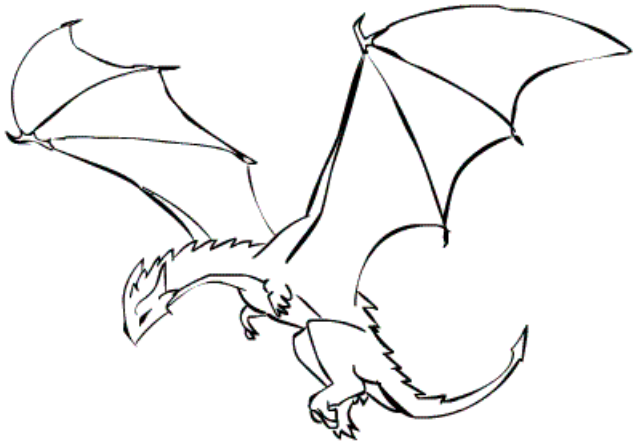
HiMCM

Team 7407

November 10, 2017



Contents

1 Summary

Aerial light shows are being investigated with increasing enthusiasm as the cost of acquiring and maneuvering sophisticated autonomous drones continues to drop. Our mayor has enlisted our help in examining the relative merits and drawbacks of incorporating this novel trend in an annual citywide festival. She would like a seamless performance that will amaze the public without stressing the financial and logistical infrastructure of the city. To that end, we devised a program of three intricate displays which make use of advanced algorithmic software to optimize the setup and execution of the spectacle.

Our analysis yielded two possible programs consisting of 300 and 500 of the most advanced aerial light show drones to date, respectively. From a simple and compact launch configuration comprising only approximately 30 square meters, the drones launch in corrals and follow flight paths determined by a recursive bipartite mapping algorithm to expedite the formation of spectacular crystal-clear images painted directly on the night sky. These flight paths drastically reduce the duration of transitions and eliminate the need to choreograph each drone's movements individually. The displays themselves will be rendered using a customized heuristic algorithm to generate easily discernible images of any complexity. These designs can then be animated to create fluid, living images dancing across the sky. After completing each performance with speed and precision, the drones will safely land themselves at their site of origin for easy cleanup.

Using our model, we were able to generate both simple geometric flight paths and complex maneuvers to project detailed images on a specially-developed i-j-k coordinate system placed at an optimal viewing angle to improve audience experience, ensure public safety, and conserve airspace. According to our model, the drones would be capable of executing all three displays in approximately 6 minutes, under half their maximum flight time of 20 minutes.

2 A Memo to the Mayor

Dear Mayor Swanson, Thank you for agreeing to hear our evaluation of the prospect of an aerial light show at the upcoming festival! We are excited to share our insights with you, and hope to make this year the best festival yet! Our research led us to the conclusion that there are two possible means of carrying out the drone show: using 300 drones or 500. The personnel cost for either option would be the same; a full fleet of drones can be programmed and maneuvered by a single pilot. However, the cost of a single Intel Shooting Star drone is approximately $1,000, so orchestrating a 500-drone show would cost approximately $200,000 more than a 300-drone show. Logistically, a show of any scale would necessitate a large, flat space from which to launch the drones and over which the performance should be held to minimize obstructions. Due to the compact size of the drones, the required launch area would be approximately only 30 square meters. Assuming a horizontal distance from the viewing area of approximately 213 meters, and taking into consideration the drones' advanced emergency mode self-landing capabilities, there is little risk posed to the public. That being said, in light of the exceedingly low personnel costs, we would advise that you enlist some city police to maintain the perimeter of the launch area and prevent any spectators from accidentally wandering into an area of danger.

In addition to the financial and logistical straightforwardness of putting together an aerial light show, the quality of the performance would be unparalleled. Sophisticated algorithmic path-finding software allows the drones to effortlessly navigate through space to quickly assemble complex and beautiful images in the night sky. Our proposed program comprises three displays of increasing intricacy executed within approximately 6 minutes – however, because the drones have a maximum flight time of 20 minutes, the displays could be repeated, or additional displays could be generated.

The spectacle will commence with all of the drones launching off the ground and flying in perfect harmony along predetermined paths to construct a rotating Ferris wheel in the sky. After the audience witnesses this dazzling display, they will be delighted to behold the sight of several hundred drones following a heuristic algorithm to create a glittering dragon soaring over the world beneath. The complex contour of the dragon's figure will be imitated using

a bipartite mapping algorithm that generates specific flight paths for each drone. Suddenly, the dragon will rapidly dissipate, making way for a fluid display of contemporary dance. As the celebration draws to a close, the drones will expertly make their way back to the launch site for simple, easy cleanup.

Based on the logistical ease of utilizing drones to create beautiful aerial displays, it is our recommendation that the city make use of this innovative technology in the next annual festival. The cost of acquiring the drones is certainly daunting, but it is worth considering that they are extremely versatile and could be reused for years to come. Compared to a standard fireworks display, aerial drones are superior in safety, reusability, and precision. As for the number of drones in the performance, we would recommend a 300-drone show if budget is your main priority, but the 500-drone show if you value superior display quality above all else. Please peruse the attached report for a more in-depth analysis of our research.

Sincerely, Team 4707

3 Introduction & Interpretation

Recent advances in autonomous drone technology make possible the creation of impressive and precisely choreographed aerial light shows in which a single operator can direct the entire fleet. However, the logistical and technical complexity of organizing such performances necessitates thorough preparation and clearly-defined objectives. Moreover, the novelty of this field permits extensive experimentation with different setups and designs.

The optimal solution to the problem will comprise efficient flight paths and effective drone placement, resulting in a high-quality performance appropriate to the financial means of a large city. In preparation for the spectacle, we must configure the drones on the ground in a manner that facilitates both the initial setup and the transition into the first display via optimized flight paths. To animate the images, we should employ strategic drone movements. Transitions between displays must be well-planned and expeditious. Other practical considerations such as safety precautions and duration of the performance require special consideration when demonstrating a new technology in a populous city.

4 Assumptions & Justifications

- Assumption: The performance will take place in negligible wind speeds and with no precipitation.
  Justification: The festival is an annual event and could be scheduled well in advance with a rain date.

- Assumption: The performance will take place over a level space free of anything that might obstruct the view.
  Justification: Because no specific venue is provided, it would be impractical to take specific obstructions into consideration.

- Assumption: All drones perform exactly as indicated in the specifications and will not malfunction during the performance.
  Justification: Creating an effective model while taking into account chance occurrences such as drone malfunctions in the time allotted would be unfeasible.

- Assumption: The highest-flying drone in the performance will fly at a maximum vertical height of 400 feet (121.92 m) above the ground.
  Justification: FAA regulations restrict commercial drone flight to a maximum height of 400 feet above the ground.

- Assumption: The drones will be a minimum of 700 feet (213.36 m) horizontally from the edge of the viewing area. Justification: This will permit a moderate 30-degree viewing angle above the horizon and ensure the safety of the spectators.

- Assumption: The drone LEDs are clearly visible from the viewing area.
  Justification: Intel has previously organized aerial light shows at a height of 700 feet above the ground with no obscured visibility.

- Assumption: If two drones' paths intersect in the two-dimensional plane of the performance, they will automatically move in three-dimensional space to avoid a collision.
  Justification: Modeling the motion of the drones in three dimensions would be signifi-

cantly more complex, but it is known that the drones have the ability to maneuver in three dimensions.

- Assumption: All drones used in the show will be launched prior to the moment when the first display is shown.
  Justification: It would be easier to direct the movements of the fleet without needing to coordinate additional launch sequences.

5 General Conditions

5.1 Safety

The distance of the display will help to ensure the safety of spectators. In addition, Intel Shooting Star drones are equipped with emergency mode features allowing them to land themselves in the event that they lose control or communication with the main operator. We would also advise that the mayor enlist the help of the city police force to maintain routine public safety protocols and prevent any onlookers from wandering past the designated viewing area.

5.2 Duration of Performance

The specifications restrict the flight of any one drone to 20 minutes. However, due to the limited number of displays and the highly efficient flight paths, the entire show can be run through in approximately 3 minutes and 50 seconds. Should the mayor desire it, any of the animations could be performed more than once to extend the performance.

5.3 Type of Drone

Prior to constructing a model, we conducted background research on various aerial drone models with respect to their cost, flight duration, weight, flight speed, programmability, and other factors. We determined that for the task of creating an aerial light show, the Intel Shooting Star is the most versatile and cost-effective model. It especially stood out in that

it contains built-in LEDs and has an emergency mode which allows it to land itself in the event that it can no longer contact the main operator.

5.4 Number of Drones

We evaluated the static initial dragon display as an array of between 100 and 500 points representing drone LEDs in the sky. We qualitatively examined the resulting images and determined the number of drones needed to create a display of adequate quality to be approximately 300. To develop a more comprehensive model, we evaluated an alternative scenario using approximately 500 drones, and we will present the two options with their relative merits and drawbacks. As a result of the high number of drones, we made the decision not to manually plot the points making up each display, but to use geometric shapes, existing images, and computerized algorithms to generate the positions of each drone.

5.5 Minimum Drone Spacing

As noted by a senior executive at Intel, Shooting Star drones can be operated with a minimum spacing of 5 feet between drones. To provide additional security, we determined that the drones must remain at least 2 meters from any surrounding drones.

5.6 Required Airspace

To present cohesive displays, we determined that the performance should take place in a plane tilted 30º towards the audience in accordance with the viewing angle. Considering the maximum height of the drones was 121.92 meters vertically above the ground, we calculated the height of the performance plane from the perspective of the spectators to be 140.78 meters, of which we excluded the bottom 20.78 meters to maintain an elevated display. The evaluation of the plane of the performance and the required airspace is illustrated in Figure 1 below. Figure 1 also contains the conversion from the x-y coordinate plane to the i-j coordinate plane; when simulating drone movement, the display was in the i-j coordinate plane. On a scale of 5 px: 1 m, then, a drone of dimensions 2x2 px would be perceived as having dimensions 2x1 px, as the drones are depicted in all simulations.

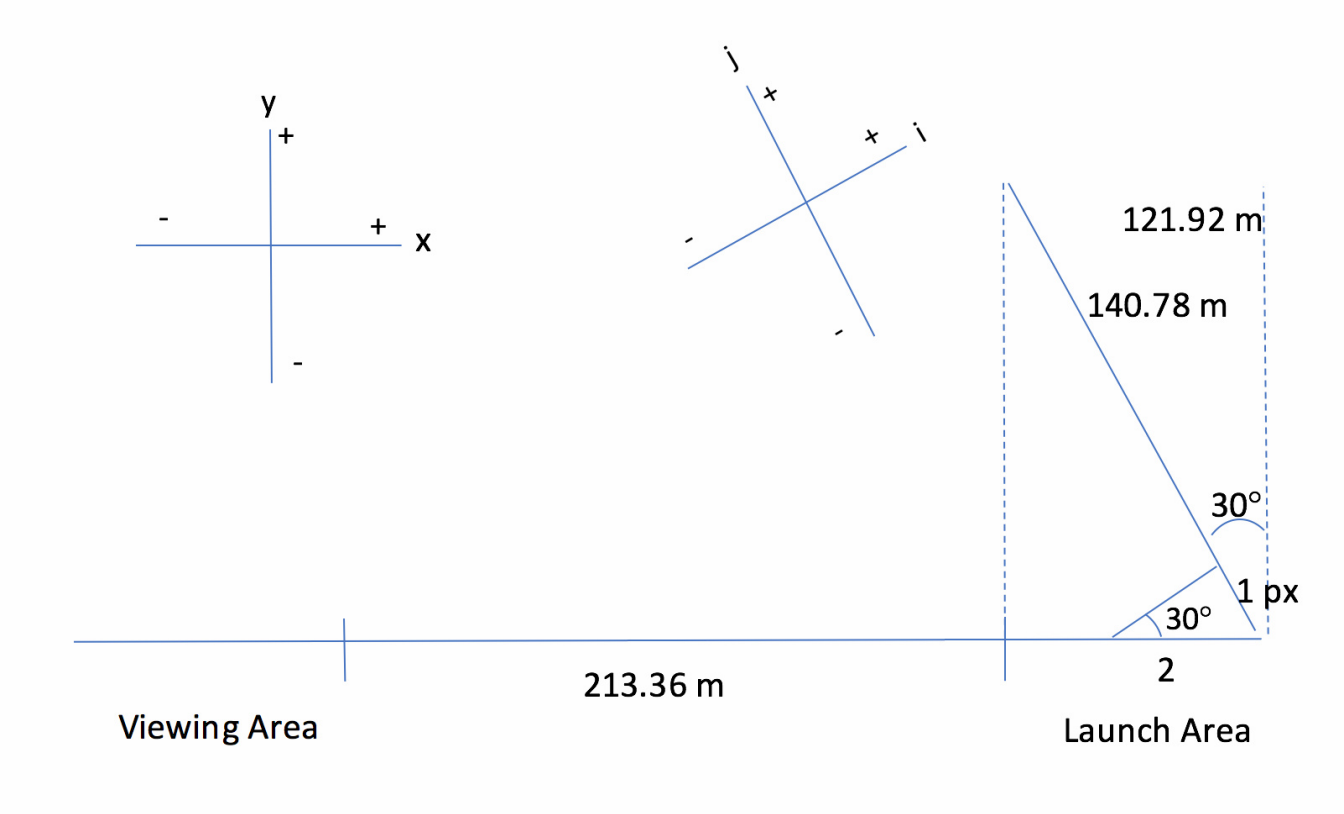


Figure 1: Side view of the festival grounds delineating viewing area and performance area. The i-j coordinate plane is the plane in which the drones will operate.

5.7 Ground Configuration

To optimize ease of setup as well as the transition into the first display, we determined that the drones should initially be laid out in arrays 100 drones long and 3 or 5 drones deep with negligible spacing between the drones, depending on the number of drones used in the performance. When the performance commences, each row will launch in sequence and in 5 corrals; every fifth drone in a row will launch in unison, every 1 second. According to the specifications, this will provide 3 meters of space and avoid collisions upon launch. In the simulation, we arranged the drones in three contiguous rows with 100 2x1 px adjacent rectangles in each row, as described in Section 5.6.

