

FAIL

initBoard()

```
58 void Board::initializeGameBoard(Cell gameBoard[][COLS]) {
59 // int i = 0, j = 0;
60 // for (i = 0; i < ROWS; i++) {
61 //     for (j = 0; j < COLS; j++) {
62 //         gameBoard[i][j].symbol = WATER;
63 //         gameBoard[i][j].position.row = i;
64 //         gameBoard[i][j].position.column = j;
65 //     }
66 // }
67 }
68
69 /**
70  * Function name : printGameBoard ()
71  * Date Created : 17 October 2012
72  * Usage : printGameBoard (Cell [][], Boolean);
73  * Definition : This function prints the game board on the console
74  *              screen with an option of showing or not showing
75  * Pre-condition : Game board is of Cell struct type and showPegs
76  *                  if Boolean enum type
77  * Post-condition: Game board printed on console screen
78  */
```

Problems Tasks Console Properties Debug

SystemsHW6 Debug [C/C++ Application]

!!!Hello World, Let's do HW6!!!

Starting testInitBoard

testInitBoard did not pass.

printGameBoard()

```
79 void Board::printGameBoard(Cell gameBoard[][COLS], Boolean showPegs) {
80 // int i = 0, j = 0;
81 //
82 // printf (" 0 1 2 3 4 5 6 7 8 9\n");
83 //
84 // for (i = 0; i < ROWS; i++) {
85 //     printf ("%d ", i);
86 //     for (j = 0; j < COLS; j++) {
87 //         if (showPegs == TRUE)
88 //             printf ("%c ", gameBoard[i][j].symbol);
89 //         else {
90 //             switch (gameBoard[i][j].symbol) {
91 //                 case HIT: printf ("%c ", HIT); break;
92 //                 case MISS: printf ("%c ", MISS); break;
93 //                 case WATER:
94 //                     printf ("%c ", WATER); break;
95 //             }
96 //         }
97 //     }
98 //     putchar ('\n');
99 // }
100 }
101
102 /**
103  * Function name : putShipOnGameBoard ()
104  * Date Created : 17 October 2012
105  */
```

Problems Tasks Console Properties Debug

<terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake\OneDrive\Desktop\Algorithms 2223\SystemHW6\Debug\SystemHW6.exe (10/9/21, 3:32 PM)

!!!Hello World, Let's do HW6!!!

Starting testInitBoard

testInitBoard did pass

Starting testPrintGameBoard

Looks like a battleship game board? (y/n):n

testPrintGameBoard did not pass.

putShipOnGameBoard()

```
111 void Board::putShipOnGameBoard(Cell gameBoard[][COLS], WaterCraft ship, Coordinate position, int direction) {
112 // int i = ship.length - 1;
113 //
114 // for (i = 0; i < ship.length; i++) {
115 //     if (direction == HORIZONTAL)
116 //         gameBoard[position.row][position.column + i].symbol = ship.symbol;
117 //     else /* VERTICAL */
118 //         gameBoard[position.row + i][position.column].symbol = ship.symbol;
119 // }
120 }
121
122 /**
123  *
124  */
125 }
```

Problems Tasks Console Properties Debug
<terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake1\OneDrive\Desktop\Algorithms 2223\SystemHW6\Debug\SystemHW6.exe (10/9/21, 3:33 PM)

Looks like a battleship game board? (y/n):y
testPrintGameBoard did pass
Starting testPutShipOnGameBoard
testPutShipOnGameBoard did not pass.

randomlyPlaceShipsOnGameBoard()

```
192 void Board::randomlyPlaceShipsOnGameBoard(Cell gameBoard[][COLS], WaterCraft ship[]) {
193 // Coordinate position;
194 // int direction = -1;
195 // int i = 0;
196 //
197 // for (i = 0; i < NUM_OF_SHIPS; i++) {
198 //     while (TRUE) {
199 //         direction = getRandomNumber (0, 1); /* 0 -> horizontal, 1 -> vertical */
200 //         position = generatePosition (direction, ship[i].length);
201 //         if (isValidLocation (gameBoard, position, direction, ship[i].length)) break;
202 //     }
203 // }
204 //
205 // putShipOnGameBoard (gameBoard, ship[i], position, direction);
206 // }
207 }
208
209 /**
210 * Function name : updateGameBoard ()
211 */
212 }
```

