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| Name of Bug | Dividing by zero in length |
| Author of Report | Alex |
| Date | 10/4/2019 |
| Path to Location of Bug | vector -> Vector -> setLength  vector -> Vector-> scale |
| Conditions | |  |  | | --- | --- | | Condition 1 | Length must be zero | |  |  | |  |  | |  |  | |
| Cause | There is an unchecked divide that causes an error when using the vector later. |
| Proposed solutions | |  |  | | --- | --- | | Add an exception | Throw an illegal argument exception when zero is given | | Default | If a zero is given set the vector to the zero vector | |  |  | |
| Chosen solution | Add an exception |

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| Name of Bug | Normalizing a vector with value of x and y component being zero |
| Author of Report | ChiaTse |
| Date | 10/11/2019 |
| Path to Location of Bug | vector -> Vector -> normalize() |
| Conditions | |  |  | | --- | --- | | Condition 1 | Both x and y components are 0 | |  |  | |  |  | |  |  | |
| Cause | The normalize() function does not check both the components of the vector being zero or not, therefore causing an error by dividing zero. |
| Proposed solutions | |  |  | | --- | --- | | Idea one | Check both x and y components of the vector first then decides whether to normalize the vector or not. | | Idea two |  | |  |  | |
| Chosen solution | Idea one |

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| Name of Bug | Set a bad angle (up) |
| Author of Report | ChiaTse |
| Date | 10/11/2019 |
| Path to Location of Bug | vector -> Vector -> setAngle() |
| Conditions | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |
| Cause | Inside the method setAngle() of Vector class, the constructor to create the new vector with new angle was set up incorrectly and missed its third parameter, boolean. (the 2 parameters were oppositely passed into the method) Therefore, the new vector was set up by the Cartesian Vector constructor. |
| Proposed solutions | |  |  | | --- | --- | | Correct the setAngle() method | Switch the first two parameters’ sequence and add the third parameter (boolean true). | |  |  | |  |  | |
| Chosen solution | Correct the setAngle() method |

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| Name of Bug | Set a bad angle (down) |
| Author of Report | ChiaTse |
| Date | 10/11/2019 |
| Path to Location of Bug | vector -> Vector -> setAngle() |
| Conditions | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |
| Cause | Inside the method setAngle() of Vector class, the constructor to create the new vector with new angle was set up incorrectly and missed its third parameter, boolean. (the 2 parameters were oppositely passed into the method) Therefore, the new vector was set up by the Cartesian Vector constructor. |
| Proposed solutions | |  |  | | --- | --- | | Correct the setAngle() method | Switch the first two parameters’ sequence and add the third parameter (boolean true). | |  |  | |  |  | |
| Chosen solution | Correct the setAngle() method |

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| Name of Bug | Set a bad angle (left) |
| Author of Report | ChiaTse |
| Date | 10/11/2019 |
| Path to Location of Bug | vector -> Vector -> setAngle() |
| Conditions | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |
| Cause | Inside the method setAngle() of Vector class, the constructor to create the new vector with new angle was set up incorrectly and missed its third parameter, boolean. (the 2 parameters were oppositely passed into the method) Therefore, the new vector was set up by the Cartesian Vector constructor. |
| Proposed solutions | |  |  | | --- | --- | | Correct the setAngle() method | Switch the first two parameters’ sequence and add the third parameter (boolean true). | |  |  | |  |  | |
| Chosen solution | Correct the setAngle() method |

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| Name of Bug | Boids missing over edge |
| Author of Report | McVay |
| Date | 10/12/2019 |
| Path to Location of Bug | boid->Boid->sight() |
| Conditions | |  |  | | --- | --- | | the boids difference in x | More than half the screen width | | The boids difference in y | More than half the screen height | |  |  | |  |  | |
| Cause | Because the distance function does not take into acount the wrapping edge of the world the calculated distance is less than the true distance |
| Proposed solutions | |  |  | | --- | --- | | Change distance | Change the distance function | | Change sight | Add if statements to sight to adjust the boids to be relative to each other | |  |  | |
| Chosen solution | Change sight |

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| Name of Bug |  |
| Author of Report | ChiaTse |
| Date | 10/11/2019 |
| Path to Location of Bug |  |
| Conditions | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |
| Cause |  |
| Proposed solutions | |  |  | | --- | --- | | Idea one |  | | Idea two |  | |  |  | |
| Chosen solution | Idea one |

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| Name of Bug |  |
| Author of Report | ChiaTse |
| Date | 10/11/2019 |
| Path to Location of Bug |  |
| Conditions | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |
| Cause |  |
| Proposed solutions | |  |  | | --- | --- | | Idea one |  | | Idea two |  | |  |  | |
| Chosen solution | Idea one |