# SOEN 6011- SOFTWARE ENGINEERING PROCESS

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**ASSIGNMENT 5**

**Instructor: Nicolangelo Piccirilli**

GROUP 9

## Project – Tic-Tac-Toe Game

TEAM NAME: CHALLENGERS

TEAM LEADER: KUMARAN AYYAPAN RAVI

## Team Members:

| NAME | EMAIL ID | STUDENT ID |
|---|---|---|
| A R ASHIQUR RAHMAN | rahmanarashiqur@gmail.com | 27420668 |
| REENAL RANA | reenalrana9@gmail.com | 27326688 |
| KUMARAN AYYAPAN RAVI | kumaranayyappan10@gmail.com | 27285388 |
| MILIND RAVINDRA PUKALE | milind.ise@gmail.com | 27652887 |
| AAKASHDEEP SINGH JAHAGIRDAR | jakashdeep@gmail.com | 27728131 |
| JYOTSNA RANA | jyotsnarana91@gmail.com | 40013246 |
| ADITHYA SAJJANAM | adithya3838@gmail.com | 27723032 |
| ARUMUGAM SHANMUGAM | arumugam.dav@gmail.com | 40010992 |

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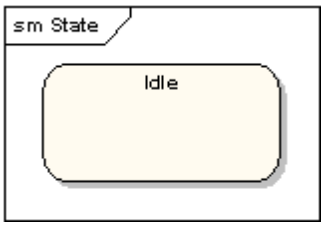
# 1. Purpose

After the domain diagram we are concerned about the state machine diagram of our game heuristics. The purpose of the document is to show the different states our game heuristics goes through when computer player attempts to beat human player.

A state machine diagram depicts the behavior of single object and the sequence of events that an object goes through during its lifetime in response to the events. A state diagram has different States, Transitions and Actions. A State diagram is represented by some of the following basic notations:

1. State
   Representation:




   A State of an object is depicted by rounded rectangle and shows the set of values of its attributes at some point of time.

2. Transition
   Representation:

   The arrow headed line denotes the Transition from one state to another state.

3. Initial State
   Representation:

   This represents the initial state of the object.

4. Final State
   Representation:

This represents the final state of the object. It has 2 circles with inner circle filled in it.

5. Decision
   Represenetation:

A choice psuedo state is represented by the decision node where one transition arrives and 2 or more leaves from there.

