

# GAMETOPIA

Gametopia, an arcade system with Hangman(word guessing) and Water/color match

# WELCOME TO OUR PROPOSAL

GROUP 14





# BACKGROUND AND MOTIVATION

**WATER SORT IS A POPULAR 1-PLAYER PUZZLE GAME WHERE PLAYERS HAVE TO SORT A NUMBER OF TUBES DEPENDING ON THE DIFFICULTY LEVEL, EACH TUBE STARTS WITH MIXED PORTIONS OF DIFFERENT COLORED SUBSTANCES AND THE PLAYER HAS TO MATCH EACH COLOR. ONLY 1,2 OR 3 TUBE(S) SHOULD BE EMPTY WITH THE REST FILLED WITH MATCHING COLORS AFTER A ROUND IN THE GAME. THE GAME CHALLENGES THE PLAYER TO PLAN THEIR MOVES CAREFULLY TO MATCH UP THE COLORS IN EACH TUBE. IT IS BELIEVED TO HAVE BEEN INSPIRED BY CLASSIC PUZZLE GAMES AND HAS SINCE BECOME A FAVORITE AMONG PLAYERS WHO ENJOY CHALLENGING AND ADDICTIVE PUZZLE GAMES. THE SIMPLIFIED VERSION OF WATER SORT AIMS TO MAKE THE GAME MORE ACCESSIBLE AND EASIER TO UNDERSTAND FOR PEOPLE WHO MAY STRUGGLE WITH COMPLEX INSTRUCTIONS OR LANGUAGE. BY BREAKING DOWN THE RULES AND BACKGROUND INFORMATION INTO SIMPLE LANGUAGE, MORE PLAYERS CAN ENJOY THE GAME AND HAVE FUN SORTING COLORS OF WATER IN THE TUBES. THIS VERSION ALSO HELPS YOUNGER PLAYERS, THOSE LEARNING ENGLISH AS A SECOND LANGUAGE, OR PEOPLE WITH COGNITIVE CHALLENGES TO ENGAGE WITH THE GAME AND IMPROVE THEIR PROBLEM-SOLVING SKILLS.**

**HANGMAN IS A WORD-GUESSING GAME WHERE THE PLAYER HAS TO CHOOSE LETTERS FROM THE ALPHABET TO BUILD UP A RANDOM WORD. THE NUMBER OF LETTERS IS THE HINT THAT COMES FROM A WARM HEART AND DEPENDING ON THE DIFFICULTY LEVEL, THE PLAYER WILL BE GIVEN 1,2,3, OR 4 OF THE LETTERS IN THE WORD THEY HAVE TO GUESS IN ORDER TO WIN.**

**HANGMAN IS A TRADITIONAL WORD GAME WITH ORIGINS DATING BACK TO THE 19TH CENTURY. IT IS BELIEVED TO HAVE ORIGINATED IN VICTORIAN ENGLAND AND HAS SINCE BECOME A POPULAR LEISURE GAME PLAYED BY PEOPLE OF ALL AGES. THE GAME HAS BEEN ADAPTED INTO VARIOUS FORMATS OVER THE YEARS, INCLUDING DIGITAL VERSIONS AND EDUCATIONAL VARIATIONS. THE SIMPLIFIED VERSION OF HANGMAN IS DESIGNED TO PROVIDE A CLEAR AND STRAIGHTFORWARD EXPLANATION OF THE RULES AND HISTORY OF THE GAME FOR ALL AUDIENCES, INCLUDING CHILDREN, ENGLISH LANGUAGE LEARNERS, AND INDIVIDUALS WITH COGNITIVE DISABILITIES. BY USING SIMPLE LANGUAGE AND EXPLANATIONS, PEOPLE OF ALL AGES AND BACKGROUNDS CAN EASILY UNDERSTAND HOW TO PLAY HANGMAN AND APPRECIATE ITS HISTORICAL SIGNIFICANCE AS A CLASSIC WORD-GUESSING GAME. THIS VERSION AIMS TO PROMOTE INCLUSIVITY AND MAKE THE GAME MORE ENJOYABLE AND ACCESSIBLE TO A WIDER RANGE OF PLAYERS, ENCOURAGING SOCIAL INTERACTION, CRITICAL THINKING, AND VOCABULARY DEVELOPMENT.**

# **RULES:**

- PLAYERS ARE PRESENTED WITH A SERIES OF TUBES FILLED WITH DIFFERENT COLORED WATER.**
- THE OBJECTIVE IS TO REARRANGE THE WATER IN THE TUBES SO THAT EACH TUBE CONTAINS ONLY ONE COLOR.**
- THE PLAYER CAN POUR WATER FROM ONE TUBE TO ANOTHER, BUT THEY MUST BE STRATEGIC ABOUT IT TO AVOID MIXING COLORS.**
- THE GAME IS COMPLETED WHEN ALL THE TUBES CONTAIN ONLY ONE COLOR.**

