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| Initialization | ~~When the Green Flag is pressed, the bird will begin in the middle of the screen~~ ~~(0,0). There will be no pipes visible on the screen~~. ~~Starting immediately, pipes will appear on the screen, with gaps through which the bird can move.~~ | 5 pts |
| Pipes | ~~Pipes will move across the screen from right to left. There will never be more than 2 sets (columns) of pipes visible on the screen at one time. Each new pipe that appears on the right hand side of the screen will have a different random location of the gap, but the gap will always be visible on the screen~~. | 20 pts |
| Bird movement | ~~The bird does not move on the X axis, only on the Y axis~~. It moves according to the rough gravitational model we discussed previously, i.e. for each iteration through the movement loop, the Y position will be adjusted by the current Y-velocity. In the absence of flaps, the bird will accelerate downward, i.e. their y-velocity will decrease (negative Y-velocity results in downward movement). When a flap is recorded, the bird’s y-velocity will instantaneously increase, propelling them upward. | 20 pts |
| Scoring | Scoring: Each time the bird travels through a gap, a point is recorded. The score should be displayed using sprites in the top center of the screen. The score should allow for at least three digits. | 10 pts |
| Dying | If the bird contacts any part of the pipe, it sinks slowly to the bottom of the screen. The score is displayed in the very middle of the screen. A button sprite appears below the score which causes the score to be reset, the bird to move back to the middle of the screen, and for the pipes to disappear. After a 2 second delay, the game begins again. | 10 pts |
| Flapping | All user input into the game will be via the Kinect. In order to flap the bird’s wings, the user will have to raise both their hands above their shoulders, and then lower their hands such that their arms are at a greater than 45 degree angle, relative to the x axis. See pictures for clarification. To be precise: The user will have to lift both their arms such that their hand is higher than their shoulder, then lower both their arms such that the angle defined by the line segment from their left shoulder to their left hand is between -135 degrees and -180 degrees. Similarly, for their right arm, the angle defined by the line segment between their right shoulder and their hand must be between 135 degrees and 180 degrees | 20 pts |
| Animation | ~~The bird will have one costume (wings up)~~ for when the arms are raised above the shoulder, ~~another costume (wings down)~~ for 0.3 seconds after the “flap” has been completed, ~~and a third costume (normal)~~ for the rest of the time. | 5 pts |
| Playability | Playability: Flappy Bird is a great example of a game where every little variable is set just right to make the game playability what it is. You need to do the same. For the game to be successful, it must be not too easy, not too hard. The test will be that an experienced Flappy Bird player will not be able to score higher than 50 the first three times they try to play the game, and they will be able to score 5 or more within the first 3 minutes. | 10 pts |
| Extra Credit Opportunities | Sound: Add sounds for points, flapping, and dying | 2 pts |
|  | Gliding: For as long as the user has their hands above their shoulders, the bird will “glide” which is to say that once their downward velocity reaches zero, their downward acceleration is reduced to a very small value. | 3 pts |
|  | Plummeting: For as long as the user’s hands are “inside” their shoulders (i.e. left shoulder x < left hand x and right shoulder x > right hand x), the bird will accelerate downward twice as fast as normal, up to a maximum (terminal) downward velocity | 3 pts |
|  | Flap force: The amount of upward velocity that a flap creates will be determined by the force of the flap. The force of the flap will be measured inversely by the amount of time from the moment the user begins the downward motion to the moment the arm is 45 degrees down from the X axis. | 3 pts |