*) The small project consists of 4 classes:

1. Cowboy
2. MD5CheckSum
3. Report
4. Simulation (this is the main class. Meaning when we run the code this one is going to give the results.)

*) Cowboy

This class has two properties and 4 methods of a cowboy:

1. Index of the cowboy
2. Health points (hp=10 by default)
3. Methods:
    a. Getters and setters

*) Report

This class has 4 properties and methods 8 methods for each required entry:

1. Who fired
2. Who was hit
3. Health points lost
4. Health points of the target
5. Methods:
    a. Getters and setters

*) MD5

This class has only two methods:

1. createChecksum
2. getMD5Checksum

*) Simulation

This class has only two methods and call the other classes:

1. getRandomNumber
2. runSimulationOfTheGame

TEST SCENARIO

We start with a circle that is represented as a connected list: (0->1->2->3->4->0) that represents the cowboys. Here, cowboy 0 shoots cowboy 4 (left) and cowboy 1 (right). In contrast, cowboy 4 shoots cowboy 3 (left) and cowboy 0 (right). In the case of middle cowboys (e.g. cowboys 1,2,3) they have their respective neighbors (e.g. cowboy 1 shoots to cowboy 0 (left) and cowboy 2 (right)). Likewise, cowboy 2 shoots cowboy 1 (left) and cowboy 3 (right). We start with cowboy 1 (randomly):

When we execute one test:

shoot number: 0
Who fired: 1
Who was hit: 0
Lost health points: 4
health points of the target has left: 6
==========
shoot number: 1
Who fired: 0
Who was hit: 4
Lost health points: 1
health points of the target has left: 9
==========
shoot number: 2
Who fired: 4
Who was hit: 0
Lost health points: 2
health points of the target has left: 4
==========
shoot number: 3
Who fired: 0
Who was hit: 4
Lost health points: 3
health points of the target has left: 6
==========
shoot number: 4
Who fired: 4
Who was hit: 3
Lost health points: 4
health points of the target has left: 6
==========
shoot number: 5
Who fired: 3
Who was hit: 2
Lost health points: 2
health points of the target has left: 8
==========
shoot number: 6
Who fired: 2
Who was hit: 1
Lost health points: 3
health points of the target has left: 7
==========
shoot number: 7
Who fired: 1
Who was hit: 2

Lost health points: 5
health points of the target has left: 3
==========
shoot number: 8
Who fired: 2
Who was hit: 3
Lost health points: 3
health points of the target has left: 3
==========
shoot number: 9
Who fired: 3
Who was hit: 4
Lost health points: 1
health points of the target has left: 5
==========
shoot number: 10
Who fired: 4
Who was hit: 0
Lost health points: 3
health points of the target has left: 1
==========
shoot number: 11
Who fired: 0
Who was hit: 1
Lost health points: 5
health points of the target has left: 2
==========
shoot number: 12
Who fired: 1
Who was hit: 0
Lost health points: 1
health points of the target has left: 0
==========
shoot number: 13
Who fired: 1
Who was hit: 4
Lost health points: 2
health points of the target has left: 3
==========
shoot number: 14
Who fired: 4
Who was hit: 1
Lost health points: 3
health points of the target has left: -1
==========
shoot number: 15
Who fired: 4
Who was hit: 2
Lost health points: 4
health points of the target has left: -1
==========
shoot number: 16
Who fired: 4
Who was hit: 3
Lost health points: 1
health points of the target has left: 2

==========
shoot number: 17
Who fired: 3
Who was hit: 4
Lost health points: 4
health points of the target has left: -1
==========
Writing JSON object to file :)

The md5CheckSum is:
1600b17a5e0ca4525407ad087637a94e

- For this test example, we have the winner cowboy is 3.
- When we write the json file (UTF-8) as the following format:

{"results": [

{ "whoFired": the index of the current cowboy.

"whoWasHit": the index of the target cowboy.

"lhPoints": the lost health points.

"lhPointsTarget": the left health points of the target.

}

]

}

In this part, we answer the last question according to logical and experimental reasons.

It is fair?

No, because of two reasons:

1) The cowboy who starts is not always who wins. In fact, in this test example, the winner was cowboy 3.
2) It could happen that a cowboy that does not shoot much could be even the winner. In this case, the cowboy 4 (5 times) did shoot more than cowboy 3 (3 times).