Homework #3

- Full name only: _____
- Release date: Oct 10, 2022 (Monday), 5:15 PM
- Due date: **Oct 19, 2022 (Wednesday), 4:00 PM**
- It should be done INDIVIDUALLY; Show ALL your work; Submit your source code and results through Canvas.
- Total: 20 pts

1. Given an M x N rectangular grid, write a program to discover all routes in the grid starting at the source (0, 0) and ending at the destination (M-1, N-1). During the discovery, you can move down or right or diagonally (down-right), but not up or left. Here is a set of requirements to follow:
   - Type the homework number and your full name at the top in your all source codes.

   ```
   /* Homework #3, James Bond */
   ```

   - Your program should be a menu-driven and execute the chosen command. If you type 3, then exit the program.

   ```
                        M E N U

            Horizontal Axis (0), Vertical Axis (1), Start
            Discovery (2), Exit Program (3)

                        Choose?
   ```

   - Show ALL your work. For example,

   ```
                        M E N U

            Horizontal Axis (0), Vertical Axis (1), Start
            Discovery (2), Exit Program (3)

                        Choose?  0   3



                        M E N U

            Horizontal Axis (0), Vertical Axis (1), Start
            Discovery (2), Exit Program (3)

                        Choose?  1   2



                        M E N U

            Horizontal Axis (0), Vertical Axis (1), Start
            Discovery (2), Exit Program (3)

                        Choose?  1   3
   ```
(Note: The user changed the size of Vertical Axis via entering a new value. The program should be flexible with change before discovery.)

```
                      M E N U

          Horizontal Axis (0), Vertical Axis (1), Start
          Discovery (2), Exit Program (3)

                     Choose?   2

                 [ 1, 4, 7, 8, 9 ]
                 [ 1, 4, 5, 8, 9 ]
                 [ 1, 4, 5, 6, 9 ]
                 [ 1, 4, 5, 9 ]
                 [ 1, 4, 8, 9 ]
                 [ 1, 2, 5, 8, 9 ]
                 [ 1, 2, 5, 6, 9 ]
                 [ 1, 2, 5, 9 ]
                 [ 1, 2, 3, 6, 9 ]
                 [ 1, 2, 6, 9 ]
                 [ 1, 5, 8, 9 ]
                 [ 1, 5, 6, 9 ]
                 [ 1, 5, 9 ]


                      M E N U

          Horizontal Axis (0), Vertical Axis (1), Start
          Discovery (2), Exit Program (3)

                     Choose?

                         .
                         .
                         .
```

2. The idea is to use recursion to discover all routes.

3. Submit your all source codes and results (e.g., screen copy) through Canvas before the due date, **Oct 19, 2022 (Wednesday), 4:00 PM**. The TA will build and run your source codes and test with a random input.
- Source codes – The file name should be "your name + homework number", e.g., james_bond_3.cpp, james_bond_3.h, etc.
- Results in a WORD file (e.g., screen copy)
    - o Self-testing is required before the submission.