CS225 Homework 7

Hare and Hound: Requirements and Test Cases

Deliverables: You will deliver a single file containing requirements and test cases as described below.

Only electronic documents submitted via Canvas are acceptable. Hand written and scanned documents are not acceptable. Do not submit a hard copy of your assignment. Do not email your assignment to the course instructor or grader. Late assignments will not be graded.

Problem Description: You are to provide functional software requirements and test cases for the software application described below. Note: There is no GUI required for the software. Requirements and test case related to a GUI will not be graded.

A Hare and Hound race is any race in which one player (the Hound) chases another player (the Hare). For purposes of this assignment, the Hare and Hound game is a turn based game having one hare and one hound. Both are controlled by the computer, and use the following rules:

1. The game is played in turns. Both the Hare and Hound move simultaneously each turn.
2. Both the Hound and Hare move in a straight line during a single turn. They may move in any direction, as long as they meet the rules given below.
3. The Hare moves at a constant speed of 5 units/turn.
4. The Hare must move in a straight line for 3 turns, then randomly changes direction. The new direction is followed for 3 turns without turning, and a new random direction is chosen, and so on throughout the game. The initial direction of motion for the Hare is determined randomly.
5. The Hound may move at any speed from 0 to 8 units/turn. There is no restriction on speed changes for the Hound.
6. The Hound may change direction every turn, but may only change from -45 to +45 degrees. For example, if the Hound is currently moving at 90 degrees, then the Hound may go from 45 to 135 degrees in the next turn. There are no restrictions on the initial direction for the Hound.
7. Both the Hare and Hound start at the origin of the map (x, y) = (0, 0).
8. The Hare is given a three turn head start. The Hound does not move until the fourth turn of the game.
9. If the Hound is ever within 2 units distance from the Hare, then the Hound has “caught” that Hare and wins the game. If the Hound does not catch the Hare within 100 turns, then the Hare escapes and wins the game.
10. Anything not specified above is left to the programmer as a design choice.

Instructions: Provide the following for the Hound and Hare problem:

1. Three requirements. Notes: These are not user stories, but atomic and testable requirements. Do not provide requirements relating to a GUI or display.
2. Three test cases per requirement. Use the format provided in the project assignment.

Rubric: Per that grading rubric below.

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| **Deliverable** | **Points** | **Awarded** |
| 3 Requirements | 10 |  |
| 9 Test Cases (3 per requirement) | 20 |  |
| Totals | 30 |  |