6 Display I: Ferris Wheel

6.1 Initial Static Image

To generate the initial image of the Ferris wheel, we first broke it up into its major constituent parts: the outer perimeter of the wheel, the spokes, and the triangular base. We simulated the positions of the drones using a Java Applet (Appendix B). We determined the numbers of drones in each constituent part based on visual appeal. More specifically, thorough qualitative analysis revealed that the clearest image was generated when the numbers of drones in each of the three parts were roughly the same, because this configuration emphasized the contrast between the components of the display. We then hard-coded these values into the Java Applet, and displayed them below in Table 1:

Part	300-Drone Model	500-Drone Model
Drones in Outer Wheel	100	165
Drones in Base (including center drone)	100	165
Number of Spokes	10	10
Drones per Spoke	10	17

6.1.1 Outer Circle

We generated the positions of the drones in the outer circle based on the equation for a circle:

$$x^2 + y^2 = r^2$$

We used this equation to generate a parametric equation for a point on a circle as a function of time:

$$P_t = (h + r\cos t, k + r\sin t)$$

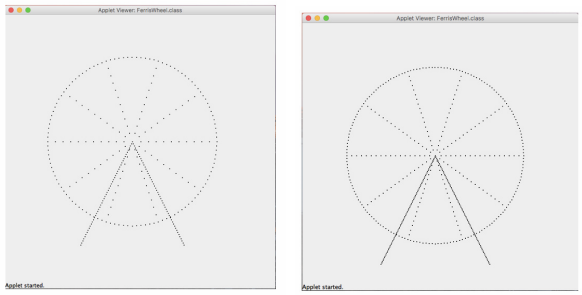
6.1.2 Spokes

The spokes of the Ferris wheel were composed of concentric circles of varying radii between the center and the outer perimeter of the wheel. We calculated the radius of each concentric circle based on a defined spacing and the radius of the outer circle. We hard-coded the number of spokes in the Java Applet based on aesthetic appeal, and the angle between the spokes based on the number of spokes. We hard-coded the number of drones in each spoke as well, and the drones were evenly placed along radii of the outer circle.

6.1.3 Triangular Base

The triangular base comprised two diagonal sequences of drones following the path of an equilateral triangle of side length 280 px. For each layer, we decremented the y-value of the drone position in the Applet by a spacing value which was directly proportional to the square root of three multiplied by half the side length of the triangle and inversely proportional to half the number of drones in the base. We respectively incremented and decremented the x-values for each diagonal sequence by a spacing value which was directly proportional to half the side length of the triangle and inversely proportional to half the number of drones in the base.

6.1.4 Ferris Wheel Initial Static Image



(a) (b)

Figure 2: Visual representation of Ferris wheel initial static image with 300 drones (a) and 500 drones (b)

6.2 Flight Path from Ground to Ferris Wheel

Once the we generated the static image of the initial Ferris wheel, the flight paths of the drones from the launch area to their respective locations in the display were determined. To accomplish this, we developed a recursive bipartite mapping algorithm to consider all possible distances each drone could travel and select the final position for each drone such that it minimized the overall transition time. We determined the optimal final positions by selecting the median of all possible distances and eliminating all longer paths; then, the program tested the remaining distances to evaluate whether each drone was paired with exactly one final position. If this was the case, the algorithm repeated the same sorting process on the first half of the list of distances, repeating until no more effective mapping could be found. Had no effective mapping been found in the initial search, the algorithm would have sorted the half of the list containing the longer distances. The mapping algorithm also allows the effective measurement of the duration of any one phase of the performance; we could calculate the time when the animation will be fully complete by dividing the length of the longest flight path by the drone speed.

6.3 Ferris Wheel Animation

The objective was to create a rotating wheel about the center of the Ferris wheel while keeping its base stationary. We generated the new locations of each drone by incrementing the value of the angle in the aforementioned calculations to generate new coordinates. This procedure allowed for the creation of an array comprising all vertices of the n-sided polygon which we used to approximate the Ferris wheel's outer circle, where n is the number of drones in the outer circle. Each drone would follow a straight-line path from its original position to the next position. Because we did not know the precision of the drones' navigation system is unknown, we could not determine precisely the optimal magnitude of the angle increment, so we generated a list of possibilities. We calculated the duration, s, of each transitional period, meaning the time it takes for every drone to shift along one position, using the following formula:

$$s = \frac{40}{3}\sqrt{2(1-\cos\theta)}$$

Where θ represents the angle increment in a clockwise direction from the previous position and 15 represents the distance travelled per second by a drone in pixels according to the simulation (See Appendix B for full derivation). From this equation, we determined that we could maximize the quality of the animation by minimizing the value for θ because this would minimize transition time and increase fluidity. We created a functional animation in a Java Applet, the corresponding code to which is listed in Appendix B. The duration of the Ferris wheel animation from the moment the first drone was launched to the completion of one full animation cycle, as calculated with the mapping algorithm in Section 6.2, was 131 seconds: drone launch took 47 seconds and one full rotation of the wheel took 84 seconds.

7 Display II: Dragon

7.1 Initial Static Image

Because a dragon is a geometrically irregular shape and would be difficult to manually animate, we retrieved a .gif file depicting the outline of a dragon flapping its wings using Google Images. We split the .gif file was split into 12 .png files, which we then imported into Microsoft Paint and saved as .bmp files. We then developed a heuristic algorithm to recreate the images using a specified number of pixels representing the allotted number of drones. This algorithm created a continuous line from one pixel to the nearest surrounding pixel for the entire image. We then selectively deleted the ordered pixels to generate a map of ideal drone positions to present the image in an aerial display (see Appendix B for code).

7.2 Flight Path from Ferris Wheel to Dragon

To generate efficient flight paths from the final position of the Ferris wheel to the initial static image of the dragon, we utilized the same mapping algorithm from Section 6.2. We decided to use the same algorithm because given an array of drone positions, the algorithm

simply calculates the optimal route for each drone to create the desired array of positions for the same set of drones; it is not specific to the creation of the initial aerial configuration.

7.3 Dragon Animation

To generate flight paths between the 12 frames of the animated dragon, we employed the same algorithm from Section 6.2 between consecutive frames. At first, we were uncertain of the quality of the paths the algorithm proposed, because the algorithm functions best with more frames. To verify that the dragon would retain its shape during transition periods, we generated intermediate images by calculating the midpoint of each drone's linear flight path between two consecutive frames and displaying the image of the drones at those positions. Because the shape of the dragon was still clearly discernible, we determined that the algorithm was an acceptable means of animating the dragon (see Appendix A). We calculated the duration of the transition from the Ferris wheel to the dragon to be 15 seconds, and the dragon animation was 49 seconds long.

8 Display III: Dancer

8.1 Initial Static Image and Flight Path from Dragon to Dancer

To create the design for the third display, we retrieved a .gif file depicting a break-dancing figure from Google Images and split into 14 frames. We then rendered each frame into a pixelated approximation with 300 and 500 drones using the same heuristic algorithm from Section 4.1. To generate the flight paths for each drone during the transition into the final display, we employed the mapping algorithm from Section 6.2 once again.

8.2 Dancer Animation

After converting each of the 14 frames to planes depicting the locations of each drone, we used the mapping algorithm from Section 6.2 during each transition to generate drone flight paths. As well as with the dragon, we simulated intermediate frames by calculating the midpoint of each drone's flight path between any two consecutive frames and evaluating

whether the dancer was still discernible. We concluded that though the algorithm may have provided more optimal flight paths if more frames were rendered, the animation was still clearly recognizable. The duration of the transition between the dragon and the dancer was 13.2 seconds, and the full dancer animation could be completed in 100 seconds. Finally, the drones required 42 seconds to reach the ground from the dancer configuration.

9 Discussion and Conclusions

9.1 Model Analysis

9.1.1 Heuristic algorithm

When converting an image to an array of points, the heuristic algorithm proved to be most effective tool for creating high-fidelity imitations. When compared with another algorithm which ordered points based on their location on the screen, the heuristic model yielded a far clearer image; the concentration of points along the outline of the image remained fairly constant, whereas the product of the other algorithm showed numerous clusters as well as gaps in the image. We show a side-by-side comparison of the two algorithms' outputs given the image of a dragon in Figure X. However, the algorithm is limited in that it is restricted to image outlines. Another caveat is that due to the structure of the program, it sometimes prints one less than the specified number of drones. Because this discrepancy is so small relative to the number of drones, we determined that the impact of this error would not seriously skew the results of the model.

Figure 3: Left: Good dragon; Right: Bad dragon

9.1.2 Recursive Bipartite Mapping Algorithm

Because the algorithm only generated linear flight paths between frames, the fluidity of the animations increased as the number of frames increased, or, alternatively, as the length of the flight paths decreased. We also saw this in the analysis of the optimal degree increment when rotating the Ferris wheel; a smaller increment resulted in a shorter path and a more fluid animation. Had more time been available, we could have refined the program to include considerations for the physical and aerodynamic characteristics of the objects in motion. Another possible means of improving upon the algorithm could be to shift the location of the displays with respect to the plane of performance such that during a transition, more drones would already be closer to their target locations. However, based on the animated display of the dragon, the algorithm seemed to have caused no major loss of image fidelity or clarity.

9.2 Conclusions and Future Extensions

The model we described above allowed the organization of a successful aerial light show displaying a Ferris wheel, a dragon, and a break-dancer using 300 or 500 drones. We were able to directly calculate the flight paths by breaking up simple displays into geometric shapes, or we could generate them using the mapping algorithm. The performance would

require minimal launch space and would pose minimal safety risks. Future iterations of the model could include a more sophisticated algorithm to determine flight paths which take into account the aerodynamic characteristics of the drones, as well as other complicating factors such as weather. We could also implement the model in different environments such as over a city or rough terrain. Other future considerations could include contingency plans in the event that a drone malfunctioned during the performance.

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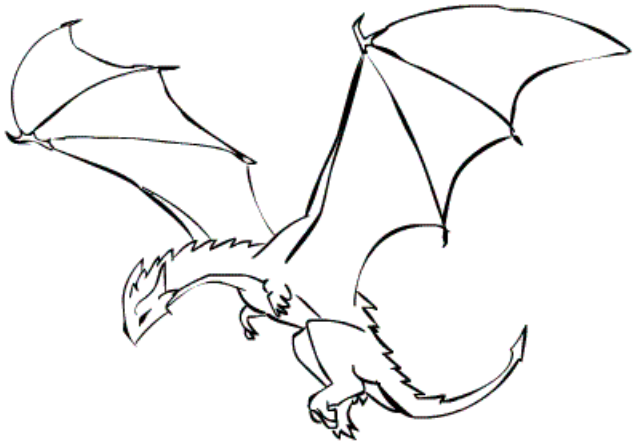
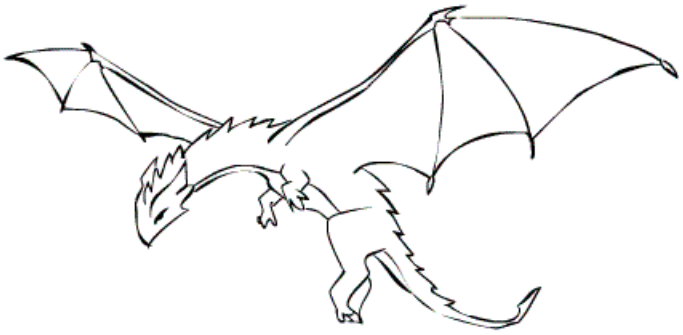
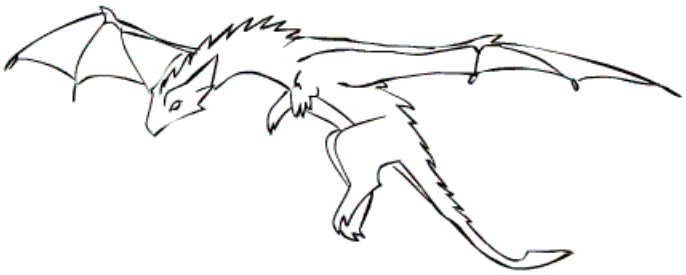
Appendix

