

Team Alpha Class Diagram

```

classDiagram
    class VendingMachine {
        -text: Textures
        r: Random
        +VendingMachine()
    }
    class WaterBottle {
        r: Random
        -text: Textures
        +VendingMachine()
    }
    class Soda {
        -text: Textures
        +r: Random
        +Soda()
    }
    class Coin {
        -text: Textures
        +Coin()
    }
    class MainCharacter {
        -x: double
        -y: double
        -vX: double
        -vY: double
        -text: Textures
        +MainCharacter()
        +tick()
        +render()
        +getX()
        +getY()
        +setX()
        +setY()
        +setVelocityX()
        +setVelocityY()
    }
    class GameObject {
        +x: double
        +y: double
        +width: double
        +height: double
        +GameObject()
        +getBounds()
    }
    class Entity {
        <<interface>>
        +tick()
        +render()
        +getX()
        +getY()
    }
    class Controller {
        -e: LinkedList<Entity>
        ent: Entity
        r: Random
        -text: Textures
        +tick()
        +render()
        +addEntity()
        +removeEntity()
        +addVm()
        +addSoda()
        +addWb()
    }
    class waterGame {
        +WIDTH: int
        +HEIGHT: int
        +SCALE: int
        +TITLE: String
        -isrunning: boolean
        -thread: Thread
        -image: BufferedImage
        -spriteSheet: BufferedImage
        -bg: BufferedImage
        currently_shooting: boolean
        -mc: MainCharacter
        -c: Controller
        -text: Textures
        -menu: Menu
        +state: STATE
        -VmCount: int
        -VmKilled: int
        -SodaCount: int
        -WbCount: int
        -start()
        -stop()
        -memberName
        +initialize()
        +run()
        -tick()
        -render()
        +keyPressed()
        +keyReleased()
        +main()
        +getSpriteSheet()
        -memberName
    }
    class Textures {
        +mc: BufferedImage
        +coin: BufferedImage
        +vending: BufferedImage
        +soda: BufferedImage
        +water: BufferedImage
        -sprite: SpriteSheet
        +Textures()
        -getTextures()
    }
    class Menu {
        +playButton: Rectangle
        +quitButton: Rectangle
        +render()
    }
    class SpriteSheet {
        -image: BufferedImage
        +SpriteSheet()
        +grabImage()
    }
    class MouseInput {
        +mouseEntered()
        +mouseClicked()
        +mousePressed()
        +mouseReleased()
        +mouseExited()
    }
    class Kbinput {
        game: waterGame
        +Kbinput()
        +keyPressed()
        +keyReleased()
    }
    class BuffImageLoader {
        -image: BufferedImage
        +loadImage()
    }

    VendingMachine --|> WaterBottle
    VendingMachine --|> Soda
    VendingMachine --|> Coin
    VendingMachine --|> MainCharacter
    GameObject --|> Entity
    Controller --|> Entity
    waterGame "1" -- "1" Controller
    waterGame "1" -- "1" Entity
    waterGame "1" -- "1" waterGame
    waterGame "1" -- "1" BuffImageLoader
    waterGame "1" -- "1" Textures
    waterGame "1" -- "1" Menu
    waterGame "1" -- "1" SpriteSheet
    waterGame "1" -- "1" MouseInput
    waterGame "1" -- "1" Kbinput
    Entity ..|> Entity
    Entity ..|> Controller
    Entity ..|> waterGame
    Entity ..|> Textures
    Entity ..|> Menu
    Entity ..|> SpriteSheet
    Entity ..|> MouseInput
    Entity ..|> Kbinput
    Entity ..|> BuffImageLoader
    
```

The diagram illustrates the architecture of a game, organized into two main sections: Game Objects and Game Management.

Game Objects Section:

- VendingMachine** is the base class for **WaterBottle**, **Soda**, **Coin**, and **MainCharacter**. It has attributes `-text: Textures` and `r: Random`, and a method `+VendingMachine()`.
- GameObject** is the base class for **Entity** and **Controller**. It has attributes `+x: double`, `+y: double`, `+width: double`, and `+height: double`, and methods `+GameObject()` and `+getBounds()`.
- Entity** is an interface implemented by **Controller** and **waterGame**. It defines methods `+tick()`, `+render()`, `+getX()`, and `+getY()`.
- Controller** implements **Entity**. It has a linked list of **Entity** objects (`-e: LinkedList<Entity>`), a **Random** object (`r: Random`), and a `-text: Textures` attribute. Its methods include `+tick()`, `+render()`, `+addEntity()`, `+removeEntity()`, `+addVm()`, `+addSoda()`, and `+addWb()`.

Game Management Section:

- waterGame** is the central class that manages the game. It has attributes for dimensions (`+WIDTH: int`, `+HEIGHT: int`), scale (`+SCALE: int`), title (`+TITLE: String`), and game state (`-isrunning: boolean`, `-thread: Thread`). It also manages visual assets (`-image: BufferedImage`, `-spriteSheet: BufferedImage`, `-bg: BufferedImage`) and game elements (`currently_shooting: boolean`, `-mc: MainCharacter`, `-c: Controller`, `-text: Textures`, `-menu: Menu`). Its methods include `+state: STATE`, `-VmCount: int`, `-VmKilled: int`, `-SodaCount: int`, `-WbCount: int`, `-start()`, `-stop()`, `-memberName`, `+initialize()`, `+run()`, `-tick()`, `-render()`, `+keyPressed()`, `+keyReleased()`, `+main()`, `+getSpriteSheet()`, and `-memberName`.
- Textures** manages image assets, including `+mc: BufferedImage`, `+coin: BufferedImage`, `+vending: BufferedImage`, `+soda: BufferedImage`, `+water: BufferedImage`, and `-sprite: SpriteSheet`. It has methods `+Textures()` and `-getTextures()`.
- Menu** manages the game menu, with `+playButton: Rectangle`, `+quitButton: Rectangle`, and a `+render()` method.
- SpriteSheet** manages the sprite sheet, with `-image: BufferedImage`, `+SpriteSheet()`, and `+grabImage()` methods.
- MouseInput** handles mouse events, with methods `+mouseEntered()`, `+mouseClicked()`, `+mousePressed()`, `+mouseReleased()`, and `+mouseExited()`.
- Kbinput** handles keyboard input, with `game: waterGame`, `+Kbinput()`, `+keyPressed()`, and `+keyReleased()` methods.
- BuffImageLoader** loads image buffers, with `-image: BufferedImage` and `+loadImage()` methods.

Relationships:

- waterGame** has a 1-to-1 relationship with **Controller**, **Entity**, **waterGame** (self), **BuffImageLoader**, **Textures**, **Menu**, **SpriteSheet**, **MouseInput**, and **Kbinput**.
- Entity** has a 1-to-1 relationship with **Controller** and **waterGame**.
- Entity** has a 1-to-1 relationship with **Textures**, **Menu**, **SpriteSheet**, **MouseInput**, **Kbinput**, and **BuffImageLoader**.

