**Test Design – Gorillas**

Team Dank

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1. **Requirement**

**Functional Requirement**

**FN-IN-01:** System shall allow the player to enter an angle and velocity from the keyboard when prompted

**FN-IN-02:** System shall allow the players to enter a name for themselves (default “Player 1/2”)

**FN-IN-03**: System shall allow the players to choose how many points to play to (default 3 points)

**FN-IN-04:** System shall allow the players to adjust the gravity (default 9.8)

**FN-OU-05:** System shall output an intro screen, after all the settings have been set and the player hits ‘V’, that shows the gorillas dancing and display player names, before game actually starts

**FN-OU-06:** System shall start the gameplay and skip the intro screen, after all the settings have been set and the player hits ‘P’

**FN-OU-07:** System shall place the gorillas on the second or third building from the edge of the screen from their respective side

**FN-OU-08:** System shall randomly generate buildings and random height and width until across the entire x-axis of the screen

**FN-OU-09:** System shall display the player names in the top left and right corners of the screen respectively

**FN-OU-10:** System shall display the current score in the bottom middle of the screen

**FN-OU-11:** System shall display wind strength and direction with an arrow in the bottom middle of the screen

**FN-OU-12:** System shall signal player’s turn by displaying the angle and velocity input options underneath their respective player name. Left player always starts first.

**FN-OU-13:** System shall display a rotating banana, being thrown by the gorilla whose current turn it is, at inputted angle and velocity.

**FN-OU-14:** System shall display a small explosion upon banana impact with a building and remove a small portion of the building

**FN-OU-15:** System shall display a large explosion upon banana impact with a gorilla and remove the hit gorilla from the screen

**FN-OU-16:** System shall have a gorilla dance after the opposing gorilla has been hit by a banana

**FN-OU-17:** System shall display a game over screen with score and player names once the set maximum score has been reached

**FN-OU-18:** System shall display a sun with a face when creating the buildings

**FN-OU-19:** System shall temporarily change the sun’s expression if it is hit by a banana

**FN-PR-20:** System shall calculate the inputted angle and velocity with wind and gravity to determine the projection and landing spot of the banana

**FN-PR-21:** System shall keep track of the player's scores and end the game once the set maximum score has been reached