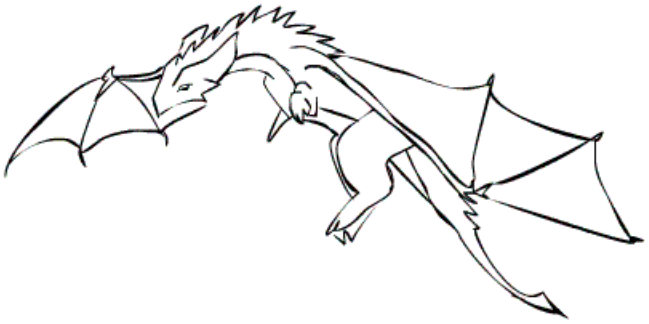
A Images

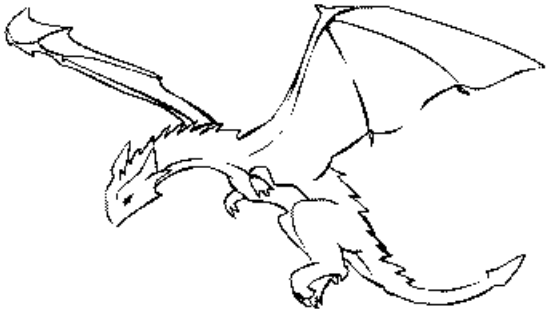
A.1 Dragon

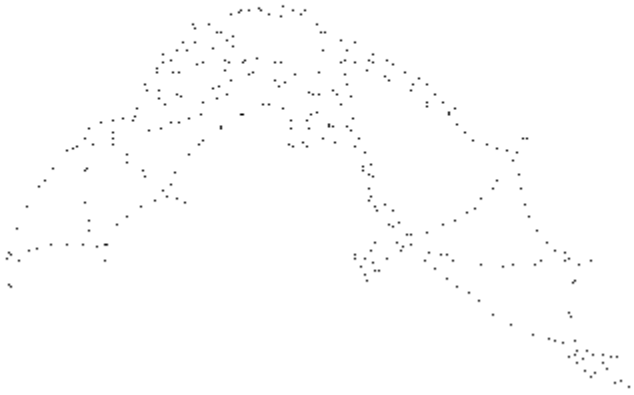


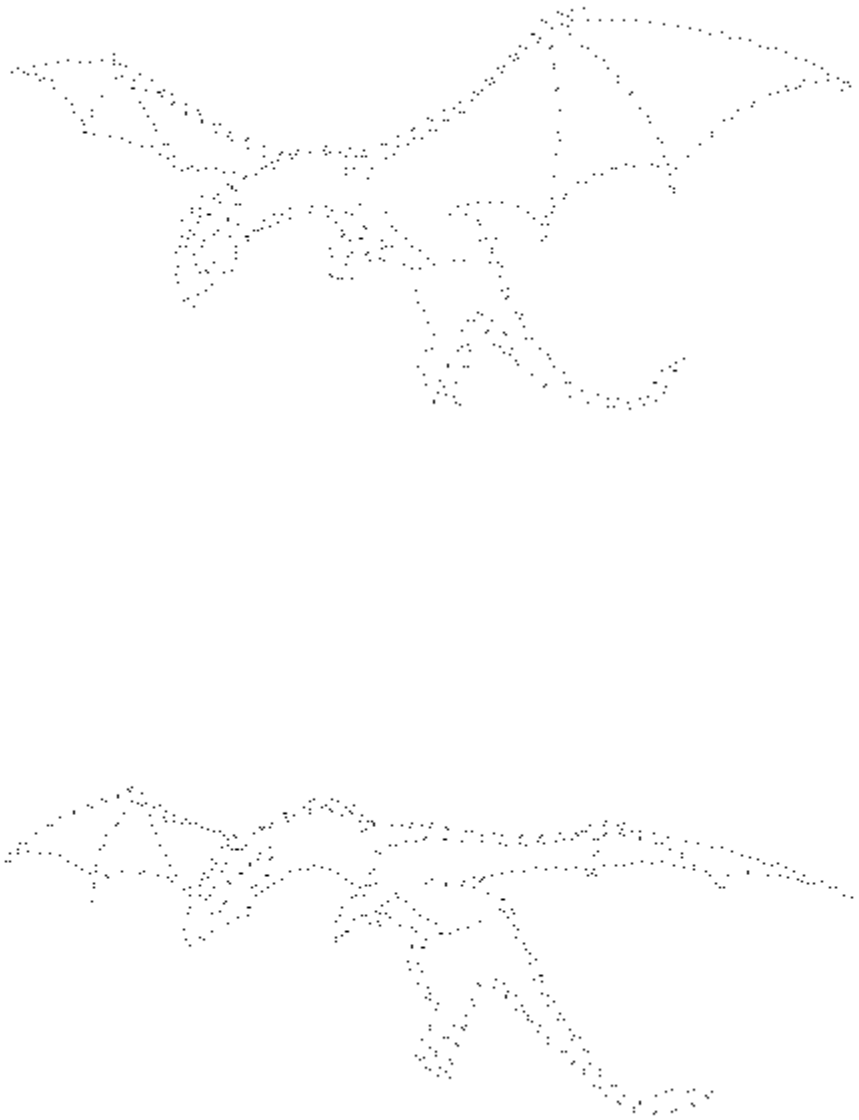


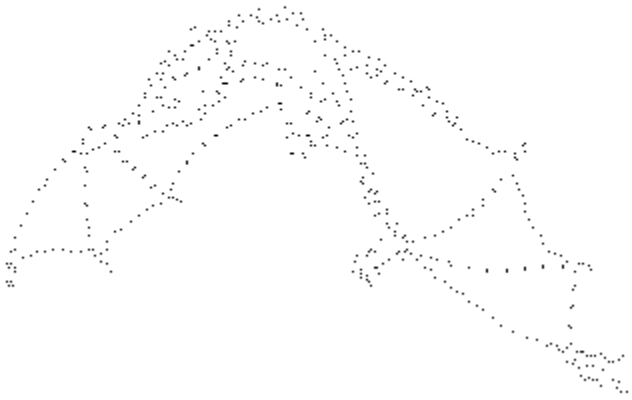


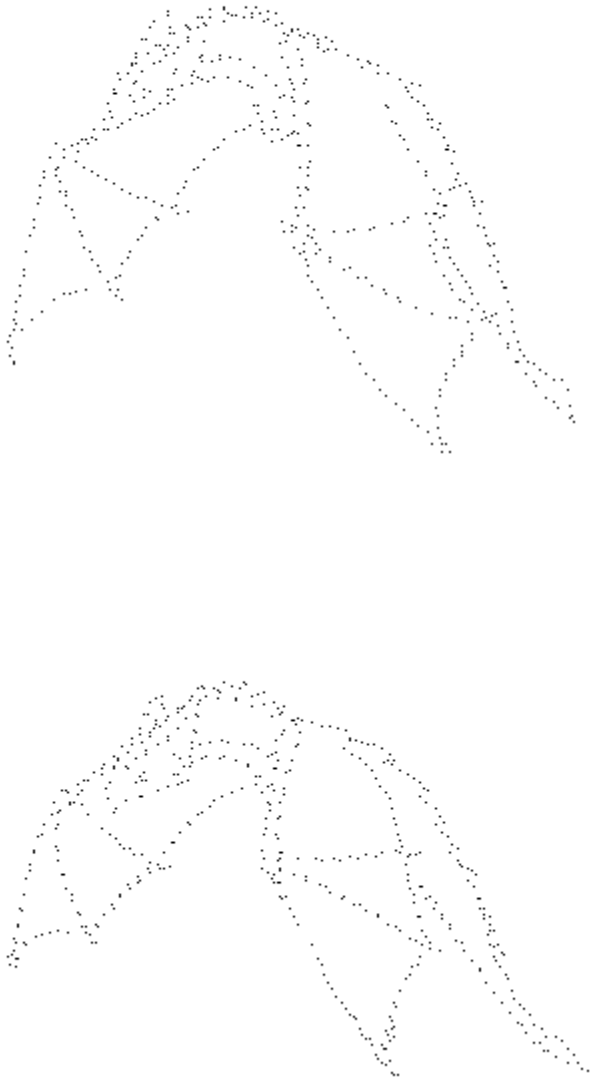


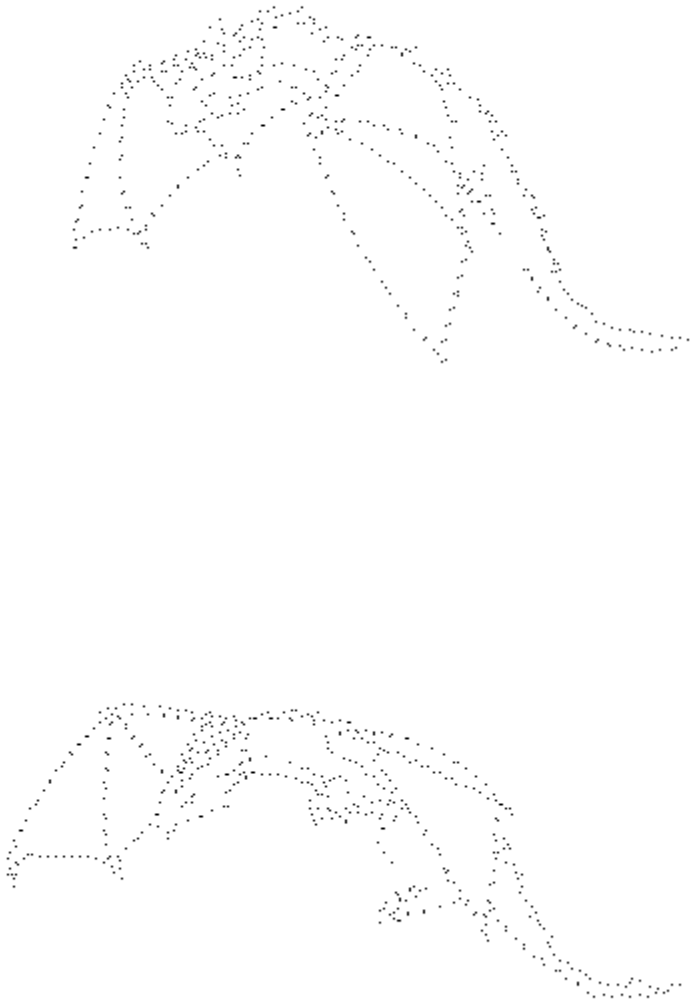


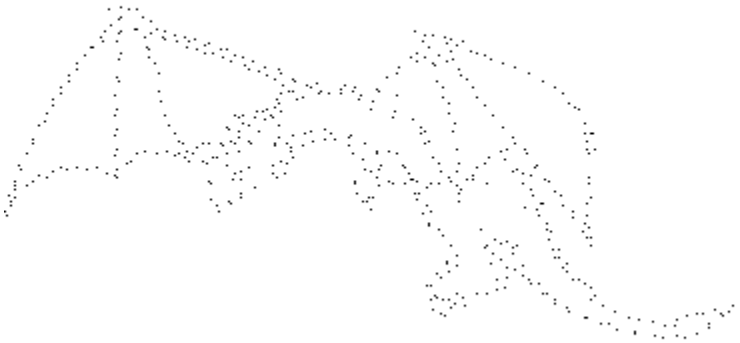


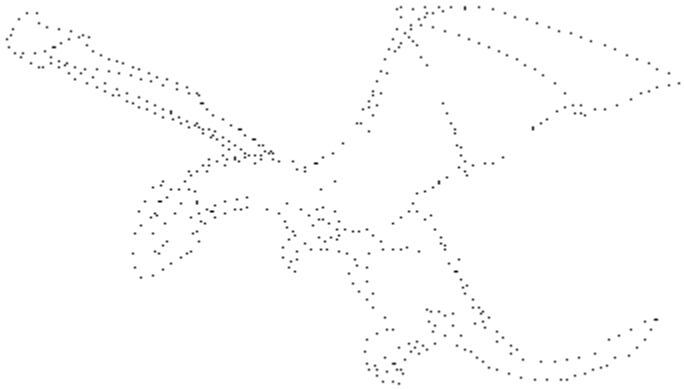




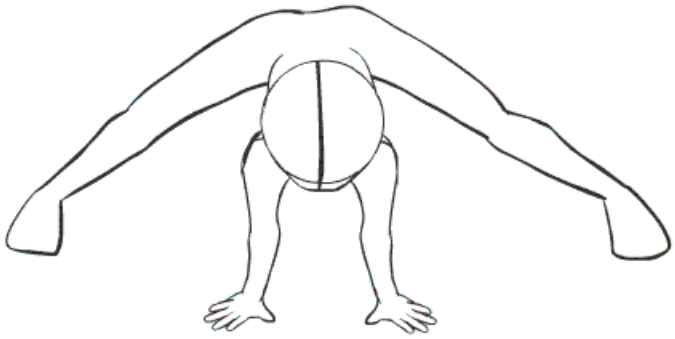


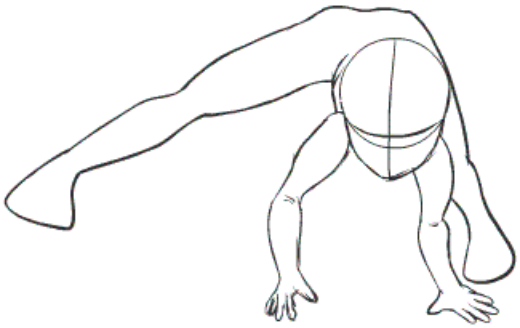


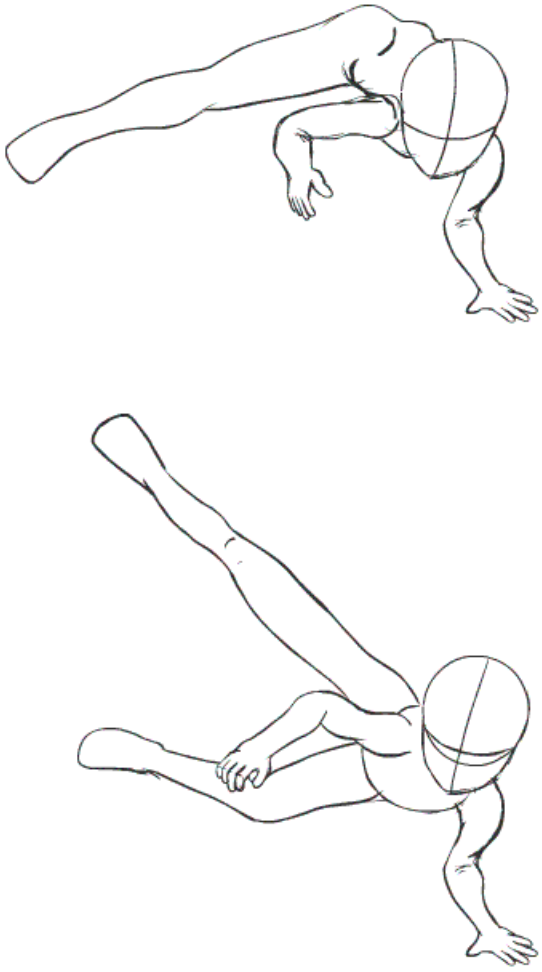


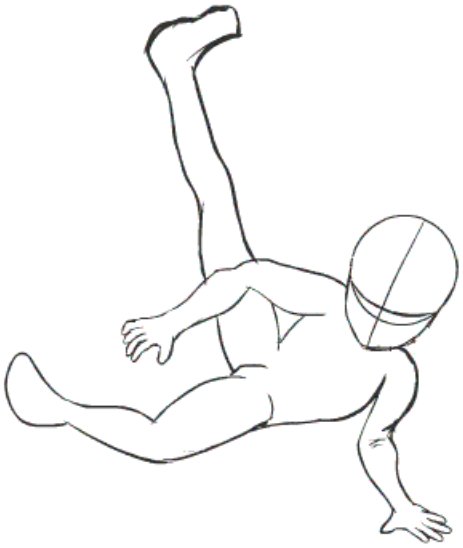


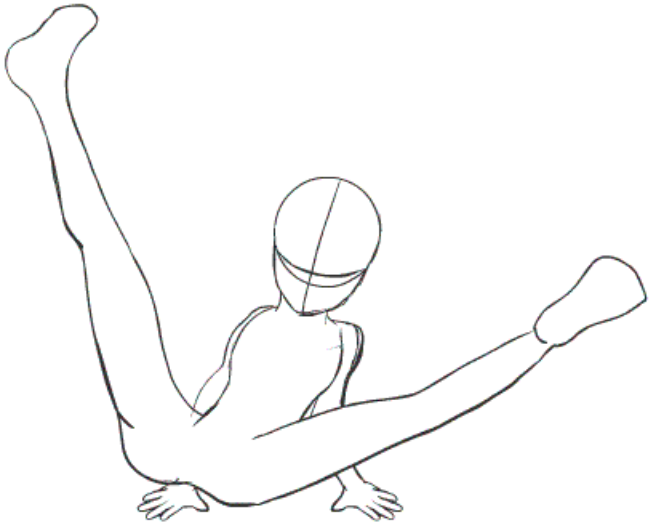
A.2 Break Dancer

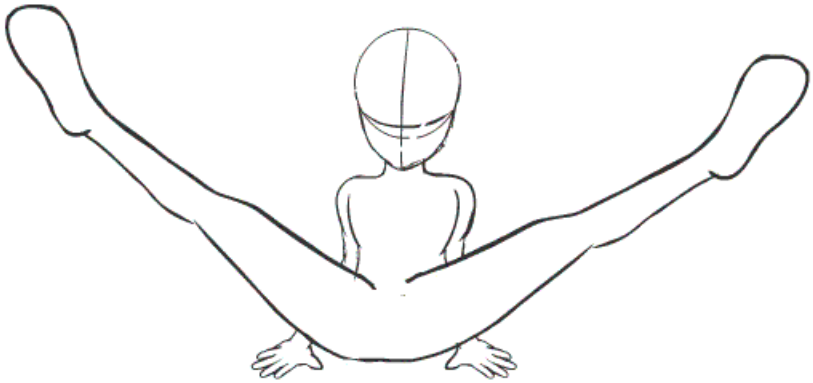


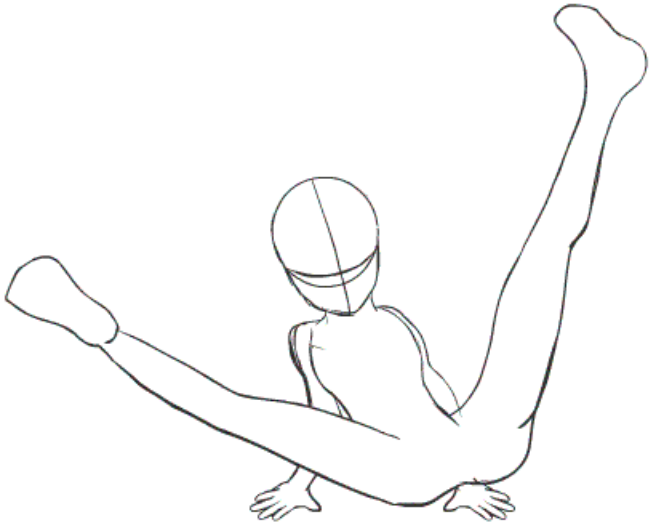


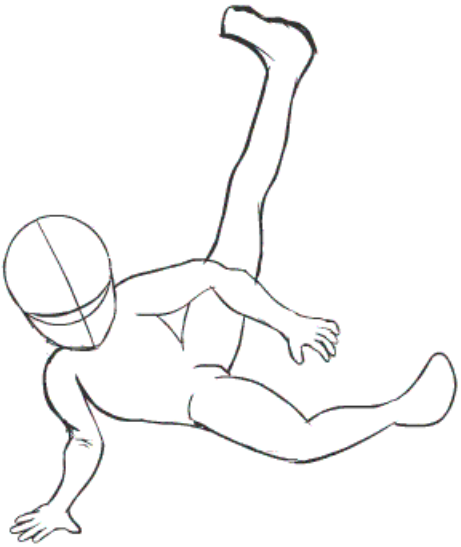


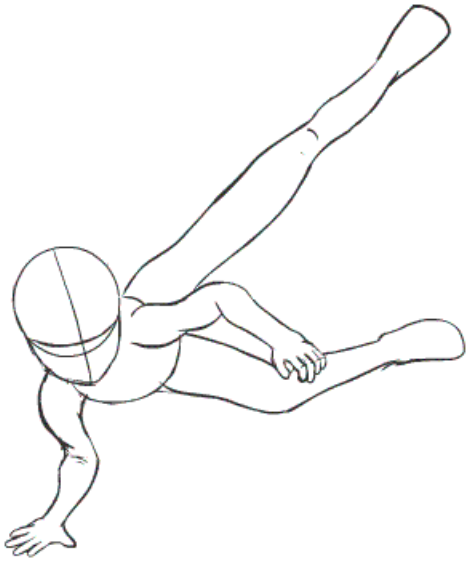


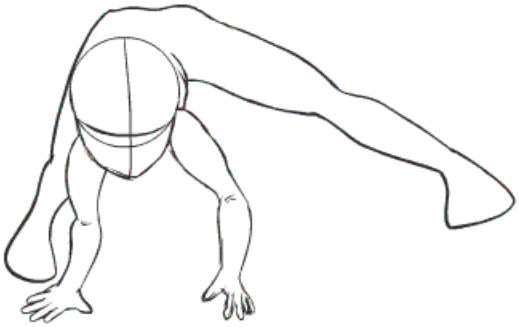


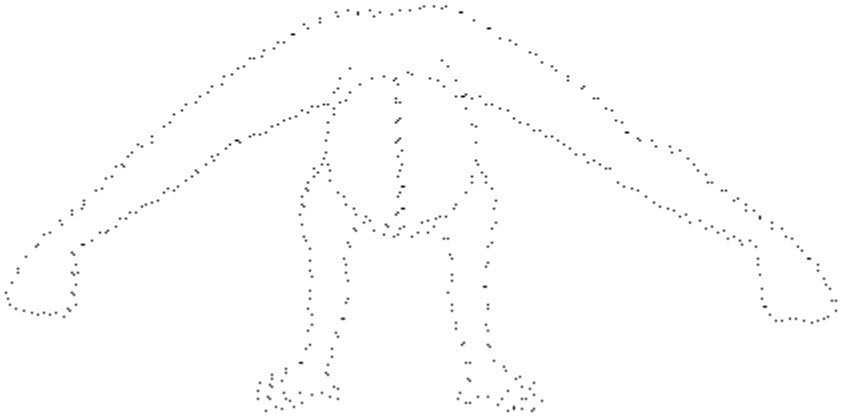


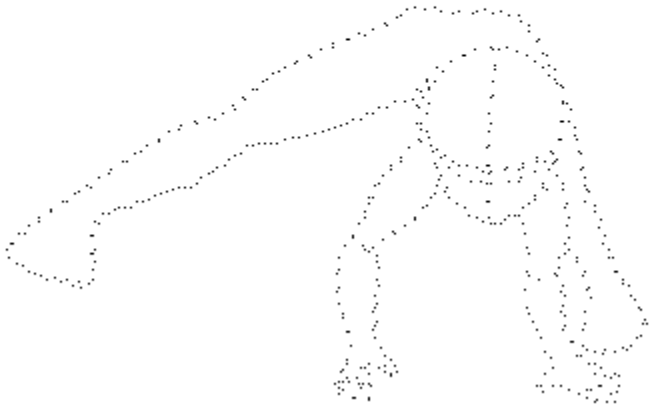


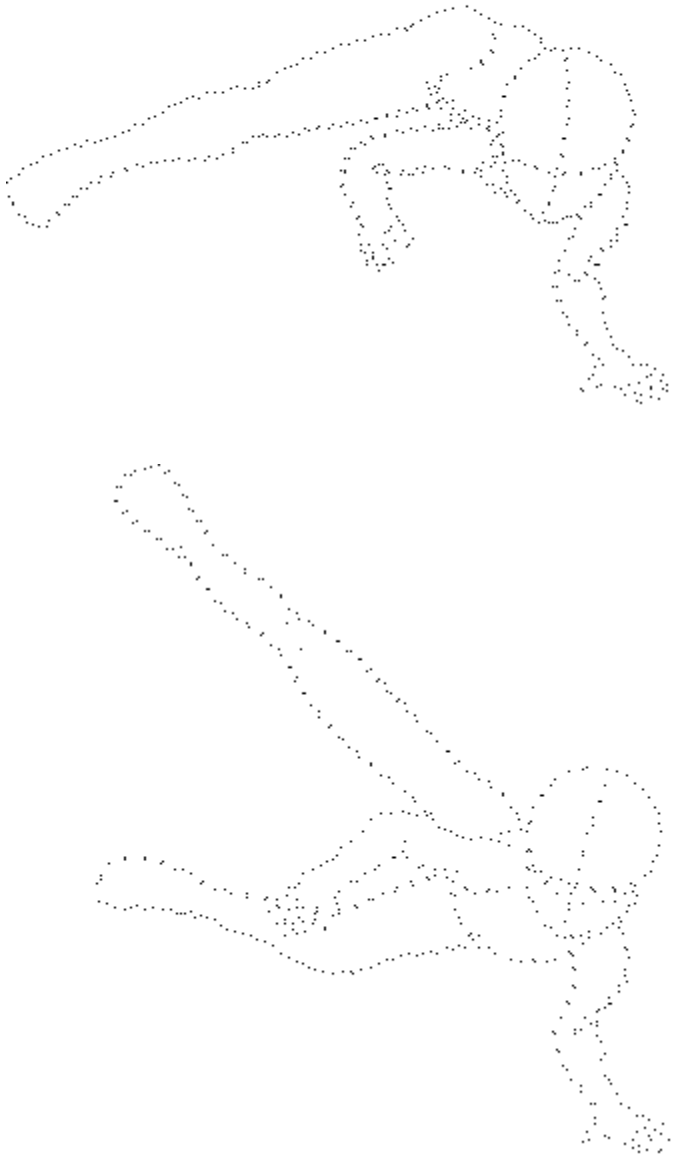


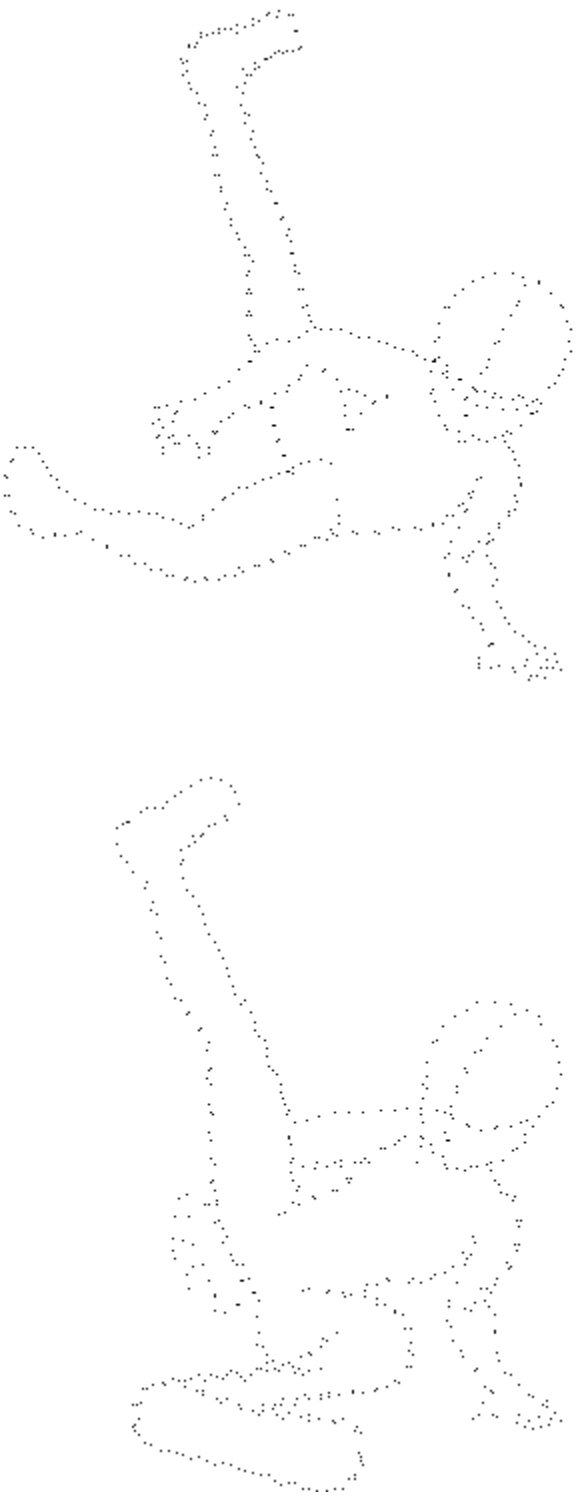


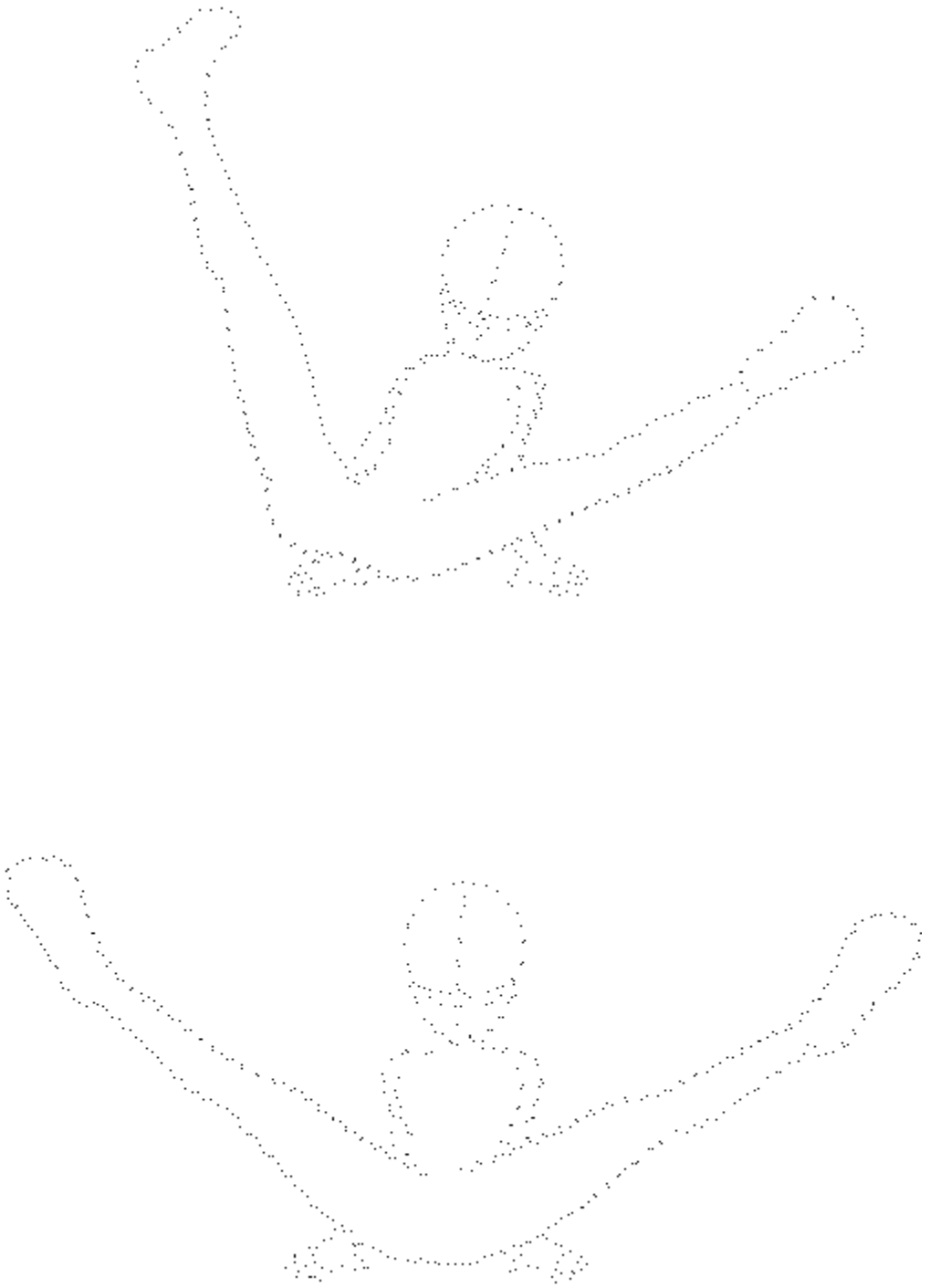


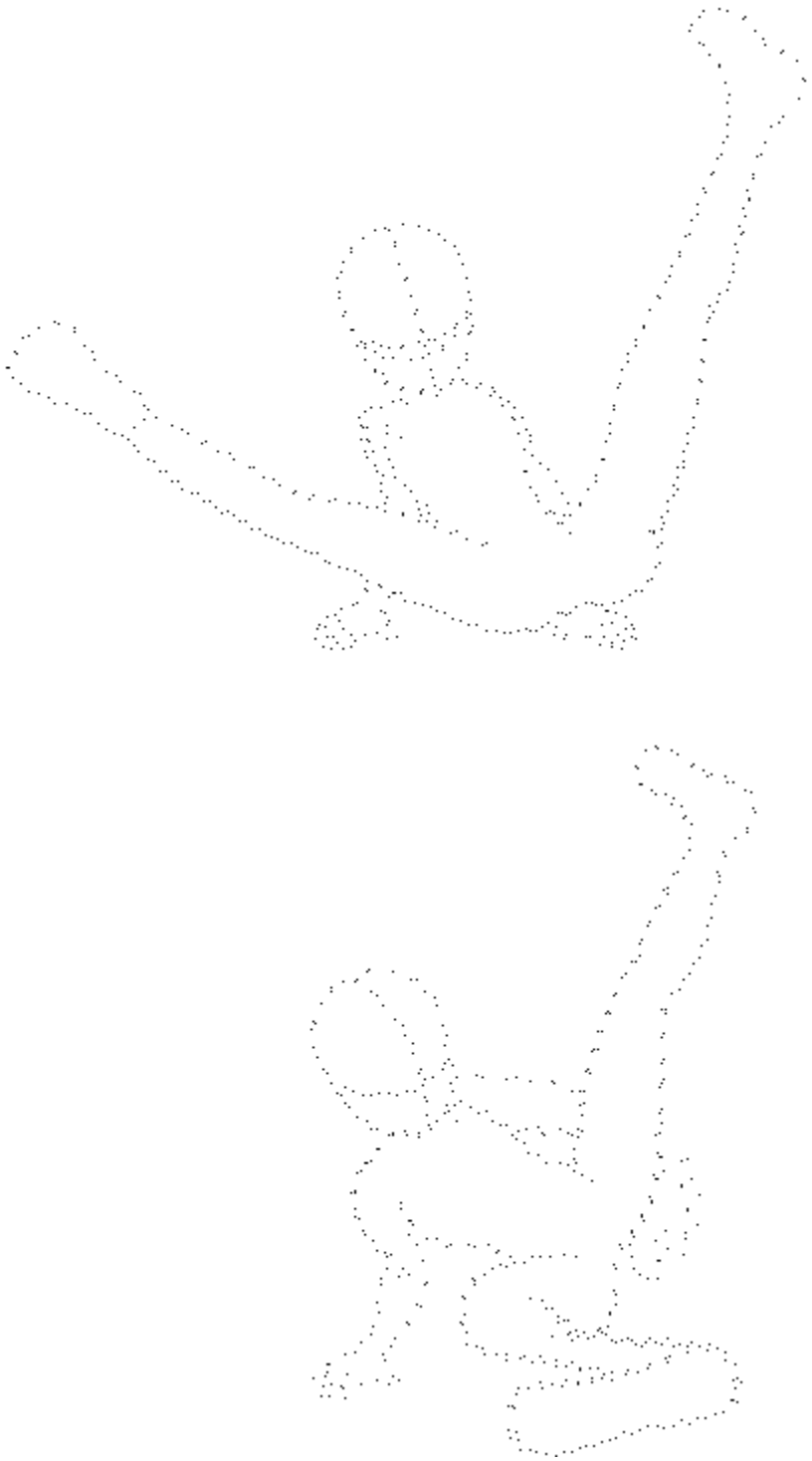


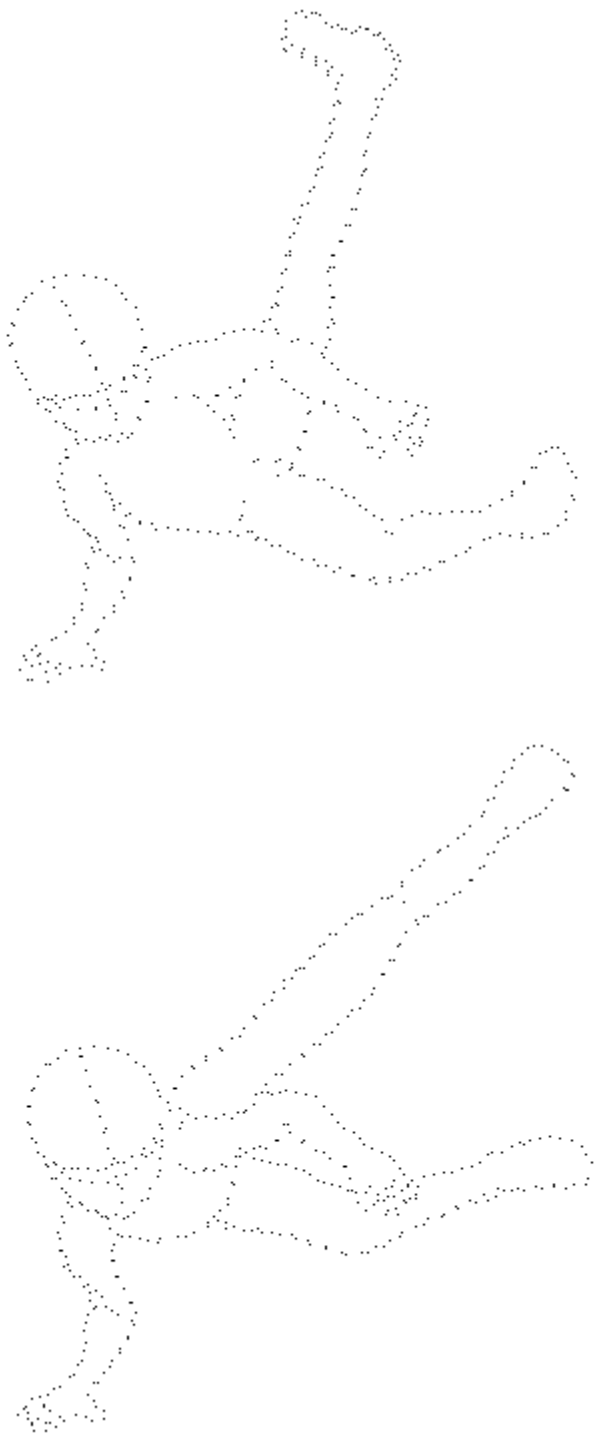


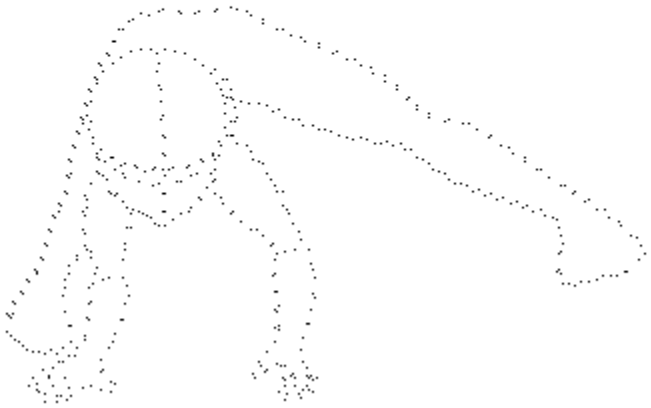












B Code & Derivations

B.1 Derivation

$$a^2 + b^2 - c^2 = 2ab\cos C$$

$$r^2 + r^2 - c^2 = 2 * r * r * \cos\theta$$

$$c^2 = 2r^2(1 - cos\theta)$$

$$c = \sqrt{2r^2(1 - \cos\theta)}$$

$$c = r\sqrt{2(1 - \cos\theta)}$$

$$15s = r\sqrt{2(1 - \cos\theta)} \qquad \text{Plugging r = 200, we get}$$

$$s = \frac{40}{3}\sqrt{2(1 - \cos\theta)}$$

B.2 Ferris Wheel (300 Drones)

```
1  import java.awt.Graphics;
2  import java.awt.geom.AffineTransform;
3  import java.applet.Applet;
4
5  public class FerrisWheel extends Applet
6  {
7          public void paint(Graphics g)
8          {
9                  int centerX = 300;
10                 int centerY = 300;
11                 int droneWidth = 2;
12                 int droneHeight = 1;
13                 int baseDrones = 100;
14                 int perimDrones = 100;
15                 int perimSpacing = 360/perimDrones;
```

```
16                  int radius = 200;
17                  int pause = 100;
18                  int numDrones = 1;
19                  int numSpokes = 10;
20                  int spokeSpacing = 360/numSpokes;
21                  int spokeDrones = 10;
22                  int spokeGap = radius/(spokeDrones+1);
23
24
25
26                  for(int i = 0; i<=0;i++)
27                  {
28
29                  try
30                  {
31                          Thread.sleep(pause);
32                  }catch(InterruptedException ex) {}