Problems Tasks Console Properties Debug
<terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake1\OneDrive\Desktop\Algorithms 2223\SystemHW6\Debug\SystemHW6.exe (10/9/21, 3:33 PM)

Starting testPutShipOnGameBoard
testPutShipOnGameBoard did pass
Starting testRandomlyPlaceShipsOnGameBoard
testRandomlyPlaceShipsOnGameBoard did not pass.

updateGameBoard()

```
218 void Board::updateGameBoard(Cell gameBoard[][COLS], Coordinate target) {
219 // switch (gameBoard[target.row][target.column].symbol) {
220 //     /* miss */
221 //     case WATER:
222 //         gameBoard[target.row][target.column].symbol = MISS;
223 //         break;
224 //
225 //     /* hit */
226 //     case CARRIER:
227 //     case BATTLESHIP:
228 //     case CRUISER:
229 //     case SUBMARINE:
230 //     case DESTROYER:
231 //         gameBoard[target.row][target.column].symbol = HIT;
232 //         break;
233 //
234 //     case HIT:
235 //     case MISS:
236 //     default:
237 //         break;
238 // }
```

Problems Tasks Console Properties Debug

```
<terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake\OneDrive\Desktop\Algorithms 2223\System HW6\Debug\System HW6.exe
Starting testUpdateGameBoard
testUpdateGameBoard did not pass.
Starting testCheckBoundsOfCardinal
testCheckBoundsOfCardinal did pass
Starting testGetRandomNumber
testGetRandomNumber did pass
Starting testUpdateGameBoard
testUpdateGameBoard did not pass.
```

checkBoundsOfCardinal()

```
250 /*
251 void Board::checkBoundsOfCardinal(Boolean cardinals[], int bound, int direction) {
252 // switch (direction) {
253 //     case NORTH:
254 //         if (bound < 0)
255 //             cardinals[0] = FALSE;
256 //         else
257 //             cardinals[0] = TRUE;
258 //         break;
259 //
260 //     case SOUTH:
261 //         if (bound > 9)
262 //             cardinals[1] = FALSE;
263 //         else
264 //             cardinals[1] = TRUE;
265 //         break;
266 //
267 //     case WEST:
268 //         if (bound < 0)
269 //             cardinals[2] = FALSE;
270 //         else
271 //             cardinals[2] = TRUE;
272 //         break;
273 //
274 //     case EAST:
275 //         if (bound > 9)
276 //             cardinals[3] = FALSE;
277 //         else
278 //             cardinals[3] = TRUE;
279 // }
```

Problems Tasks Console Properties Debug

```
<terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake\OneDrive\Desktop\Algorithms 2223\System HW6\Debug\System HW6.exe (10/9/21, 4:03 PM)
Starting testCheckBoundsOfCardinal
testCheckBoundsOfCardinal did not pass.
```

<p>getRandomNumber()</p>	<pre> 547 int Board::getRandomNumber(int lowest, int highest) { 548 // if (lowest == 0) 549 // return rand() % ++highest; 550 // 551 // if (lowest > 0) 552 // return rand() % ++highest + lowest; 553 } 554 </pre> <p>Problems Tasks Console Properties Debug</p> <p><terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake1\OneDrive\Desktop\Algorithms 2223\testCheckBoundsOfCardinal did not pass.</p> <p>Starting testGetRandomNumber</p> <p>testGetRandomNumber did not pass.</p>
<p>isWinner()</p>	<pre> 447 Boolean Board::isWinner(Stats players[], int player) { 448 Boolean isWin = FALSE; 449 450 // if (players[player].numHits == 17) 451 // isWin = TRUE; 452 453 return isWin; 454 } 455 456 /** 457 * Function name : generatePosition () </pre> <p>Problems Tasks Console Properties Debug</p> <p><terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake1\OneDrive\Desktop\Algorithms 2223\testUpdateGameBoard did pass</p> <p>Starting testIsWinner</p> <p>testIsWinner did not pass.</p>
<p>checkShot()</p>	<pre> 510 short Board::checkShot(Cell gameBoard[][COLS], Coordinate target) { 511 // int hit = -2; 512 // 513 // switch (gameBoard[target.row][target.column].symbol) { 514 // /* miss */ 515 // case WATER: 516 // hit = 0; 517 // break; 518 // 519 // /* hit */ 520 // case CARRIER: 521 // case BATTLESHIP: 522 // case CRUISER: </pre> <p>Problems Tasks Console Properties Debug</p> <p><terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake1\OneDrive\Desktop\Algorithms 2223\SystemsHW6\Debug\testUpdateGameBoard did pass</p> <p>Starting testIsWinner</p> <p>testIsWinner did pass</p> <p>Starting testCheckShot</p> <p>testCheckShot did not pass.</p>