## **RULES:**

- ONE PLAYER THINKS OF A WORD AND TELLS THE OTHER PLAYER HOW MANY LETTERS ARE IN THE WORD.**
- THE OTHER PLAYER STARTS GUESSING LETTERS ONE AT A TIME.**
- FOR EACH INCORRECT GUESS, A BODY PART OF A STICK FIGURE IS DRAWN ON A GALLOWS.**
- THE GAME IS OVER IF THE STICK FIGURE IS COMPLETED BEFORE THE WORD IS GUESSED, OR IF THE PLAYER GUESSES THE WORD**

# PROBLEM STATEMENT



**THE AIM OF THE WATER SORT IS TO DISPLAY RANDOMLY MIXED SEGMENT COLOURS OF LIQUID IN EACH TUBE AND ALLOW THE USER TO MATCH UP EACH COLOR SEGMENT IN A SINGLE TUBE FOR EACH COLOR. THIS GAME HAS A LOW COMPLEXITY, WHICH WILL SURELY INCREASE AS THE GAME IS ENHANCED WITH FEATURES AND AESTHETICS.**

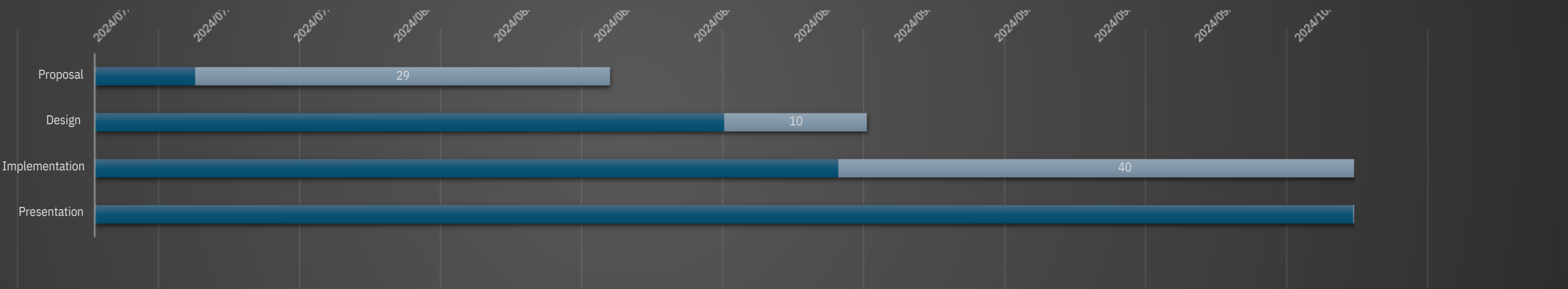
**THE HANGMAN GAME AIMS TO GENERATE RANDOM WORDS ACCORDING TO THE DIFFICULTY LEVEL SPECIFIED BY THE USER AND ALLOWS THE USER TO CHOOSE LETTERS FROM THE ALPHABET TO BUILD OUT THE GENERATED WORD. THE COMPLEXITY OF THE GAME IS LOW AS WE ONLY NEED TO ISSUE THAT THE RANDOM LETTERS FROM THE ALPHABET ACTUALLY BUILD UP TO MORE THAN 1 WORD.**

# APPROACH

**The water sort puzzle is similar to the ball sort puzzle. Each ball is replaced by colored water of a unit volume in the water sort puzzle. In the water sort puzzle, the rules (0) and (1) are the same as the ball sort puzzle except for one liquid property: Colored water units are merged when they have the same color and they are consecutive in a bin. When we pick up a source bin and move the top water unit(s) to a target bin, the quantity of the colored water on the top of the bin to be moved varies according to the following conditions. If the target bin has enough margin, all the water of the same color moves to the target bin. On the other hand, a part of the water of the same color moves up to the limit of the target bin if the target bin does not have enough margin.**

**THIS GAME HAS 1 PLAYER MODE HOWEVER, THE DIFFICULTY LEVEL WILL INCREASE AS THE PLAYERS PROGRESS TO HIGHER STAGES. THE DIFFICULTY OF THE WORDS TO BE GUESSED WILL ALSO INCREASE. THEREFORE A RANDOM WORD GENERATOR WILL BE IMPLEMENTED WHICH IS A SIMILAR ALGORITHM USED IN THE NUMBER GUESSING GAME BUT THE ONLY DIFFERENCE IS THAT WE ARE GOING TO RANDOMLY GENERATE WORDS IN THIS CASE. A GUI WILL BE IMPLEMENTED TO MAKE THE GAME MORE ATTRACTIVE. THE HANGMAN STATUE AND THE RANDOM WORDS GENERATED WILL BE DISPLAYED.**

Gantt chart for Game Topia



## GITHUB LINK

<https://github.com/users/mjmankgane/projects/1/views/1>

Apple Inc., 2024. Water Sort Puzzle - Sorting Game. [mobile app] Available at:  
<https://apps.apple.com/us/app/water-sort-puzzle-sorting-game/id1593801388>

One-to-One Education. (2016). Hangman Game. Retrieved from <https://www.one-to-one.ca/wp-content/uploads/2016/01/Hangman.pdf>

Theoretical computer science, (2023). Sorting balls and water: Equivalence and computational complexity.[Online] Available at:  
<https://www.sciencedirect.com/science/article/pii/S0304397523004711>





THANK  
YOU