33                  g.clearRect(0, 0, 1000, 650);
34
35                  for(int b = 1; b <= (int)baseDrones/2.0;b++)
36                  {
37                  g.fillRect(centerX+b*140/(baseDrones/2),(int)(
                        centerY+b*140/(baseDrones/2)*Math.sqrt(3)),
                        droneWidth, droneHeight);
38                          g.fillRect(centerX-b*140/(baseDrones/2),(
                            int)(centerY+b*140/(baseDrones/2)*Math.
                            sqrt(3)),droneWidth, droneHeight);
39                  }
40
41
```

```
42
43                  for(int a = 0; a <=(360-perimSpacing); a+=
                        perimSpacing) // print outer circle with drones
                         every (perimSpacing) degrees
44                  {
45                          g.fillRect((int)(centerX + radius*Math.cos
                                (Math.toRadians(i+a))), (int)(centerY +
                                 radius*Math.sin(Math.toRadians(i+a))),
                                 droneWidth, droneHeight);
46                          numDrones++;
47                  }
48
49
50                  for(int j = -90;j<=(360-spokeSpacing);j+=
                        spokeSpacing) // print drones in spokes every (
                        spokeSpacing) degrees
51                  {
52                          for(int k = (radius-spokeGap); k>=spokeGap
                                ;k-=spokeGap) // print a layer of
                                drones every () pixels
53                          {
54                                  g.fillRect((int)(centerX + k*Math.
                                        cos(Math.toRadians(i+j))), (int
                                        )(centerY + k*Math.sin(Math.
                                        toRadians(i+j))), droneWidth,
                                        droneHeight);
55                                  numDrones++;
56                          }
57                  }
58
```

```
59                  }
60
61                  System.out.println(numDrones);
62
63          }
64
65  }
```

B.3 Ferris Wheel (500 Drones)

```
1  import java.awt.Graphics;
2  import java.awt.geom.AffineTransform;
3  import java.applet.Applet;
4  public class FerrisWheel extends Applet
5  {
6           public void paint(Graphics g)
7           {
8                   int centerX = 300;
9                   int centerY = 300;
10                  int droneWidth = 2;
11                  int droneHeight = 1;
12                  int baseDrones = 165;
13                  int perimDrones = 165;
14                  int perimSpacing = 360/perimDrones;