**FN-PR-22:** System shall determine building height and width before drawing them

**FN-PR-23:** System shall determine gorilla placement before drawing the gorillas

**FN-PR-24:** The system shall allow for two players.

**FN-PR-25**: The system shall be able to recognize collision between bananas and buildings and bananas and gorillas.

**Non-Functional Requirement**

**NF-IN-01:** The system shall not allow more games than the limit of 99 games.

**NF-OU-02:** The system shall remove all rendered graphics of an explosion after the explosion has passed.

**NF-OU-03:** The system shall not allow the user to scale the screen size.

**NF-OU-04:** The system shall not allow buildings to be built outside of the rendered screen.

**NF-OU-05:** The system shall adhere to the max-height allowance for a building when constructing the terrain.

**NF-PR-06:** The system shall handle any unexpected errors.

**NF-PR-07:** The system shall use a JAR executable file.

**NF-PR-08:** The system shall not affect any files other than its own on the user's system.

1. **Test Cases** 
   1. **Unit Testing**

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| Test Case #. | Req. # | Test Case Description | Input | Expected Output/Result |
| T01 | FN-IN-01 | Test that we can correctly input angle and velocity. This tests DoShot(). | Angle = 40  Velocity = 50 | Should return Angle = 40 and Velocity = 50 |
| T02 | FN-IN-02  FN-IN-03  FN-IN-04 | Players shall be able to enter a name for themselves, how many points to play to, and game gravity.  This tests the GetInputs method in the Intro\_Panel class. | Jonah  Steven  5  15.67 | Player 1 Name: Jonah  Player 2 Name: Steven  Best out of: 5  Gravity: 15.67 |
| T03 | FN-IN-02  FN-IN-03  FN-IN-04 | Makes sure that the defaults in the GetInputs method in the Intro\_Panel class work correctly. | Nothing since we are trying to get defaults. | Player Name: Player 1  Player Name: Player 2  Best out of: 3  Gravity: 9.81 |
| T04 | NF-IN-01 | Tests to make sure that the system doesn’t allow for more than 99 games to be played. | Player 1  Player 2  103 | Makes users reenter the number of games to be played |
| T05 | FN-OU-05 | Tests to make sure the transition from the Intro\_Panel class to the GorillaIntro\_Panel works correctly from the Intro\_Panel’s Exit method. | Keyboard input: V | Display the GorillaIntro\_Panel |
| T06 | FN-OU-05 | Tests that after the Intro\_Panel transition to GorillaIntro\_Panel that the VictoryDance method in the Gorilla class works correctly. | Keyboard input: V | Display dancing Gorillas on the GorrilaIntro\_Panel |
| T07 | FN-OU-06 | Tests that the system transitions from the Intro\_Panel class to the Game\_Panel class correctly from Intro\_Panel’s Exit method. | Keyboard input: P | Display the Game\_Panel |
| T08 | FN-OU-08  FN-PR-23  NF-OU-04  NF-OU-05 | Tests that the buildings are generated correctly once the Game\_Panel begins. This tests the MakeCityScape method in the Game\_Panel calss | Keyboard input: P | Display the Game\_Panel with generated Buildings with no buildings outside the Game\_Panel |
| T09 | FN-OU-07  FN-PR-24 | Tests that the gorillas are place on the second or third building from the edge of the screen from their respective sides when the Game\_Panel begins.  This tests the PlaceGorillas method in the Game\_Panel class | Keyboard input: P | Display the Game\_Panel with generated Buildings and both Gorillas drawn in the correct places. |
| T10 | FN-OU-09  FN-OU-10  FN-OU-11 | This tests that the player names display in the top left and right corners of the screen on their respective sides, and that the current score, wind strength and wind direction displays at the bottom middle of the screen when the Game\_Panel begins. Also tests that a sun with a face is displayed in the top center of the Game\_Panel screen. This tests the SetScreen method in the Game\_Panel class | Keyboard input: P | Displays the Game\_Panel with player names, score and wind strength and direction in the correct places |
| T11 | FN-OU-12 | This tests that it is the left player’s turn when the Game\_Panel starts.  This tests the PlayerTurn method in the Game\_Panel class | Keyboard input: P | Displays the Game\_Panel with angle and velocity input options underneath the left player |
| T12 | FN-OU-12 | This tests that the system changes to the right player’s turn after left player has inputted their angle and velocity.  This tests the PlayerTurn method in the Game\_Panel class | Angle: 40  Velocity: 40 | Displays the angle and velocity input options underneath the right player |
| T13 | FN-OU-12 | Tests that the system changes to the left player’s turn after right player has inputted their angle and velocity.  This tests the PlayerTurn method in the Game\_Panel class | Angle: 50  Velocity: 90 | Displays the angle and velocity input options underneath the left player |
| T15 | FN-PR-25 | Tests that collision occurs between a thrown banana and a building when the banana hits a building.  This tests the CollisionDection method in the Entity class. | Angle and Velocity inputs should be directed at a building | Building Collision: True  Gorilla Collision: False |
| T16 | FN-PR-25 | Tests that collision occurs between a thrown banana and a gorilla when the banana hits a gorilla.  This tests the CollisionDection method in the Entity class. | Angle and Velocity inputs should be directed at a gorilla | Building Collision: False  Gorilla Collision: True |
| T17 | FN-OU-19 | Tests that a thrown banana goes through the Sun.  This tests the CollisionDection method in the Entity class. | Angle and Velocity inputs should be directed to go through the Sun | Sun Collision: True  Sun changes its face to a surprised expression on the Game\_Panel |
| T18 | FN-OU-19 | Tests that a thrown banana does not go through the Sun.  This tests the CollisionDection method in the Entity class. | Angle and Velocity inputs should be directed to go away from the Sun | Sun Collision: False |

* 1. **Integration Testing**

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| Test Case # | Req. # | Test Case Description | Invoking Sequence | Expected Output/Result |
| I01 | FN-IN-01  FN-IN-02  FN-IN-03  FN-IN-04  FN-IN-05  FN-IN-12 | Testing the system displays player input onscreen and in all respective panels. | T01  T02  T04  T10 | Given input from the user is visible on the screen. |
| I02 | FN-IN-06 | Testing that the player can skip the introduction screen. | T05  T11 | Game screen begins before the gorillas begin dancing. |
| I03 | FN-OU-07  FN-OU-08  FN-OU-23  FN-OU-22  NF-OU-04  NF-OU-05 | Testing that generation of terrain and sprites are correctly placed. | T03  T08  T09  T10  T11  T12  T13  T14 | Terrain does not surpass the screen limits, and the gorillas spawn on the 3 building from the nearest edge. |
| I04 | FN-OU-09  FN-OU-10  FN-OU-11 | Testing that the system correctly updates player turn and name. | T08  T09  T10  T11  T12  T13  T14 | Arrow at the bottom of the screen is pointing towards the player whose turn it is, and player names are at the respective sides of the screen. |
| I05 | FN-OU-14  FN-OU-15  FN-OU-25  NF-OU-02 | Testing that when a banana collides with a destructible object, an explosion animation is played and the objects are destroyed. | T15  T16  T17  T18 | Explosion occurs upon impact, and after the explosion disappears both objects are gone. |
| I06 | FN-OU-15  FN-OU-25 | Testing gorillas dance after battle. | T05  T16 | Winning gorilla preforms a victory dance with a few repetitions before going the system continues. |
| I07 | FN-OU-14  FN-OU-15  FN-OU-18  FN-OU-19 | Testing that when the sun is hit by a banana, the expression on the sun changes. | T17  T18 | Once hit with a banana; the sun will have a surprised expression. |
| I08 | FN-OU-17 | Testing that the game over screen contains the game over screen with each players’ score and name once max score has been reached. | T05 | Once the max score has been reached; the game screen changes to one with each players; name and their score. |
| I09 | FN-IN-03  NF-IN-01 | Testing that the number of inputted games can be performed by the system. | T01  T02 | They system allows a player to continue with a number of games. |
| I10 | FN-OU-12  FN-PR-25  FN-PR-19 | Testing the inputting of the angle and velocity accurately throws banana given the angle | T12  T16  T17 | The banana flies through the map and creates a collision with something unless it lies outside the screen |
| I11 | FN-OU-05  FN-OU-06 | Testing that the panels accurately store the names and gravity and score of players between panels | T05  T07 | A transition of the game panels from main menu to intro to gorilla to game back to main menu |