## 2 State Machine Diagram

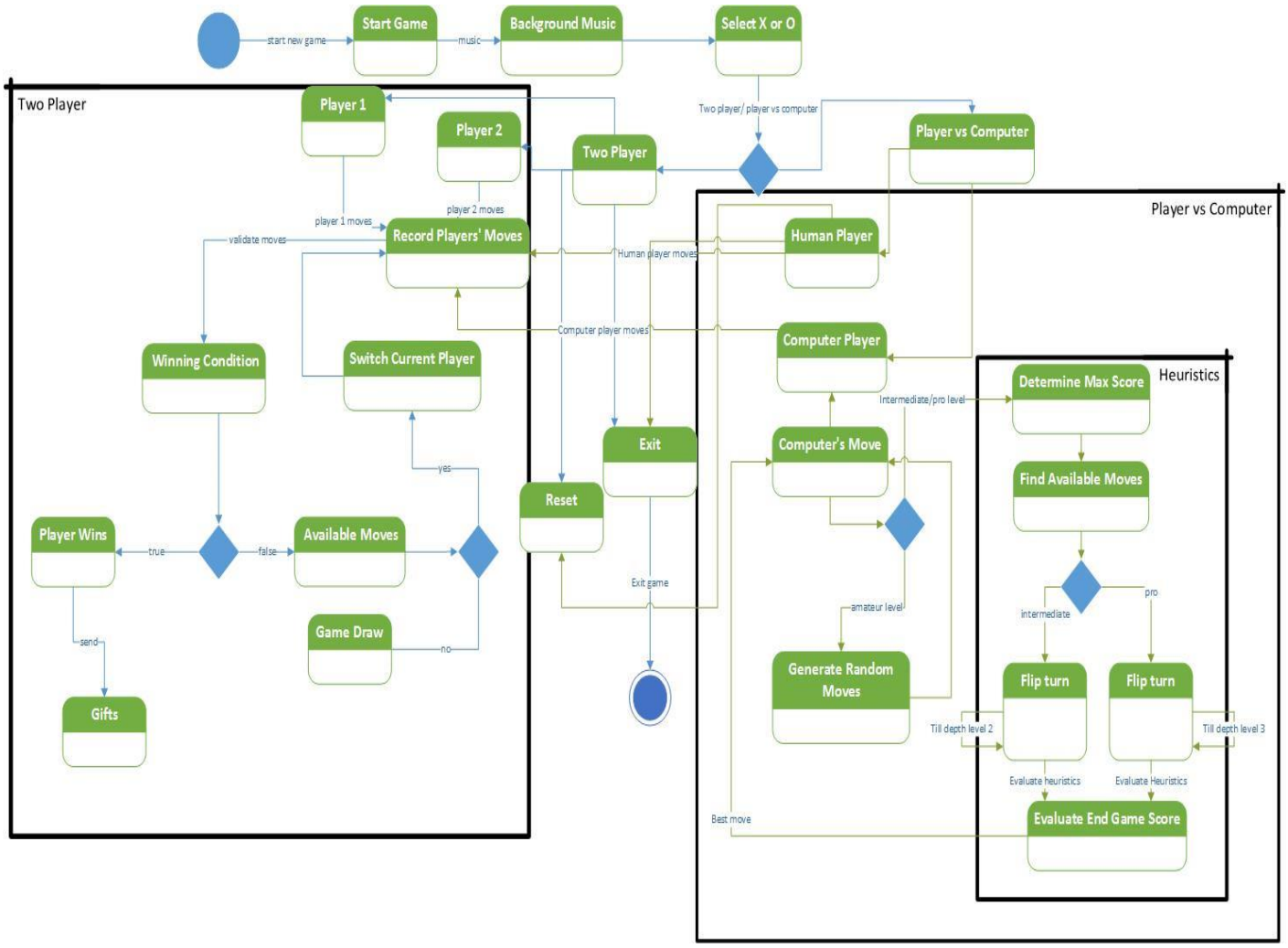


Fig: State Machine Diagram for Tic-Tac-Toe Game

## 2.1 Description

The Game starts when the user click on the launching icon of the game. The first state of the game is the Start Game state. Then state changes to start the background music. The user than will have to select the symbol X or O. The preference will be given to player 1. The second player and computer get the another symbol. User can select Two player or One player vs Computer scenario.

The two player scenario consist of the two players which plays their moves in loop. After each move the board is checked for the winning condition as well as the draw condition. If one of the player wins he is greeted with a message and also a random gift is given. If none of the moves are available than the game is declared draw. User can than reset the game or exit the game.

In One player vs Computer scenario, the player first need to select the level of the game. For the easy level we have used the random algorithm method. The amateur level is easy for the player to win. The medium and hard level uses the Minmax algorithm. For the medium level the computer sees for moves till depth of 2. For the hard level the computer sees the level till depth of 3. After every move the win condition is checked. If one of the player win, than he is greeted with the greeting message and a gift. The player can reset or exit game whenever he wants.

# 3. References:


1. https://www.edrawsoft.com/uml-statechart-symbols.php
2. http://www.sparxsystems.com/resources/uml2_tutorial/uml2_statediagram.html
3. “UML State Machine,” Wikipedia, 2016. [Online].
4. “Tic-tac-toe,” Wikipedia, 2016. [Online].
5. N. Piccirilli, Lecture Notes, Software Engineering Process-SOEN 6011, 2016.