

Aidan Griffiths Test sheet 5

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WORKSHEET 5 – TESTING (Battleships)

For this worksheet, the program can be implemented in a number of different ways and demonstrate different features.

Create your own test set to demonstrate strengths and/or limitations of your solution. Use as many of the template boxes below as you need.

- I. Enter a first coordinate
- II. Enter the second coordinate
- III. Enter "10" and "10" as coordinates
- IV. Enter "Y" as a coordinate
- V. Finishing a game (lose)
- VI. Finishing a game (Win)

Test: Entering first coordinate

Screenshot(s) of output:

```
Current Board:
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X

Enter row (0-4): 1

Enter colum (0-4): |
```

Result: Did the programme behave as expected ie syntactically and logically correct?

YES

If YES, comment on what happened.

If NO, what went wrong and why? Comment on how you would fix the problem.

The system accepted "1" as a coordinate and requested the second coordinate.

Test: Entering the second coordinate

Screenshot(s) of output:

```
Enter row (0-4): 1
Enter colum (0-4): 1
HIT
#####
##      ##
#   ###   #
#   #   #   #
#   #   #   #
#   ###   #
##      ##
#####

Current Board:
X X X X X X X X X X
X H X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
```

Result: Did the programme behave as expected ie syntactically and logically correct?

YES

If YES, comment on what happened.

If NO, what went wrong and why? Comment on how you would fix the problem.

The system accepted "1" as the second coordinate and the result was a hit and the hit image was outputted. The board was updated successfully and outputted.

Test: Enter "10" and "10" as coordinates

Screenshot(s) of output:

```
Enter row (0-9): 10

Enter column (0-9): 10
Invalid coordinates. Try again.

Current Board:
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X

Enter row (0-9): |
```

Result: Did the programme behave as expected ie syntactically and logically correct?

YES/NO (delete as appropriate)

If YES, comment on what happened.

If NO, what went wrong and why? Comment on how you would fix the problem.

The system does not accept "10, 10" as a coordinate and therefore makes no changes to the grid

Test: Entering "Y" as a coordinate

Screenshot(s) of output:

```
X X X X X X X X X X
X X X X X X X X X X

Enter row (0-9):
Enter column (0-9): Invalid coordinates. Try again.

Current Board:
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X

Enter row (0-9):
Enter column (0-9): Invalid coordinates. Try again.

Current Board:
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
```

Result: Did the programme behave as expected ie syntactically and logically correct?

NO

If YES, comment on what happened.

If NO, what went wrong and why? Comment on how you would fix the problem.

The system encountered an error and repeatedly entered "Y" as the coordinate and did not end the code. Unfortunately, I could not resolve this issue. I attempted to use else statements with no progress.

Test: Finishing a game (lose)

Screenshot(s) of output:

```
Enter colum (0-9): 4
```

```
Miss
```

```
  ~ ~  
  ~   ~  
~ SPLASH ~  
  ~   ~  
  ~ ~
```

```
Final Board:
```

```
X S X X X X X X X  
X S X S S X X X X  
X S X X X X X X X  
X X X X X X X X X  
X S S H X X X X X  
X X X X X X X X X  
X X X X X X X X X  
X X X X X X X X X  
X X X X X X X X X  
X X X X X X X X X
```

```
Game over. You ran out of turns. You Lose!
```

Result: Did the programme behave as expected ie syntactically and logically correct?

YES

If YES, comment on what happened.

If NO, what went wrong and why? Comment on how you would fix the problem.

The system recognised the user was out of turns and ended the game with the game over message.

Test: Finishing game (Win)

Screenshot(s) of output:

```
Final Board:
X H X X X X X X X X
X H X H H X X X X X
X H X X X X X X X X
X X X X X X X X X X
X H H H X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X
X X X X X X X X X X

Congrats! You have sank all the ships! You win!

C:\Users\aidan\OneDrive\Desktop\University Work\Y
Work\Visual Studio Work GT\WORKSHEET 5 ANSWER\6
```

Result: Did the programme behave as expected ie syntactically and logically correct?

