

Computer Science Summer homework

Part 1 – Caesar Cipher

In a programming language of your choosing create a program that allows the user to input a message string. The program can then encrypt or decrypt the message using a Caesar Cipher.

Part 2 – Encrypted Battleships

My Ships											Enemy Ships										
	1	2	3	4	5	6	7	8	9	10		1	2	3	4	5	6	7	8	9	10
A											A										
B											B										
C											C										
D											D										
E											E										
F											F										
G											G										
H											H										
I											I										
J											J										

Battleships is a game where you and your opponent place your ships on a grid. You then take turns guessing at the location of your enemy ships, if you get a hit you guess again, if you miss then it's your opponent's turn. The winner is the first to sink all the enemy ships. The ships for our game are:

Aircraft Carrier – 6x1

Battleship – 5x1

Cruiser – 4x1

Submarine – 3x1

Patrol Boat – 2x1

Where does the encryption come in? What we want is a way of communicating where your ships are located that the enemy won't understand. Your task is to create an encryption scheme that allows you to describe where your ships will be placed without the enemy understanding it. A simple example:

Encryption Key:

A = Aircraft Carrier, B = Battleship, C = Cruiser, S = Submarine, P = Patrol Boat

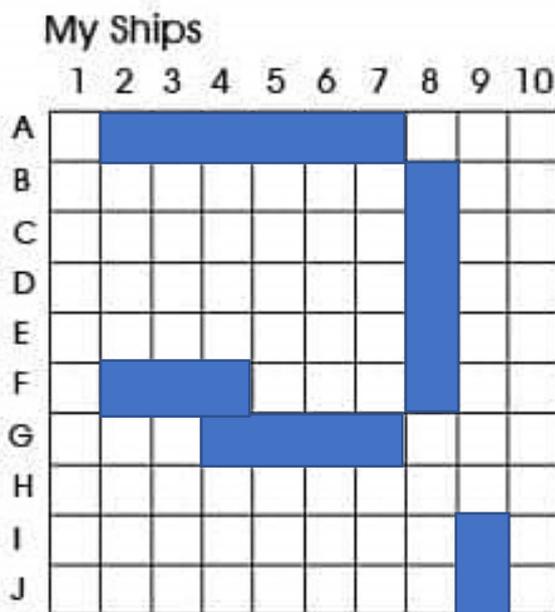
H = Horizontal, V = Vertical

Top/left co-ordinate of the ship is Caesar Cypher Shifted by one.

Information I would share to describe where my ships are:

AHB3, BVC9, CVH5, SHG3, PVJ10

Actual location of ships on grid:



What you need to hand in

1. An encryption key which describes the way your encryption system works
2. An example list of ship locations, encrypted using your scheme
3. A grid showing where those ships would be

What we will do with this

The best examples will be chosen for us to play in lesson in September. I will share the encrypted locations of all the ships with the class and your aim will be to figure out the encryption scheme so that you can work out where all the ships are!