isValidLocation()

```
381 Boolean Board::isValidLocation(Cell gameBoard[][COLS], Coordinate position,
382                               int direction, int length) {
383 // int i = length - 1;
384 // Boolean isValid = TRUE;
385 //
386 // for (i = 0; isValid && i < length; i++) {
387 //     if (direction == HORIZONTAL) {
388 //         if (gameBoard [position.row][position.column + i].symbol != WAT
389 //             (position.column + i) < COLS)
390 //             isValid = FALSE;
391 //     } else { /* VERTICAL */
392 //         if (gameBoard [position.row + i][position.column].symbol != WAT
393 //             (position.row + i) < ROWS)
394 //             isValid = FALSE;
395 //     }
396 // }
397 //
398 // return isValid;
399 }
```

Problems Tasks Console Properties Debug
<terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake1\OneDrive\Desktop\Algorithms 2223\SystemHW6\Debug\SystemHW6.exe
Starting testIsValidLocation
testIsValidLocation did not pass.

generatePosition()

```
466 Coordinate Board::generatePosition(int direction, int length) {
467 // Coordinate position;
468 //
469 // if (direction == HORIZONTAL) {
470 //     position.row = getRandomNumber (0, ROWS);
471 //     position.column = getRandomNumber (0, COLS - length);
472 // } else { /* VERTICAL */
473 //     position.row = getRandomNumber (0, ROWS - length);
474 //     position.column = getRandomNumber (0, COLS);
475 // }
476 //
477 // return position;
478 }
479
480 /**
481 * Function name : getTarget ()
```

Problems Tasks Console Properties Debug
<terminated> (exit value: 0) SystemsHW6 Debug [C/C++ Application] C:\Users\jake1\OneDrive\Desktop\Algorithms 2223\SystemHW6\Debug\SystemHW6.exe
Starting testIsValidLocation
testIsValidLocation did pass
testGeneratePosition did not pass.

PASS

initBoard()

```
46
47 /**
48  * Function name : initializeGameBoard ()
49  * Date Created  : 17 October 2012
50  * Usage        : initializeGameBoard ();
51  * Definition    : This function displays initializes values of the multi-
52  *                dimensional array called gameBoard.
53  * Pre-condition : ROWS & COLS are defined as constant macros
54  * Post-condition: Array initialize to (~) tilde representing water
55  */
56 void Board::initializeGameBoard(Cell gameBoard[][COLS]) {
57     int i = 0, j = 0;
58     for (i = 0; i < ROWS; i++) {
59         for (j = 0; j < COLS; j++) {
60             gameBoard[i][j].symbol = WATER;
61             gameBoard[i][j].position.row = i;
62             gameBoard[i][j].position.column = j;
63         }
64     }
65 }
66
67 /**
```

Problems Tasks Console Properties Terminal

<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\workspace\HW6\Debug\HW6.exe
!!!Hello World, Let's do HW6!!!
Starting testInitBoard
testInitBoard did pass

printGameBoard()

```
77 void Board::printGameBoard(Cell gameBoard[][COLS], Boolean showPegs) {
78     int i = 0, j = 0;
79
80     printf (" 0 1 2 3 4 5 6 7 8 9\n");
81
82     for (i = 0; i < ROWS; i++) {
83         printf ("%d ", i);
84         for (j = 0; j < COLS; j++) {
85             if (showPegs == TRUE)
86                 printf ("%c ", gameBoard [i][j].symbol);
87             else {
88                 switch (gameBoard [i][j].symbol) {
89                     case HIT: printf ("%c ", HIT); break;
90                     case MISS: printf ("%c ", MISS); break;
91                     case WATER: printf ("%c ", WATER); break;
92                     default: printf ("%c ", WATER); break;
93                 }
94             }
95         }
96         putchar ('\n');
97     }
98 }
99
```

Problems Tasks Console Properties Terminal

<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\workspace\HW6\Debug\HW6.exe
!!!Hello World, Let's do HW6!!!
Starting testInitBoard
testInitBoard did pass
Starting testPrintGameBoard
 0 1 2 3 4 5 6 7 8 9
0 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
1 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
2 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
3 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
4 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
5 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
6 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
7 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
8 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
9 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