15                  int radius = 200;
16                  int pause = 100;
17                  int numDrones = 1;
18                  int numSpokes = 10;
19                  int spokeSpacing = 360/numSpokes;
20                  int spokeDrones = 17;
21                  int spokeGap = radius/(spokeDrones+1);
```

```
22
23
24
25                  for(int i = 0; i<=0;i++)
26                  {
27
28                  try
29                  {
30                          Thread.sleep(pause);
31                  }catch(InterruptedException ex) {}
32                  g.clearRect(0, 0, 1000, 650);
33
34                  for(int b = 1; b <= (int)baseDrones/2.0;b++)
35                  {
36                  g.fillRect(centerX+b*140/(baseDrones/2),(int)(
                        centerY+b*140/(baseDrones/2)*Math.sqrt(3)),
                        droneWidth, droneHeight);
37                          g.fillRect(centerX-b*140/(baseDrones/2),(
                                int)(centerY+b*140/(baseDrones/2)*Math.
                                sqrt(3)),droneWidth, droneHeight);
38                  }
39
40
41
42                  for(int a = 0; a <=(360-perimSpacing); a+=
                        perimSpacing) // print outer circle with drones
                         every (perimSpacing) degrees
43                  {
44                          g.fillRect((int)(centerX + radius*Math.cos
                                (Math.toRadians(i+a))), (int)(centerY +
```

```
                                radius*Math.sin(Math.toRadians(i+a))),
                                droneWidth, droneHeight);
45                          numDrones++;
46                  }
47
48
49                  for(int j = -90;j<=(360-spokeSpacing);j+=
                        spokeSpacing) // print drones in spokes every (
                        spokeSpacing) degrees
50                  {
51                          for(int k = (radius-spokeGap); k>=spokeGap
                                ;k-=spokeGap) // print a layer of
                                drones every () pixels
52                          {
53                                  g.fillRect((int)(centerX + k*Math.
                                        cos(Math.toRadians(i+j))), (int
                                        )(centerY + k*Math.sin(Math.
                                        toRadians(i+j))), droneWidth,
                                        droneHeight);
54                                  numDrones++;
55                          }
56                  }
57
58                  }
59
60                  System.out.println(numDrones);
61
62          }
63
64  }
```