YES

If YES, comment on what happened.

If NO, what went wrong and why? Comment on how you would fix the problem.

The system recognised all ships being sunk and produced the final board with the congratulations message.

Final code:

```
#define _CRT_SECURE_NO_WARNINGS
#include <stdio.h>
#include <stdlib.h>
#define PI 3.142

int main()
{
    char grid[10][10] = {
        {'X','S','X','X','X','X','X','X','X','X'},
        {'X','S','X','S','S','X','X','X','X','X'},
        {'X','S','X','X','X','X','X','X','X','X'},
        {'X','X','X','X','X','X','X','X','X','X'},
        {'X','S','S','X','X','X','X','X','X','X'},
        {'X','X','X','X','X','X','X','X','X','X'},
        {'X','X','X','X','X','X','X','X','X','X'},
        {'X','X','X','X','X','X','X','X','X','X'},
        {'X','X','X','X','X','X','X','X','X','X'},
        {'X','X','X','X','X','X','X','X','X','X'}
    };
    int row, col;
    int turns = 0;
    int maxTurns = 15;
    int shipsHit = 0;
    int totalShips = 8;

    while (turns < maxTurns && shipsHit < totalShips)
    {
        printf("\nCurrent Board:\n");
        for (int i = 0; i < 10; i++)
        {
            for (int j = 0; j < 10; j++)
            {
                if (grid[i][j] == 'H')
                {
                    printf("H ");
                }
                else
                {
                    printf("X ");
                }
            }
            printf("\n");
        }
        printf("\nEnter row (0-9): ");
        scanf("%d", &row);
        printf("\nEnter column (0-9): ");
        scanf("%d", &col);
    }
}
```

```

if (row < 0 || row >= 10 || col < 0 || col >= 10)
{
    printf("Invalid coordinates. Try again. \n");
    continue;
}

else if (grid[row][col] == 'X')
{
    printf("Miss\n");
    printf(
        "  ~ ~ \n"
        " ~ ~ \n"
        " ~ SPLASH ~\n"
        " ~ ~ \n"
        "  ~ ~ \n"
    );
}

else if (grid[row][col] == 'S')
{
    printf("HIT\n");
    printf(" ##### \n");
    printf(" ##  ## \n");
    printf(" #  ### # \n");
    printf("#  # # # \n");
    printf("#  # # # \n");
    printf(" #  ### # \n");
    printf(" ##  ## \n");
    printf(" ##### \n");
    grid[row][col] = 'H';
    shipsHit++;
}

else if (grid[row][col] == 'H')
{
    printf("You have already hit that square...\n");
}

else {
    printf("Please enter a valid coordinate...");
}

turns++;
}

printf("\nFinal Board: \n");
for (int i = 0; i < 10; i++)
{
    for (int j = 0; j < 10; j++)
    {
        printf("%c ", grid[i][j]);
    }
    printf("\n");
}

```

```
    if (shipsHit == totalShips)
    {
        printf("\nCongrats! You have sank all the ships! You win!\n");
    }
    else
    {
        printf("\nGame over. You ran out of turns. You Lose!\n");
        return 0;
    }
}
```

Aidan Griffiths Test sheet 5

GRADEMARK REPORT

FINAL GRADE

19/0

GENERAL COMMENTS

WORKSHEET 5

Coding- You have created a reasonable battleships game with ability to sink ships and end the game once all have been sunk.

You are missing more advanced features such as randomising the game (this in turn brings problems to solve, such as boats not overlapping on the grid)

Good use of validation for the coordinates

No function use - this would help to streamline your program, particular once more advanced features are used.

9/15

Testing - Careful that "I" doesn't creep in "I could not resolved this" -> this could not be resolved. Good presentation for the features developed

10/15

Overall mark Worksheet 5: 19/30

**Organisation of report, writing style,
presentation of work**

Neatly presented overall, just watch that you don't slip on your writing style :)

9/10

Overall mark for assignment (5 worksheets) -
78.5%

Test mark - 71%

Overall mark for module: 76%

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