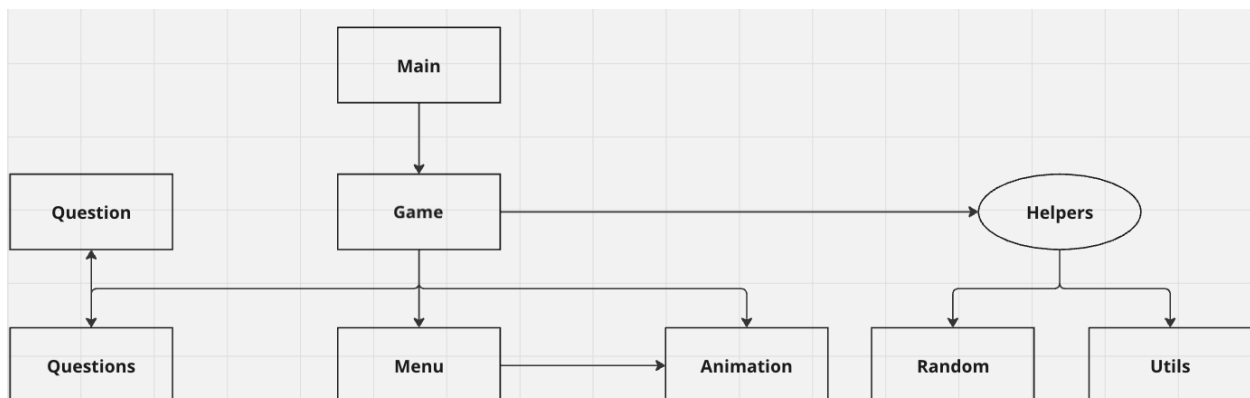


# Who Wants to be a Millionaire? – A Nand2Tetris Jack Project

## Concept:

Our project is based on the classic computer game "Who Wants to Be a Millionaire?", which combines trivia questions with cash prizes. The project includes a start screen from which the player proceeds to the main game. During the game, the player must correctly answer 10 consecutive trivia questions (from a pool of 50). A wrong answer will cause the game to restart.

## Project Architecture:



Here's a detailed breakdown of each class:

- **Main Class:**
  - A simple class with about 10 lines of code.
  - Its purpose is to run an instance of the Game class.
- **Game Class:**
  - Handles the core game logic, operations, and interactions between different screens, animations, and on-screen objects.
  - In the constructor, we initialize an instance of the Questions class (serving as a database) to access the 50 stored questions.

- We create an array called askedQuestions to track the questions presented to the player, preventing repeat displays.
  - The player's score is initialized to 0.
  - In the run method, the game loop runs and displays the start screen.
  - The time it takes for the player to press a key is used as a “seed” to send a unique number to the Random class, creating the impression of receiving random questions in each round.
  - After the player clicks "Play Now" on the start screen, the game screen is drawn.
    - The game screen includes a rectangle with the question text, four additional styled rectangles with the possible answers, and a right-side rectangle that acts as a score (money) gauge.
  - When the player clicks an answer, the game checks if the answer is correct.
    - If correct, the game continues: a random index is used to fetch a new question, which is displayed immediately. The player's score is updated, and the question is added to askedQuestions to avoid repetition.
    - If incorrect, a classic "game over" screen is displayed, offering the option to return to the start screen and play again.
  - If the player correctly answers 10 consecutive questions, they win, and the game ends.
- **Menu Class:**
    - Contains the home screen and buttons: "Play Now," "Instructions," and "Credits."
    - Navigation between screens is done using the "Enter" and "Escape" keys.
    - After each round (whether the player wins or loses), they are directed back to this screen.
  - **Question Class:**
    - Responsible for the structure of a question.
    - Contains the question text, an array of 4 possible answers, and a number indicating the index of the correct answer in the array.
  - **Questions Class:**
    - Generates an array of approximately 50 Question objects.
  - **Random Class:**
    - A helper class that takes a specific number, performs a series of calculations on it, and returns a random number derived from those calculations.

- **Utils Class:**
  - A utility class containing modulo and power functions.
  - Assists in the calculations needed for generating the random number obtained from the Random class.
- **Animation Class:**
  - This class handles all the work done with bitmaps, including the construction of rectangles for the question, answers, and the money gauge.
  - It also manages the creation of menu arrows and selection indicators for the questions.

## Motivation:

Our goal was to create a game that would be both complex and innovative, yet feasible within the short timeframe of a week and a few days. Initially, we started working on a Snake game, but during its development, we realized that creating a high-quality version required more time.

Additionally, the game is not innovative, with numerous similar versions already developed in the Jack language and available online.

We decided to make a significant "pivot" and abandon our progress so far in favor of a game that could be completed in a short time while still offering a worthy challenge.

During our search, we noticed that a trivia game in the Jack language either did not exist or had not been published online. Since both of us played the "Who Wants to Be a Millionaire" computer game in our childhood, the decision to develop such a game was made quickly.

Google drive link to our video showcasing the application:

[https://drive.google.com/file/d/1EPJzXCGgcFCZ1wCyZBYGTCKXnLJvyz\\_8/view?usp=sharing](https://drive.google.com/file/d/1EPJzXCGgcFCZ1wCyZBYGTCKXnLJvyz_8/view?usp=sharing)

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