B.4 Heuristic Algorithm

Text of Appendix B is Here

```
#include <vector>
#include <algorithm>
#include <cmath>
#include <limits>
#include <string>
#include <sstream>
#include "EasyBMP.h"

using namespace std;

struct sort_ffunc {
    bool operator()(pair<int, int> p1, pair<int, int> p2) {
        if (p1.first == p2.first) return p1.second < p2.second;
        return p1.first < p2.first;
    }
} sort_func;

vector<pair<int, int> > points;

double dist(pair<int, int> p1, pair<int, int> p2) {
    int x = (p1.first - p2.first);
    int y = (p1.second - p2.second);
    return sqrt(x * x + y * y);
}

//compile: g++ -o program4.exe himcm4.cpp EasyBMP.cpp
int main(int argc, char *argv[]) {
```

```
28      BMP pic;
29      pic.ReadFromFile(argv[1]);
30
31      for (int i = 0; i < pic.TellWidth(); ++i)
32          for (int j = 0; j < pic.TellHeight(); ++j) {
33              if (pic(i, j)->Red != 255 || pic(i, j)->Green != 255
                    || pic(i, j)->Blue != 255) {
34                  points.push_back(make_pair(i, j));
35              }
36          }
37
38      sort(points.begin(), points.end(), sort_func);
39      cout << points.size() << '\n';
40      vector<bool> added(points.size(), false);
41
42      vector<int> order;
43      int cur = 0;
44      while (true) {
45          order.push_back(cur);
46          added[cur] = true;
47          if (order.size() == points.size()) break;
48
49          int best = -1;
50          double best_dist = numeric_limits<double>::infinity();
51          for (int i = 0; i < points.size(); ++i) {
52              if (added[i]) continue;
53              double d = dist(points[cur], points[i]);
54              if (d < best_dist)
55                  best_dist = d, best = i;
56          }
```

```
57
58          cur = best;
59          }
60
61          string num_dro(argv[3]);
62          stringstream num_dros(num_dro);
63          int numdrones = 500;
64          num_dros >> numdrones;
65
66      int skip = points.size() / numdrones;
67      ++skip;
68      if (skip <= 0) skip = 1;
69
70      BMP out;
71      out.SetSize(pic.TellWidth(), pic.TellHeight());
72      out.SetBitDepth(1);
73      int num = 0;
74
75      int rskip = skip;
76
77      int dronesleft = numdrones - 1;
78      for (int i = 0; i < points.size(); i += rskip) {
79          ++num;
80          int x = points[order[i]].first;
81          int y = points[order[i]].second;
82
83          out(x, y)->Red = 0;
84          out(x, y)->Green = 0;
85          out(x, y)->Blue = 0;
86
```

```
87          if (i + dronesleft * skip > points.size())
88              rskip = skip - 1;
89          else rskip = skip;
90
91          --dronesleft;
92      }
93      cout << num << '\n';
94
95      out.WriteToFile(argv[2]);
96
97
98      return 0;
99  }
```

B.5 Recursive Bipartite Mapping Algorithm

```
1  #include <iostream>
2  #include <string.h>
3  #include <vector>
4  #include <algorithm>
5  #include <cmath>
6  #include <cstdio>
7  #include "EasyBMP.h"
8
9  using namespace std;
10
11 #define M 500
12 #define N 500
13
14 bool graph[M][N];
```

```
15 bool seen[N];
16 int matchL[M], matchR[N];
17 int n, m;
18
19 int startsz;
20 int endsz;
21
22
23 bool bpm( int u )
24 {
25     for( int v = 0; v < n; v++ ) if( graph[u][v] )
26     {
27         if( seen[v] ) continue;
28         seen[v] = true;
29
30         if( matchR[v] < 0 || bpm( matchR[v] ) )
31         {
32             matchL[u] = v;
33             matchR[v] = u;
34             return true;
35         }
36     }
37     return false;
38 }
39
40 int num_matching() {
41     // Read input and populate graph[][]
42     // Set m, n
43     m = startsz; n = endsz;
44
```

```
45      memset( matchL, -1, sizeof( matchL ) );
46      memset( matchR, -1, sizeof( matchR ) );
47      int cnt = 0;
48      for( int i = 0; i < m; i++ ) {
49          memset( seen, 0, sizeof( seen ) );
50          if( bpm( i ) ) cnt++;
51      }
52
53      // cnt contains the number of happy pigeons
54      // matchL[i] contains the hole of pigeon i or -1 if pigeon i
            is unhappy
55      // matchR[j] contains the pigeon in hole j or -1 if hole j is
            empty
56
57      // int ans = 0;
58      // for (int i = 0; i < n; ++i)
59
60      cout << cnt << '\n';
61      return cnt;
62  }
63
64  struct Point3d {
65      int x, y, z;
66  };
67
68  Point3d start[500];
69  Point3d eend[500];
70
71  double dist(int a, int b) {
72      double x = start[a].x - eend[b].x;
```

```
73      double y = start[a].y - eend[b].y;
74      double z = start[a].z - eend[b].z;
75
76      return sqrt(x * x + y * y + z * z);
77  }
78
79  int main(int argc, char* argv[])
80  {
81      n = startsz;
82      m = endsz;
83
84      printf("holas amigos\n");
85
86      BMP pic;
87      pic.ReadFromFile(argv[1]);
88      startsz = 0;
89      for (int i = 0; i < pic.TellWidth(); ++i) {
90          for (int j = 0; j < pic.TellHeight(); ++j) {
91              if (pic(i, j)->Red != 255 || pic(i, j)->Green != 255
                    || pic(i, j)->Blue != 255) {
92                  cout << i << ' ' << j << '\n';
93                  start[startsz].x = i;
94                  start[startsz].y = j;
95                  start[startsz++].z = 0;
96              }
97          }
98      }
99
100     cout << "\n\n\n";
101
```

```
102     BMP pic2;
103     pic2.ReadFromFile(argv[2]);
104     endsz = 0;
105     for (int i = 0; i < pic2.TellWidth(); ++i) {
106         for (int j = 0; j < pic2.TellHeight(); ++j) {
107             if (pic2(i, j)->Red != 255 || pic2(i, j)->Green != 255
                    || pic2(i, j)->Blue != 255) {
108                 eend[endsz].x = i;
109                 eend[endsz].y = j;
110                 eend[endsz++].z = 0;
111             }
112         }
113     }
114
115     cout << startsz << ' ' << endsz << '\n';
116
117
118     printf("hello\n");
119
120     vector<double> lst;
121     for (int i = 0; i < startsz; ++i) {
122         for (int j = 0; j < endsz; ++j) {
123             lst.push_back(dist(i, j));
124         }
125     }
126
127     sort(lst.begin(), lst.end());
128
129     int l = 0;
130     int r = lst.size() - 1;
```

```
131
132     while (l < r) {
133         printf("%d %d\n", l, r);
134         int m = (l + r) / 2;
135         double d = lst[m];
136         for (int i = 0; i < startsz; ++i) {
137             for (int j = 0; j < endsz; ++j) {
138                 if (dist(i, j) <= d) graph[i][j] =  1;
139                 else graph[i][j] = 0;
140             }
141         }
142
143         int ans = num_matching();
144         cout << ans << '\n';
145         if (ans == startsz || ans == endsz) {
146             r = m;
147         }
148         else {
149             l = m + 1;
150         }
151
152     }
153
154     int ans = (l + r) / 2;
155     cout << lst[ans] << '\n';
156
157     freopen("500pathstartferris.txt", "w", stdout);
158     double d = lst[ans];
159     for (int i = 0; i < startsz; ++i) {
160         for (int j = 0; j < endsz; ++j) {
```

```
161                 if (dist(i, j) <= d) graph[i][j] =  1;
162                 else graph[i][j] = 0;
163             }
164         }
165
166         num_matching();
167         for (int i = 0; i < startsz; ++i) {
168             if (matchL[i] != -1) {
169                 int a = (start[i].x + eend[matchL[i]].x) / 2;
170                 int b = (start[i].y + eend[matchL[i]].y) / 2;
171                 printf("%d %d\n", a, b);
172             }
173         }
174
175
176
177     // for (auto i : lst) cout << i << ' ';
178
179         return 0;
180 }
```

C Raw Data

Start point to end point

C.1 Ground to Ferris Wheel

152 753 → 200 56	202 753 → 53 287	252 753 → 287 446
154 753 → 188 59	204 753 → 56 299	254 753 → 299 443
156 753 → 176 64	206 753 → 59 311	256 753 → 311 440
158 753 → 164 69	208 753 → 64 323	258 753 → 323 435
160 753 → 153 74	210 753 → 69 335	260 753 → 335 430
162 753 → 142 81	212 753 → 74 346	262 753 → 346 425
164 753 → 132 88	214 753 → 81 357	264 753 → 357 418
166 753 → 122 95	216 753 → 88 367	266 753 → 367 411
168 753 → 113 104	218 753 → 95 377	268 753 → 377 404
170 753 → 104 113	220 753 → 104 386	270 753 → 386 395
172 753 → 95 122	222 753 → 113 395	272 753 → 395 386
174 753 → 88 132	224 753 → 122 404	274 753 → 404 377
176 753 → 212 53	226 753 → 132 411	276 753 → 411 367
178 753 → 81 142	228 753 → 142 418	278 753 → 418 357
180 753 → 74 153	230 753 → 153 425	280 753 → 425 346
182 753 → 69 164	232 753 → 164 430	282 753 → 430 335
184 753 → 64 176	234 753 → 176 435	284 753 → 435 323
186 753 → 59 188	236 753 → 188 440	286 753 → 440 311
188 753 → 56 200	238 753 → 200 443	288 753 → 443 299
190 753 → 53 212	240 753 → 212 446	290 753 → 446 287
192 753 → 51 224	242 753 → 224 448	292 753 → 448 275
194 753 → 50 237	244 753 → 237 449	294 753 → 449 262
196 753 → 50 250	246 753 → 250 450	296 753 → 450 250
198 753 → 50 262	248 753 → 262 449	298 753 → 449 237
200 753 → 51 275	250 753 → 275 448	300 753 → 448 224

302 753 → 446 212
304 753 → 443 200
306 753 → 440 188
308 753 → 435 176
310 753 → 430 164
312 753 → 425 153
314 753 → 418 142
316 753 → 411 132
318 753 → 404 122
320 753 → 395 113
322 753 → 386 104
324 753 → 287 53
326 753 → 377 95
328 753 → 367 88
330 753 → 357 81
332 753 → 346 74
334 753 → 335 69
336 753 → 323 64
338 753 → 311 59
340 753 → 299 56
342 753 → 250 230
344 753 → 238 233
346 753 → 230 243
348 753 → 230 256
350 753 → 238 266
152 752 → 250 270
154 752 → 261 266
156 752 → 269 256
158 752 → 269 243
160 752 → 261 233
162 752 → 250 212
164 752 → 227 219
166 752 → 213 238
168 752 → 213 261
170 752 → 227 280
172 752 → 250 288
174 752 → 272 280
176 752 → 286 261
178 752 → 286 238
180 752 → 272 219
182 752 → 250 194
184 752 → 217 204
186 752 → 196 232
188 752 → 196 267
190 752 → 217 295
192 752 → 250 306
194 752 → 282 295
196 752 → 303 267
198 752 → 303 232
200 752 → 282 204
202 752 → 250 176
204 752 → 206 190
206 752 → 179 227
208 752 → 179 272
210 752 → 206 309
212 752 → 250 324
214 752 → 293 309
216 752 → 320 272
218 752 → 320 227
220 752 → 293 190
222 752 → 250 158
224 752 → 224 51
226 752 → 195 175
228 752 → 162 221
230 752 → 162 278
232 752 → 195 324
234 752 → 250 342
236 752 → 304 324
238 752 → 337 278
240 752 → 337 221
242 752 → 304 175
244 752 → 250 140
246 752 → 185 161
248 752 → 145 216
250 752 → 145 283
252 752 → 185 338
254 752 → 250 360
256 752 → 314 338
258 752 → 354 283
260 752 → 354 216
262 752 → 314 161
264 752 → 250 122
266 752 → 174 146
268 752 → 128 210
270 752 → 128 289
272 752 → 174 353
274 752 → 275 51
276 752 → 250 378
278 752 → 325 353
280 752 → 371 289

282 752 → 371 210
284 752 → 325 146
286 752 → 250 104
288 752 → 164 131
290 752 → 111 204
292 752 → 111 295
294 752 → 164 368
296 752 → 250 396
298 752 → 335 368
300 752 → 388 295
302 752 → 388 204
304 752 → 335 131
306 752 → 250 86
308 752 → 153 117
310 752 → 94 199
312 752 → 94 300
314 752 → 153 382
316 752 → 250 414
318 752 → 346 382
320 752 → 405 300
322 752 → 405 199
324 752 → 346 117
326 752 → 250 68
328 752 → 143 102
330 752 → 76 193
332 752 → 76 306
334 752 → 143 397
336 752 → 250 432
338 752 → 356 397
340 752 → 423 306
342 752 → 423 193
344 752 → 356 102
346 752 → 110 492
348 752 → 390 492
350 752 → 113 487
152 751 → 387 487
154 751 → 116 482
156 751 → 384 482
158 751 → 119 476
160 751 → 381 476
162 751 → 122 471
164 751 → 378 471
166 751 → 124 468
168 751 → 376 468
170 751 → 127 463
172 751 → 373 463
174 751 → 130 457
176 751 → 370 457
178 751 → 133 452
180 751 → 367 452
182 751 → 136 447
184 751 → 364 447
186 751 → 138 443
188 751 → 362 443
190 751 → 141 438
192 751 → 359 438
194 751 → 144 433
196 751 → 356 433
198 751 → 147 428
200 751 → 353 428
202 751 → 150 423
204 751 → 350 423
206 751 → 152 419
208 751 → 348 419
210 751 → 155 414
212 751 → 345 414
214 751 → 158 409
216 751 → 342 409
218 751 → 161 404
220 751 → 339 404
222 751 → 164 398
224 751 → 336 398
226 751 → 166 395
228 751 → 334 395
230 751 → 169 390
232 751 → 331 390
234 751 → 172 385
236 751 → 237 50
238 751 → 328 385
240 751 → 175 379
242 751 → 325 379
244 751 → 178 374
246 751 → 322 374
248 751 → 180 371
250 751 → 250 50
252 751 → 320 371
254 751 → 183 366
256 751 → 317 366
258 751 → 186 360
260 751 → 314 360

