**TABLA DE ESPECIFICACIÓN DEL PROBLEMA DE INGENIERÍA DE SOFTWARE, identificando los siguientes elementos**

**Miembros:**

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| CLIENTE | Snakes and Ladders Inc. |
| USUARIO | Clients of Snakes and Ladders Inc. |
| REQUERIMIENTOS FUNCIONALES | R1- Generate a board with n rows and m columns.  R2- Generate number of snakes and ladders.  R3- Show game grid and player position.  R4- Generate turn system.  R5- Generate dice roll and player displacement.  R6- Show snakes and ladders.  R7- Calculate the score of the winner of each game.  R8- Store the scores in a binary tree. |
| CONTEXTO DEL PROBLEMA | The famous company Snakes and Ladders Inc needs a program that simulates and allows playing the renowned game Snakes and Ladders. |
| REQUERIMIENTOS NO FUNCIONALES | * The grid must be modeled and implemented using linked lists. * It is not possible to use any array, or arraylist, or any Java collection in this program. * It is not possible to use cycles in this program. All iterations must be done using recursion. * All ladders and snakes must be modeled as connections between nodes of the linked structure. |

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| Nombre o identificador | Generate a board with n rows and m columns. | | |
| Resumen | The System must ask the player how many rows and columns he wants the game board to consist of. | | |
| Entradas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| column | int | Must be an integer |
| row | int | Must be an integer |
| Actividades generales necesarias para obtener los resultados | Multiply n rows by m columns. | | |
| Resultado o postcondición | The system creates the number of squares. | | |
| Salidas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| square | linkedList | Doesn’t apply |

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| Nombre o identificador | Generate number of snakes and ladders. | | |
| Resumen | The System should ask the player how many snakes and ladders he wants the game board to have. | | |
| Entradas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| ladder | int | It must be a number less than half minus two spaces of the total number of spaces on the game table |
| snake | int | It must be a number less than half minus two spaces of the total number of spaces on the game table. |
| Actividades generales necesarias para obtener los resultados | The number of snakes typed by the player must be created randomly on the game board, with restrictions such as the following: no ladder can start on square 1, no snake can start on square n x m, and no starting square or end of ladder or snake must match another start or end of ladder or snake. | | |
| Resultado o postcondición | The system generates the snakes and ladders in the game. | | |
| Salidas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| ladder | linkedList | Doesn’t apply |
| snake | linkedList | Doesn’t apply |

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| Nombre o identificador | Show game grid and player position. | | |
| Resumen | The system must show the squares of the game board starting in the lower left corner to the right inserting the direction in each row and in turn show the positions of the three players with their corresponding symbol. | | |
| Entradas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| Actividades generales necesarias para obtener los resultados | Choose the option to show the game table in the menu. | | |
| Resultado o postcondición | Show each box in square brackets and the position of each player. | | |
| Salidas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| gameBoard | String | Doesn’t apply |

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| Nombre o identificador | Generate turn system. | | |
| Resumen | The system must randomly generate a system of turns between the three players and continue with it until the end of the game | | |
| Entradas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| Actividades generales necesarias para obtener los resultados | Through a random assign a turn to each player. | | |
| Resultado o postcondición | The turn system of the game is generated. | | |
| Salidas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| turn | String | Doesn’t apply |

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| Nombre o identificador | Generate dice roll and player displacement. | | |
| Resumen | The system must generate a random number from 1 to 6, and depending on the number that comes out, move forward the corresponding number of boxes and in case of falling on a ladder, advance it or fall on a snake, move it back. | | |
| Entradas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| Actividades generales necesarias para obtener los resultados | Generate a random number from 1 to 6. | | |
| Resultado o postcondición | Generate the roll of the dice and move the player to the corresponding square. | | |
| Salidas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| dice | String | Doesn’t apply. |

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| Nombre o identificador | Show snakes and ladders. | | |
| Resumen | When the user chooses the option the system must display all the snakes and ladders on the game board, identifying the snakes with the capital letters of the alphabet and the ladders numbered from 1 to e (positioning the entrance and exit of the snake or ladder with the same letter or number as appropriate). | | |
| Entradas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| Actividades generales necesarias para obtener los resultados | The scores of the winners are stored in a binary tree. | | |
| Resultado o postcondición | Show the snakes and ladders game table. | | |
| Salidas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| snake | linkedList | Doesn’t apply |
| ladder | linkedList | Doesn’t apply |

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| Nombre o identificador | Calculate the score of the winner of each game. | | |
| Resumen | After having finished the game, the score of the player who has won the game is calculated using the formula: (600 - t) / 6. Where t is the elapsed time in seconds since the game began. And then the scores of the winners of each game are shown from highest to lowest. | | |
| Entradas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| Actividades generales necesarias para obtener los resultados | That a player has reached the n x m square and that the system has calculated the winner's score using the corresponding formula. | | |
| Resultado o postcondición | Show the scores from highest to lowest of the winners of each game. | | |
| Salidas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| scoreboard | String | Doesn’t apply |

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| Nombre o identificador | R8- Store the scores in a binary tree. | | |
| Resumen | The system must store the scores of the winners of each game in a binary tree. | | |
| Entradas | Nombre entrada | Tipo de dato | Condición de selección o repetición |
| Actividades generales necesarias para obtener los resultados | There must be at least one winner for your score to be stored. | | |
| Resultado o postcondición | The scores of the winners are stored in a binary tree. | | |
| Salidas | Nombre entrada | Tipo de dato | Condición de selección o repetición |