BATTLESHIP

The **Skeleton Program** accompanying this **Preliminary Material** is a program for the one-player game BATTLESHIP.

The aim of the game is to destroy all the ships that have been hidden in a 10 x 10 grid called the board.

Before the start of the game the computer places five ships on the board. The player is not told where the ships are placed.

Each ship occupies a number of consecutive squares on the board determined by the type of ship that it is:

Ship type	**Length of ship (in squares)**
Aircraft Carrier (`A`)	5
Battleship (`B`)	4
Submarine (`S`)	3
Destroyer (`D`)	3
Patrol Boat (`P`)	2

Each square will either be empty or be occupied by at most one ship. The ships can only be placed horizontally or vertically on the board and cannot be placed diagonally.

The player fires a shot by specifying the location of a square on the board. To specify the location of a square the player enters a column number (between 0 and 9) and then a row number (between 0 and 9).

If the shot fired hits a ship it is called a 'hit' and the symbol '`h`' is used to show this on the board, otherwise it is called a 'miss' and the symbol '`m`' is used to show this on the board.

A ship is destroyed when all the squares that it occupies have been ‘hit’. The player wins the game when all the ships have been destroyed.

In the Skeleton Program there is a menu containing three options: `'Start new game'`, `'Load training game'` and `'Quit'`.

If the user chooses `'Start new game'` the computer randomly places the five ships on the board making sure that no ships overlap.

If the user chooses `'Load training game'` then a new game will start with the boats positioned at the locations shown in **Figure 1**. The **Skeleton Program** makes use of the **Training.txt Data File** to position the ships.

Figure 1

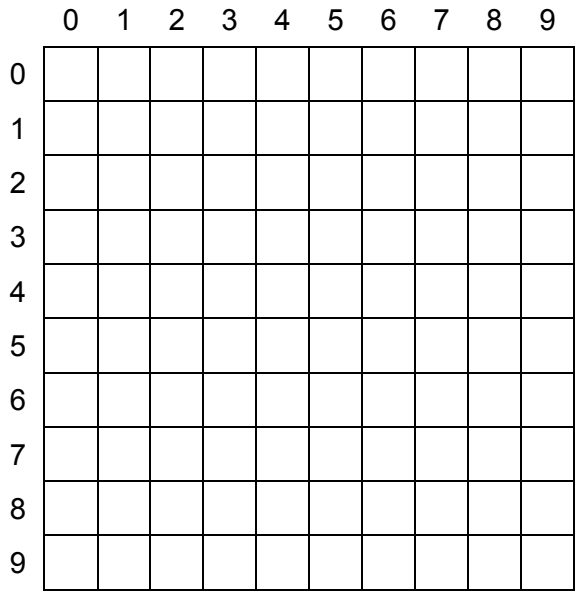
	0	1	2	3	4	5	6	7	8	9
0										
1									B	
2									B	
3									B	
4		P							B	
5		P								
6								S		
7								S		
8		A	A	A	A	A		S		
9						D	D	D		

To indicate that a square is occupied by a ship the first character of its ship type, eg `D` for Destroyer, is stored in the corresponding position in the `Board` data structure.

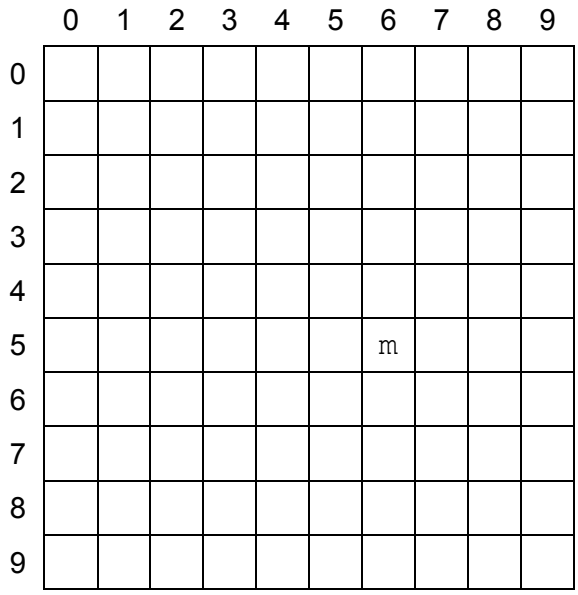
Preliminary Material continues on the next page

Figure 2 shows part of a possible game, using the training game, as displayed to the player.

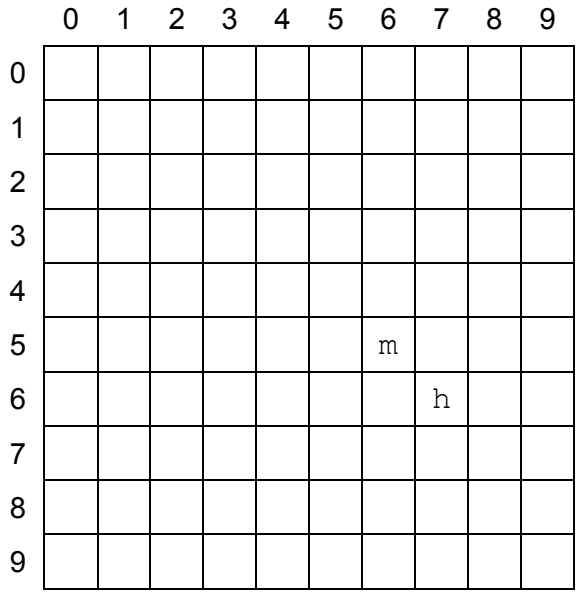
Figure 2



A blank board is displayed at the start of the game.



The player fires a shot at column 6, row 5 and this is recorded as a miss.



The player fires a shot at column 7, row 6 and this is recorded as a hit.

Data File

A **Data File** named **Training.txt** is supplied with the **Skeleton Program**. This stores the positions of the ships in the training game.

END OF PRELIMINARY MATERIAL