262 751 → 262 50
264 751 → 189 355
266 751 → 311 355
268 751 → 192 350
270 751 → 308 350
272 751 → 194 346
274 751 → 306 346
276 751 → 197 341
278 751 → 303 341
280 751 → 200 336
282 751 → 300 336
284 751 → 203 331
286 751 → 297 331
288 751 → 206 326
290 751 → 294 326
292 751 → 208 322
294 751 → 292 322
296 751 → 211 317
298 751 → 289 317
300 751 → 214 312
302 751 → 286 312
304 751 → 217 307
306 751 → 283 307
308 751 → 220 301
310 751 → 280 301
312 751 → 222 298
314 751 → 278 298
316 751 → 225 293
318 751 → 275 293
320 751 → 228 288
322 751 → 272 288
324 751 → 231 282
326 751 → 269 282
328 751 → 234 277
330 751 → 266 277
332 751 → 236 274
334 751 → 264 274
336 751 → 239 269
338 751 → 261 269
340 751 → 242 263
342 751 → 258 263
344 751 → 245 258
346 751 → 255 258
348 751 → 248 253
350 751 → 252 253

C.2 Ferris Wheel to Dragon

212 0 → 217 124
225 1 → 316 0
237 3 → 326 90
249 6 → 277 78
261 9 → 357 45
273 14 → 264 53
285 19 → 266 29
296 24 → 339 73
307 31 → 276 36
317 38 → 379 10
327 45 → 284 6
336 54 → 294 45
345 63 → 258 27
354 72 → 342 3
361 82 → 283 89
368 92 → 310 102
375 103 → 304 3
380 114 → 248 36
385 126 → 281 88
390 138 → 249 160
393 150 → 272 68
396 162 → 324 61
398 174 → 352 4
399 187 → 365 6
400 200 → 389 13
399 212 → 403 21
398 225 → 396 18
396 237 → 410 23
393 249 → 416 30
390 261 → 382 35
385 273 → 353 47
380 285 → 343 64
375 296 → 342 72
368 307 → 344 84
361 317 → 312 102
354 327 → 290 108

345 336 → 296 125
336 345 → 302 121
327 354 → 301 132
317 361 → 300 139
307 368 → 299 144
296 375 → 349 217
285 380 → 340 222
273 385 → 317 243
261 390 → 348 210
249 393 → 348 205
237 396 → 342 217
225 398 → 340 228
212 399 → 338 232
200 400 → 286 246
187 399 → 300 243
174 398 → 328 235
162 396 → 328 242
150 393 → 322 247
138 390 → 312 252
126 385 → 307 247
114 380 → 297 244
103 375 → 294 257
92 368 → 291 257
82 361 → 276 254
72 354 → 270 248
63 345 → 268 254
54 336 → 265 252
45 327 → 251 236
38 317 → 251 245
31 307 → 250 243

24 296 → 245 249
19 285 → 243 263
14 273 → 241 267
9 261 → 235 267
6 249 → 232 253
3 237 → 230 253
1 225 → 219 254
0 212 → 209 184
0 200 → 225 229
0 187 → 30 49
1 174 → 216 207
3 162 → 225 115
6 150 → 226 95
9 138 → 230 98
14 126 → 236 76
19 114 → 239 56
24 103 → 237 76
31 92 → 249 29
38 82 → 255 36
45 72 → 265 12
54 63 → 273 8
63 54 → 288 41
72 45 → 295 3
82 38 → 306 50
92 31 → 247 8
103 24 → 329 0
114 19 → 266 30
126 14 → 267 55
138 9 → 31 72
150 6 → 190 180

162 3 → 253 189
174 1 → 258 203
187 0 → 81 32
200 0 → 310 101
306 52 → 276 139
373 143 → 328 65
373 256 → 405 31
306 347 → 301 119
200 382 → 283 241
93 347 → 278 237
26 256 → 248 242
26 143 → 252 158
93 52 → 183 149
200 18 → 248 182
296 67 → 245 13
355 149 → 312 54
355 250 → 373 38
296 332 → 288 107
200 364 → 271 227
103 332 → 274 235
44 250 → 254 200
44 149 → 242 56
103 67 → 218 113
200 36 → 229 94
285 81 → 257 16
338 154 → 346 53
338 245 → 265 249
285 318 → 321 94
200 346 → 288 137
114 318 → 268 223

61 245 → 249 192
61 154 → 235 197
114 81 → 222 107
200 54 → 239 265
275 96 → 69 25
321 160 → 254 18
321 239 → 361 41
275 303 → 333 85
200 328 → 295 126
124 303 → 264 221
78 239 → 115 39
78 160 → 244 21
124 96 → 230 89
200 72 → 38 31
264 111 → 243 55
304 166 → 244 201
304 233 → 262 213
264 288 → 341 79
200 310 → 279 138
135 288 → 260 145
95 233 → 44 25
95 166 → 217 189
135 111 → 186 191
200 90 → 215 126
254 125 → 215 141
287 171 → 242 49
287 228 → 245 36
254 274 → 263 245
200 292 → 264 145
145 274 → 258 238

112 228 → 52 86
112 171 → 61 64
145 125 → 211 132
200 108 → 194 198
243 140 → 63 11
270 177 → 223 240
270 222 → 237 70
243 259 → 255 196
200 274 → 272 71
156 259 → 218 134
129 222 → 45 84
129 177 → 188 172
156 140 → 79 50
200 126 → 25 79
232 154 → 59 91
253 182 → 197 196
253 217 → 219 220
232 245 → 224 123
200 256 → 234 77
167 245 → 195 142
146 217 → 132 38
146 182 → 177 108
167 154 → 44 76
200 144 → 182 150
222 169 → 165 169
236 188 → 197 143
236 211 → 212 148
222 230 → 99 43
200 238 → 107 189
177 230 → 30 64

163 211 → 168 90
163 188 → 57 15
177 169 → 180 194
200 162 → 86 102
211 183 → 133 65
219 193 → 167 151
219 206 → 46 87
211 216 → 122 85
200 220 → 124 38
188 216 → 194 196
180 206 → 104 178
180 193 → 72 83
188 183 → 30 83
200 180 → 83 50
202 203 → 101 38
198 203 → 62 82
205 208 → 106 110
195 208 → 107 39
208 213 → 63 61
192 213 → 93 104
211 219 → 147 77
189 219 → 167 146
214 224 → 201 177
186 224 → 111 164
216 227 → 113 191
184 227 → 35 86
219 232 → 87 82
181 232 → 69 96
222 238 → 98 83
178 238 → 85 35

225 243 → 153 148
175 243 → 119 175
228 248 → 132 132
172 248 → 124 123
230 251 → 123 121
170 251 → 124 48
233 257 → 129 57
167 257 → 108 42
236 262 → 130 85
164 262 → 120 162
239 267 → 140 71
161 267 → 49 74
242 272 → 131 180
158 272 → 113 114
244 276 → 142 133
156 276 → 180 191
247 281 → 152 168
153 281 → 155 81
250 286 → 174 95
150 286 → 139 149
253 291 → 167 92
147 291 → 145 88
256 296 → 136 130
144 296 → 79 98
258 300 → 176 94
142 300 → 117 118
261 305 → 178 170
139 305 → 163 87
264 310 → 179 111
136 310 → 127 191
267 316 → 110 169
133 316 → 98 109
270 321 → 174 190
130 321 → 127 129
272 324 → 110 164
128 324 → 119 176
275 329 → 191 189
125 329 → 130 152
278 335 → 184 127
122 335 → 100 174
281 340 → 186 154
119 340 → 140 150
284 345 → 207 149
116 345 → 124 156
286 348 → 121 197
114 348 → 137 140
289 354 → 204 157
111 354 → 150 143
292 359 → 165 175
108 359 → 141 173
295 364 → 176 185
105 364 → 142 176
298 369 → 199 182
102 369 → 153 150
300 373 → 218 232
100 373 → 161 173
303 378 → 211 202
97 378 → 125 178
306 383 → 199 188
94 383 → 131 182
309 388 → 243 180
91 388 → 127 178
312 393 → 222 195
88 393 → 172 199
314 397 → 214 197
86 397 → 100 180
317 402 → 205 205
83 402 → 181 203
320 407 → 205 213
80 407 → 100 193
323 413 → 242 226
77 413 → 176 209
326 418 → 211 223
74 418 → 117 199
328 421 → 238 254
72 421 → 224 259
331 426 → 228 238
69 426 → 229 264
334 432 → 231 249
66 432 → 104 210
337 437 → 216 246
63 437 → 107 213
340 442 → 217 260
60 442 → 60 442

C.3 Dragon to Dancer

25 79 → 96 203
30 49 → 165 144
30 64 → 179 135
30 83 → 115 180
31 72 → 75 219
35 86 → 57 243
38 31 → 124 173
44 25 → 159 146
44 76 → 83 235
45 84 → 199 126
46 87 → 199 156
49 74 → 89 208
52 86 → 83 249
57 15 → 169 140
59 91 → 201 163
61 64 → 95 203
62 82 → 84 246
63 11 → 172 140
63 61 → 91 204
69 25 → 200 124
69 96 → 55 247
72 83 → 196 164
79 50 → 132 197
79 98 → 225 176
81 32 → 119 180
83 50 → 99 196
85 35 → 131 168
86 102 → 244 157
87 82 → 236 152
93 104 → 228 200
98 83 → 228 182
98 109 → 228 200
99 43 → 120 205
100 174 → 265 200
100 180 → 259 173
100 193 → 268 206
101 38 → 110 186
104 178 → 259 163
104 210 → 256 204
106 110 → 265 163
107 39 → 209 157
107 189 → 264 248
107 213 → 251 295
108 42 → 234 152
110 164 → 246 212
110 169 → 267 222
111 164 → 264 234
113 114 → 262 193
113 191 → 256 281
115 39 → 226 165
117 118 → 261 187
117 199 → 224 157
119 175 → 265 254
119 176 → 255 269
120 162 → 242 217
121 197 → 266 267
122 85 → 270 166
123 121 → 280 172
124 38 → 249 150
124 48 → 253 155
124 123 → 269 207
124 156 → 249 229
125 178 → 251 208
127 129 → 267 221
127 178 → 238 216
127 191 → 267 275
129 57 → 93 221
130 85 → 70 224
130 152 → 227 214
131 180 → 201 256
131 182 → 253 269
132 38 → 226 162
132 132 → 232 221
133 65 → 227 175
136 130 → 249 243
137 140 → 250 255
139 149 → 243 219
140 71 → 83 212
140 150 → 264 262
141 173 → 258 282
142 133 → 249 256
142 176 → 260 292
145 88 → 62 235
147 77 → 297 151

150 143 → 228 214
152 168 → 275 283
153 148 → 226 180
153 150 → 226 204
155 81 → 305 158
161 173 → 282 290
163 87 → 257 199
165 169 → 206 148
165 175 → 286 291
167 92 → 307 186
167 146 → 252 290
167 151 → 250 239
168 90 → 302 185
172 199 → 284 297
174 95 → 311 190
174 190 → 285 286
176 94 → 265 237
176 185 → 272 294
176 209 → 284 295
177 108 → 318 193
178 170 → 268 295
179 111 → 315 193
180 191 → 209 215
180 194 → 277 297
181 203 → 285 299
182 150 → 276 290
183 149 → 225 221
184 127 → 333 206
186 154 → 212 214
186 191 → 81 216
188 172 → 218 152
190 180 → 212 214
191 189 → 201 290
194 196 → 206 222
194 198 → 273 299
195 142 → 198 269
197 143 → 196 173
197 196 → 68 226
199 182 → 362 220
199 188 → 171 297
201 177 → 195 285
204 157 → 70 256
205 205 → 66 256
205 213 → 107 188
207 149 → 217 221
209 184 → 370 222
211 132 → 203 236
211 202 → 56 244
211 223 → 111 211
212 148 → 198 199
214 197 → 132 199
215 126 → 273 283
215 141 → 87 227
216 207 → 382 235
216 246 → 60 255
217 124 → 204 242
217 189 → 165 290
217 260 → 366 219
218 113 → 352 215
218 134 → 140 162
218 232 → 99 220
219 220 → 75 256
219 254 → 388 256
222 107 → 202 258
222 195 → 378 225
223 240 → 186 269
224 123 → 194 177
224 259 → 198 273
225 115 → 203 207
225 229 → 150 152
226 95 → 348 211
228 238 → 177 282
229 94 → 344 211
229 264 → 138 194
230 89 → 360 197
230 98 → 227 197
230 253 → 83 256
231 249 → 398 260
232 253 → 193 280
234 77 → 224 217
235 197 → 103 195
235 267 → 403 260
236 76 → 226 212
237 70 → 328 203
237 76 → 339 208
238 254 → 96 219
239 56 → 248 224
239 265 → 141 159
241 267 → 84 231
242 49 → 342 184

242 56 → 323 200
242 226 → 185 206
243 55 → 234 222
243 180 → 104 217
243 263 → 80 257
244 21 → 297 181
244 201 → 193 193
245 13 → 314 165
245 36 → 330 180
245 249 → 85 242
247 8 → 179 134
248 36 → 334 180
248 182 → 199 294
248 242 → 124 202
249 29 → 326 175
249 160 → 194 187
249 192 → 136 193
250 243 → 146 186
251 236 → 128 201
251 245 → 157 149
252 158 → 176 290
253 189 → 411 241
254 18 → 293 180
254 200 → 160 180
255 36 → 259 173
255 196 → 108 214
257 16 → 320 169
258 27 → 322 173
258 203 → 116 210
258 238 → 187 245
260 145 → 204 225
262 213 → 143 188
263 245 → 132 166
264 53 → 353 189
264 145 → 170 283
264 221 → 154 181
265 12 → 289 176
265 249 → 183 169
265 252 → 188 255
266 29 → 284 175
266 30 → 265 197
267 55 → 226 189
268 223 → 173 287
268 254 → 165 179
270 248 → 149 155
271 227 → 179 171
272 68 → 369 204
272 71 → 358 215
273 8 → 276 168
274 235 → 186 272
276 36 → 346 184
276 139 → 393 260
276 254 → 183 210
277 78 → 378 211
278 237 → 169 176
279 138 → 151 185
281 88 → 387 217
283 89 → 381 226
283 241 → 180 278
284 6 → 256 160
286 246 → 159 179
288 41 → 354 189
288 107 → 174 173
288 137 → 185 221
290 108 → 191 165
291 257 → 185 293
294 45 → 361 197
294 257 → 178 298
295 3 → 254 160
295 126 → 187 166
296 125 → 414 242
297 244 → 408 258
299 144 → 185 210
300 139 → 186 199
300 243 → 174 291
301 119 → 186 228
301 132 → 417 249
302 121 → 188 128
304 3 → 253 164
306 50 → 369 203
307 247 → 188 130
310 101 → 203 208
310 102 → 386 249
312 54 → 377 208
312 102 → 198 166
312 252 → 187 231
316 0 → 214 125
317 243 → 168 293
321 94 → 197 174
322 247 → 176 294

