CMPT 420: Artificial Intelligence
Professor Tian
Project 3: 8-Queens Solution using Hill-Climbing Search (Steepest Ascent)

Team Members
Natalie McGovern
Sanjay Sewbhajan

Board Configuration

	0	1	2	3	4	5	6	7
0	Q	-	-	-	-	-	-	-
1	-	-	-	-	-	-	Q	-
2	-	-	-	-	Q	-	-	-
3	-	-	-	-	-	-	-	Q
4	-	Q	-	-	-	-	-	-
5	-	-	-	Q	-	-	-	-
6	-	-	-	-	-	Q	-	-
7	-	-	Q	-	-	-	-	-

- Possible solution
- Row number
- Column number

Specifications

- Complete state formulation (initial state has all 8 queens placed randomly)
- Board is stored as a 1D array (int[64])

Functions

```
void HCS(int[]);
void generateChild(int[],int);
int numOfAttacks(int[]);
void generateRandom(int[]);
int findIndex(int,int);
void arrCopy(int[],int[]);
void swap(int[],int,int);
void displayBoard(int[]);
```

Function	Description
void HCS(int[]);	Hill-Climbing Search algorithm. Accepts initial state as input. Solution is assigned to initial state.
void generateChild(int[]);	Generates a child state of given board.
int numOfAttacks(int[]);	Returns number of attacks (row, major diagonal, minor diagonal) of given board.
void generateRandom(int[]);	Accepts empty board (no queens) as input. Generates random board with all 8 queens placed.
int findIndex(int,int);	Returns index for given row and column.
void arrCopy(int[],int[]);	Manual array copy.
void swap(int[],int,int);	Swaps elements at given indices within given board.
void displayBoard(int[]);	Displays given board as 8x8 with empty spaces as “-“ and queens as “Q”.