Looks like a battleship game board? (y/n):y
testPrintGameBoard did pass

putShipOnGameBoard()

```
101  * Function name : putShipOnGameBoard ()
102  * Date Created : 17 October 2012
103  * Usage : putShipOnGameBoard (Cell [][], WaterCraft, Coordinate, int)
104  * Definition : This function allows you to put the 5 types of ship in the
105  * the game board specified in the formal argument
106  * Pre-condition : n/a
107  * Post-condition: Specific type of ship place on specified target cell
108  */
109 void Board::putShipOnGameBoard(Cell gameBoard[][COLS], WaterCraft ship, Coordinate position, int direction) {
110     int i = ship.length - 1;
111
112     for (i = 0; i < ship.length; i++) {
113         if (direction == HORIZONTAL)
114             gameBoard[position.row][position.column + i].symbol = ship.symbol;
115         else /* VERTICAL */
116             gameBoard[position.row + i][position.column].symbol = ship.symbol;
117     }
118 }
119
```

Problems Tasks Console Properties Terminal

<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\workspace\HW6\Debug\HW6.exe (10/8/21, 8:00 PM)

Looks like a battleship game board? (y/n):y
testPrintGameBoard did pass
Starting testPutShipOnGameBoard
testPutShipOnGameBoard did pass

randomlyPlaceShipsOnGameBoard()

```
190 void Board::randomlyPlaceShipsOnGameBoard(Cell gameBoard[][COLS], WaterCraft ship[]) {
191     Coordinate position;
192     int direction = -1;
193     int i = 0;
194
195     for (i = 0; i < NUM_OF_SHIPS; i++) {
196         while (TRUE) {
197             direction = getRandomNumber (0, 1); /* 0 -> horizontal, 1 -> vertical */
198             position = generatePosition (direction, ship[i].length);
199
200             if (isValidLocation (gameBoard, position, direction, ship[i].length)) break;
201         }
202
203         putShipOnGameBoard (gameBoard, ship[i], position, direction);
204     }
205 }
206
207 /**
208  * Function name : updateGameBoard ()
209  * Date Created : 17 October 2012
210  * Usage : updateGameBoard (Cell [][], Coordinate);
211  * Definition : This function updates the game board whether
212  * its a hit or miss
213  * Pre-condition : n/a
214  * Post-condition: Game board updated with proper symbol
215  */
216
```

Problems Tasks Console Properties Terminal

<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\workspace\HW6\Debug\HW6.exe (10/8/21, 8:00 PM)

Starting testPutShipOnGameBoard
testPutShipOnGameBoard did pass
Starting testRandomlyPlaceShipsOnGameBoard
testRandomlyPlaceShipsOnGameBoard did pass

updateGameBoard()

```
216 void Board::updateGameBoard(Cell gameBoard[][COLS], Coordinate target) {
217     switch (gameBoard[target.row][target.column].symbol) {
218         /* miss */
219         case WATER:
220             gameBoard[target.row][target.column].symbol = MISS;
221             break;
222
223         /* hit */
224         case CARRIER:
225         case BATTLESHIP:
226         case CRUISER:
227         case SUBMARINE:
228         case DESTROYER:
229             gameBoard[target.row][target.column].symbol = HIT;
230             break;
231
232         case HIT:
233         case MISS:
234         default:
235             break;
236     }
237 }
238
239 /**
240  * Function name : checkBoundsOfCardinal ()
241  * Date Created : 17 October 2012
242  */
243
```

Problems Tasks Console Properties Terminal

<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\workspace\HW6\Debug\HW6.exe (10/8/21, 8:00 PM)

testRandomlyPlaceShipsOnGameBoard did pass
Starting testUpdateGameBoard
testUpdateGameBoard did pass

checkBoundsOfCardinal()

```
248  */
249 void Board::checkBoundsOfCardinal(Boolean cardinals[], int bound, int direction) {
250     switch (direction) {
251         case NORTH:
252             if (bound < 0)
253                 cardinals[0] = FALSE;
254             else
255                 cardinals[0] = TRUE;
256             break;
257
258         case SOUTH:
259             if (bound > 9)
260                 cardinals[1] = FALSE;
261             else
262                 cardinals[1] = TRUE;
263             break;
264
265         case WEST:
266             if (bound < 0)
267                 cardinals[2] = FALSE;
268             else
269                 cardinals[2] = TRUE;
270             break;
271
272         case EAST:
273             if (bound > 9)
274                 cardinals[3] = FALSE;
275             else
276                 cardinals[3] = TRUE;
277             break;
278     }
279 }
280
281 /**
282  *
283  */
```

