59pm.

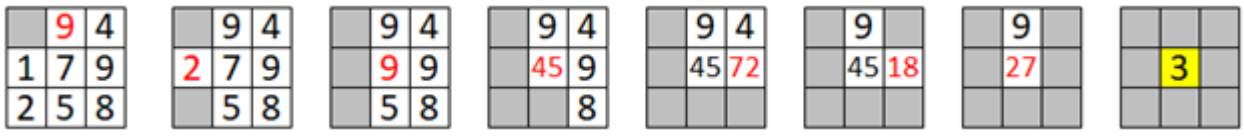
# Individual Project CS 3733

Your task is to develop a small standalone application in Java to enable a user to play a mathematical game on a 3x3 grid of tiles where each tile can contain a positive integer.


The goal is to reduce 9 integers into a single value in the center of the grid, using a sequence of moves. Each move consists of a *starting* tile containing a number and a *target* tile containing a number. If the move is **valid**, the starting tile is cleared and the target tile is recomputed, as follows:

- Move **Right** to add: Move **1** right to **7**, to add 1 to 7, resulting in 1+7 = 8
- Move **Left** to subtract: Move **4** left to **6**, to subtract 4 from 6, resulting in 6 - 4 = 2
- Move **Up** to multiply: Move **5** up to **7**, to multiply 7 by 5, resulting in 5 x 7 = 35
- Move **Down** to divide: Move **1** down to **2**, to divide 1 into 2, resulting in 2 ¸ 1 = 2; valid only if the result is an integer

One solution above is: **Move 3 Right, Move 2 Up, Move 2 Right, Move 5 Up, Move 8 Up, Move 4 Down, Move 18 Left, Move 9 Down. Solution!**




When you start your application, the puzzle will be in its initial state. Note there are four possible starting configurations, and each student will be assigned one for this project (see initial configurations in Canvas).

From this initial state, the user can quit the application or reset the puzzle to its original configuration. Moving a tile is a two-step operation. First, the user uses the mouse to select a starting tile by clicking on it. Next the user requests to move the tile either up, down, left, or right one square (this could be done by

detecting the key press of one of the arrow keys, or you could have four buttons for up, down, left, or right, or you could do a drag/swipe action which is a bit complicated in Java). Naturally only valid moves should be allowed.

When only the center tile contains a value, the user has won, and should be congratulated! If the user has not won and is unable to make a valid move, the user has lost, and should be consoled.

# IP.1 Due Thursday October 29th at 1:00 PM (5% of total grade)

The first deliverable is due in the second week of the course. This deliverable will contain:

- A set of use cases, formatted and structured using the examples presented in class
- A mock-up interface (also called a storyboard) that graphically shows what the interface will look like. Identify each actionable element on the mockup and explain (briefly) how user interacts to perform the necessary tasks

# What comes next?

**Assignment IP2** is due Monday November 9th at 11:59 PM. Be aware of the deadlines!

# Updates

- **2020-10-22 11:00 PM** I amended the description to explain that the user may end up in a losing position.