Problems Tasks Console Properties Terminal

<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\eclipse-workspace\HW6\Debug\HW6.exe (10/8/21, 8:00 AM)

testRandomlyPlaceShipsOnGameBoard did pass
Starting testUpdateGameBoard
testUpdateGameBoard did pass
Starting testCheckBoundsOfCardinal
testCheckBoundsOfCardinal did pass
Starting testGetRandomNumber

getRandomNumber()

```
545  */
546 int Board::getRandomNumber(int lowest, int highest) {
547     if (lowest == 0)
548         return rand() % ++highest;
549
550     if (lowest > 0)
551         return rand() % ++highest + lowest;
552 }
553
```

Problems Tasks Console Properties Terminal

<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\eclipse-workspace\HW6\Debug\HW6.exe (10/8/21, 8:00 AM)

Starting testCheckBoundsOfCardinal
testCheckBoundsOfCardinal did pass
Starting testGetRandomNumber
testGetRandomNumber did pass

isWinner()

```
446 Boolean Board::isWinner(Stats players[], int player) {
447     Boolean isWin = FALSE;
448
449     if (players[player].numHits == 17)
450         isWin = TRUE;
451
452     return isWin;
453 }
454
455 /**
```

Problems Tasks Console Properties Terminal

<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\eclipse-workspace\HW6\Debug\HW6.exe

testGetRandomNumber did pass
Starting testUpdateGameBoard
testUpdateGameBoard did pass
Starting testIsWinner
testIsWinner did pass
Starting testCheckShot

checkShot()

```
509 short Board::checkShot(Cell gameBoard[][COLS], Coordinate target) {
510     int hit = -2;
511
512     switch (gameBoard[target.row][target.column].symbol) {
513         /* miss */
514         case WATER:
515             hit = 0;
516             break;
517
518         /* hit */
519         case CARRIER:
520         case BATTLESHIP:
521         case CRUISER:
522         case SUBMARINE:
523         case DESTROYER:
524             hit = 1;
525             break;
526
527         case HIT:
528         case MISS:
529         default:
530             hit = -1;
531             break;
532     }
533
534     return hit;
535 }
536
537 /**
```

Problems Tasks Console Properties Terminal

<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\eclipse-workspace\HW6\Debug\HW6.exe

Starting testIsWinner
testIsWinner did pass
Starting testCheckShot
testCheckShot did pass

isValidLocation()

```
379  */
380  Boolean Board::isValidLocation(Cell gameBoard[][COLS], Coordinate position,
381                                int direction, int length) {
382      int i = length - 1;
383      Boolean isValid = TRUE;
384
385      for (i = 0; isValid && i < length; i++) {
386          if (direction == HORIZONTAL) {
387              if (gameBoard[position.row][position.column + i].symbol != WATER &&
388                  (position.column + i) < COLS)
389                  isValid = FALSE;
390          } else { /* VERTICAL */
391              if (gameBoard[position.row + i][position.column].symbol != WATER &&
392                  (position.row + i) < ROWS)
393                  isValid = FALSE;
394          }
395      }
396
397      return isValid;
398  }
399  }
```

Problems Tasks Console Properties Terminal
<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\eclipse-workspace\HW6\Debug\HW6.exe (10/8/21,
testCheckShot did pass
Starting testIsValidLocation
testIsValidLocation did pass

generatePosition()

```
465  Coordinate Board::generatePosition(int direction, int length) {
466      Coordinate position;
467
468      if (direction == HORIZONTAL) {
469          position.row = getRandomNumber (0, ROWS);
470          position.column = getRandomNumber (0, COLS - length);
471      } else { /* VERTICAL */
472          position.row = getRandomNumber (0, ROWS - length);
473          position.column = getRandomNumber (0, COLS);
474      }
475
476      return position;
477  }
```

Problems Tasks Console Properties Terminal
<terminated> (exit value: -1) HW6.exe [C/C++ Application] C:\Users\jhsu0\eclipse-workspace\HW6\Debug\HW6.exe (10/8
testCheckShot did pass
Starting testIsValidLocation
testIsValidLocation did pass
testGeneratePosition did pass