324 61 → 389 216
326 90 → 385 247
328 65 → 374 224
328 235 → 188 237
328 242 → 188 258
329 0 → 267 133
333 85 → 409 235
338 232 → 187 253
339 73 → 404 228
340 222 → 416 251
340 228 → 412 256
341 79 → 404 232
342 3 → 257 127
342 72 → 397 223
342 217 → 193 290
343 64 → 395 221
344 84 → 385 240
346 53 → 382 211
348 205 → 189 195
348 210 → 189 197
349 217 → 193 190
352 4 → 234 122
353 47 → 225 153
357 45 → 216 124
361 41 → 225 125
365 6 → 246 123
373 38 → 230 123
379 10 → 255 124
382 35 → 244 122
389 13 → 277 138
396 18 → 287 145
403 21 → 289 145
405 31 → 273 135
410 23 → 311 160
416 30 → 300 152

C.4 Dancer to Ground

55 247 → 348 751
56 244 → 346 751
57 243 → 344 751
60 255 → 342 751
62 235 → 340 751
66 256 → 338 751
68 226 → 336 751
70 224 → 334 751
70 256 → 332 751
75 219 → 330 751
75 256 → 328 751
80 257 → 326 751
81 216 → 154 751
83 212 → 324 751
83 235 → 256 751
83 249 → 216 751
83 256 → 322 751
84 231 → 214 751
84 246 → 228 752
85 242 → 210 752
87 227 → 320 751
89 208 → 336 752
91 204 → 318 751
93 221 → 252 751
95 203 → 204 751
96 203 → 316 751
96 219 → 312 751
99 196 → 232 751
99 220 → 310 751
103 195 → 198 751
104 217 → 308 751
107 188 → 262 751
108 214 → 258 751
110 186 → 306 751
111 211 → 296 751
115 180 → 294 751
116 210 → 292 751
119 180 → 290 751
120 205 → 254 751
124 173 → 284 751
124 202 → 282 751
128 201 → 242 751
131 168 → 312 752
132 166 → 230 751
132 197 → 240 751

132 199 → 224 751
136 193 → 236 751
138 194 → 276 751
140 162 → 210 751
141 159 → 228 751
143 188 → 270 751
146 186 → 246 751
149 155 → 184 752
150 152 → 220 751
151 185 → 238 751
154 181 → 156 751
157 149 → 248 751
159 179 → 190 751
159 146 → 302 751
160 180 → 226 751
165 144 → 298 751
165 179 → 208 751
165 290 → 222 751
168 293 → 218 751
169 140 → 314 751
169 176 → 300 752
170 283 → 212 751
171 297 → 192 751
172 140 → 278 751
173 287 → 290 752
174 173 → 206 751
174 291 → 202 751
176 290 → 306 752
176 294 → 200 751
177 282 → 196 751
178 298 → 194 751
179 134 → 300 751
179 135 → 260 751
179 171 → 188 751
180 278 → 186 751
183 169 → 184 751
183 210 → 182 751
185 206 → 180 751
185 210 → 178 751
185 221 → 176 751
185 293 → 174 751
186 199 → 172 751
186 228 → 170 751
186 269 → 168 751
186 272 → 166 751
187 166 → 164 751
187 231 → 162 751
187 245 → 160 751
187 253 → 158 751
188 128 → 272 751
188 130 → 288 751
188 237 → 152 751
188 255 → 350 752
188 258 → 348 752
189 195 → 346 752
189 197 → 344 752
191 165 → 342 752
193 190 → 340 752
193 193 → 272 752
193 290 → 338 752
193 280 → 334 752
194 177 → 332 752
194 187 → 330 752
195 285 → 328 752
196 164 → 326 752
196 173 → 324 752
197 174 → 322 752
198 166 → 320 752
198 199 → 318 752
198 269 → 316 752
198 273 → 314 752
199 126 → 268 751
199 156 → 310 752
199 294 → 308 752
200 124 → 250 751
201 163 → 274 752
201 256 → 304 752
201 290 → 302 752
202 258 → 298 752
203 207 → 296 752
203 208 → 294 752
203 236 → 262 752
204 225 → 292 752
204 242 → 288 752
206 148 → 286 752
206 222 → 284 752
209 157 → 212 752
209 215 → 282 752
212 214 → 278 752
212 214 → 276 752

214 125 → 274 751
216 124 → 266 751
217 221 → 270 752
218 152 → 268 752
224 157 → 266 752
224 217 → 264 752
225 125 → 286 751
225 153 → 260 752
225 176 → 258 752
225 221 → 256 752
226 162 → 254 752
226 165 → 252 752
226 180 → 250 752
226 189 → 248 752
226 204 → 246 752
226 212 → 244 752
227 175 → 242 752
227 197 → 240 752
227 214 → 238 752
228 182 → 236 752
228 200 → 234 752
228 214 → 232 752
228 200 → 230 752
230 123 → 264 751
232 221 → 226 752
234 122 → 234 751
234 152 → 224 752
234 222 → 222 752
236 152 → 220 752
238 216 → 218 752
242 217 → 216 752
243 219 → 168 752
244 122 → 244 751
244 157 → 214 752
246 123 → 280 751
246 212 → 208 752
248 224 → 206 752
249 150 → 204 752
249 229 → 202 752
249 243 → 200 752
249 256 → 198 752
250 239 → 196 752
250 255 → 194 752
251 208 → 192 752
251 295 → 190 752
252 290 → 188 752
253 155 → 178 752
253 164 → 186 752
253 269 → 182 752
254 160 → 180 752
255 124 → 304 751
255 269 → 176 752
256 160 → 174 752
256 204 → 172 752
256 281 → 170 752
257 127 → 280 752
257 199 → 166 752
258 282 → 164 752
259 163 → 162 752
259 173 → 160 752
259 173 → 158 752
260 292 → 156 752
261 187 → 154 752
262 193 → 152 752
264 234 → 350 753
264 248 → 348 753
264 262 → 346 753
265 163 → 332 753
265 197 → 344 753
265 200 → 340 753
265 237 → 338 753
265 254 → 336 753
266 267 → 334 753
267 133 → 342 753
267 221 → 330 753
267 222 → 328 753
267 275 → 326 753
268 206 → 324 753
268 295 → 322 753
269 207 → 314 753
270 166 → 320 753
272 294 → 316 753
273 135 → 318 753
273 283 → 312 753
273 299 → 310 753
275 283 → 308 753
276 168 → 306 753
276 290 → 304 753
277 138 → 302 753
277 297 → 300 753

280 172 → 298 753
282 290 → 296 753
284 175 → 294 753
284 295 → 292 753
284 297 → 290 753
285 286 → 288 753
285 299 → 286 753
286 291 → 284 753
287 145 → 282 753
289 145 → 280 753
289 176 → 278 753
293 180 → 276 753
297 151 → 274 753
297 181 → 272 753
300 152 → 270 753
302 185 → 268 753
305 158 → 266 753
307 186 → 264 753
311 160 → 262 753
311 190 → 260 753
314 165 → 258 753
315 193 → 256 753
318 193 → 254 753
320 169 → 252 753
322 173 → 250 753
323 200 → 248 753
326 175 → 246 753
328 203 → 244 753
330 180 → 242 753
333 206 → 240 753
334 180 → 238 753
339 208 → 236 753
342 184 → 234 753
344 211 → 232 753
346 184 → 230 753
348 211 → 228 753
352 215 → 226 753
353 189 → 224 753
354 189 → 222 753
358 215 → 220 753
360 197 → 218 753
361 197 → 216 753
362 220 → 214 753
366 219 → 212 753
369 203 → 210 753
369 204 → 208 753
370 222 → 206 753
374 224 → 204 753
377 208 → 202 753
378 211 → 200 753
378 225 → 198 753
381 226 → 196 753
382 211 → 194 753
382 235 → 192 753
385 240 → 190 753
385 247 → 188 753
386 249 → 186 753
387 217 → 184 753
388 256 → 182 753
389 216 → 180 753
393 260 → 178 753
395 221 → 176 753
397 223 → 174 753
398 260 → 172 753
403 260 → 170 753
404 228 → 168 753
404 232 → 166 753
408 258 → 164 753
409 235 → 162 753
411 241 → 160 753
412 256 → 158 753
414 242 → 156 753
416 251 → 154 753
417 249 → 152 753

C.5 Dragon to Dragon

Frame 0 to Frame 1	86 102 → 56 91	121 197 → 118 177
25 79 → 73 95	87 82 → 131 112	122 85 → 136 140
30 49 → 70 81	93 104 → 115 128	123 121 → 112 121
30 64 → 73 104	98 83 → 130 134	124 38 → 105 95
30 83 → 64 95	98 109 → 58 97	124 48 → 124 108
31 72 → 69 98	99 43 → 103 100	124 123 → 106 164
35 86 → 44 87	100 174 → 111 171	124 156 → 92 110
38 31 → 40 70	100 180 → 101 210	125 178 → 185 172
44 25 → 75 75	100 193 → 122 159	127 129 → 148 146
44 76 → 58 92	101 38 → 88 97	127 178 → 97 207
45 84 → 85 107	104 178 → 100 183	127 191 → 183 186
46 87 → 94 116	104 210 → 151 173	129 57 → 136 117
49 74 → 52 59	106 110 → 154 146	130 85 → 84 97
52 86 → 72 105	107 39 → 67 80	130 152 → 99 177
57 15 → 31 49	107 189 → 142 148	131 180 → 118 164
59 91 → 104 119	107 213 → 128 183	131 182 → 115 202
61 64 → 43 57	108 42 → 102 101	132 38 → 99 89
62 82 → 39 66	110 164 → 106 191	132 132 → 116 179
63 11 → 69 69	110 169 → 107 120	133 65 → 142 123
63 61 → 79 107	111 164 → 129 188	136 130 → 101 120
69 25 → 84 80	113 114 → 164 143	137 140 → 101 186
69 96 → 127 112	113 191 → 108 189	139 149 → 120 130
72 83 → 121 108	115 39 → 60 64	140 71 → 149 129
79 50 → 43 90	117 118 → 147 168	140 150 → 107 177
79 98 → 86 113	117 199 → 100 179	141 173 → 190 177
81 32 → 79 79	119 175 → 109 160	142 133 → 116 126
83 50 → 35 56	119 176 → 135 149	142 176 → 136 182
85 35 → 90 85	120 162 → 125 130	145 88 → 165 145

147 77 → 116 107
150 143 → 113 169
152 168 → 108 208
153 148 → 125 175
153 150 → 123 196
155 81 → 161 136
161 173 → 122 156
163 87 → 177 141
165 169 → 127 188
165 175 → 113 196
167 92 → 174 148
167 146 → 133 176
167 151 → 200 185
168 90 → 111 96
172 199 → 168 167
174 95 → 115 102
174 190 → 142 171
176 94 → 118 105
176 185 → 180 198
176 209 → 232 196
177 108 → 129 136
178 170 → 125 166
179 111 → 147 142
180 191 → 216 198
180 194 → 205 212
181 203 → 234 175
182 150 → 139 147
183 149 → 207 198
184 127 → 156 147
186 154 → 174 201
186 191 → 238 174
188 172 → 145 142
190 180 → 208 182
191 189 → 198 195
194 196 → 200 195
194 198 → 160 173
195 142 → 135 137
197 143 → 176 173
197 196 → 193 191
199 182 → 142 178
199 188 → 171 143
201 177 → 187 148
204 157 → 170 172
205 205 → 182 202
205 213 → 250 243
207 149 → 217 191
209 184 → 212 227
211 132 → 177 182
211 202 → 183 185
211 223 → 223 258
212 148 → 189 183
214 197 → 219 231
215 126 → 237 102
215 141 → 184 149
216 207 → 228 252
216 246 → 229 197
217 124 → 197 140
217 189 → 217 203
217 260 → 243 230
218 113 → 243 99
218 134 → 235 113
218 232 → 223 228
219 220 → 243 167
219 254 → 275 232
222 107 → 202 147
222 195 → 207 216
223 240 → 254 192
224 123 → 220 134
224 259 → 223 241
225 115 → 183 146
225 229 → 236 263
226 95 → 283 96
228 238 → 262 210
229 94 → 223 124
229 264 → 235 244
230 89 → 214 137
230 98 → 204 149
230 253 → 235 267
231 249 → 268 222
232 253 → 272 228
234 77 → 278 48
235 197 → 272 152
235 267 → 293 255
236 76 → 271 48
237 70 → 217 126
237 76 → 295 62
238 254 → 224 229
239 56 → 296 64
239 265 → 298 251
241 267 → 232 264

242 49 → 252 86
242 56 → 280 80
242 226 → 220 245
243 55 → 302 69
243 180 → 198 155
243 263 → 273 250
244 21 → 281 56
244 201 → 276 151
245 13 → 267 44
245 36 → 260 60
245 249 → 265 246
247 8 → 295 42
248 36 → 288 61
248 182 → 210 203
248 242 → 220 222
249 29 → 245 88
249 160 → 203 176
249 192 → 290 156
250 243 → 217 252
251 236 → 245 238
251 245 → 308 257
252 158 → 228 115
253 189 → 294 148
254 18 → 269 48
254 200 → 283 150
255 36 → 254 77
255 196 → 289 155
257 16 → 309 41
258 27 → 267 62
258 203 → 291 157
258 238 → 260 193
260 145 → 208 143
262 213 → 218 215
263 245 → 249 186
264 53 → 318 77
264 145 → 207 133
264 221 → 245 164
265 12 → 270 57
265 249 → 229 263
265 252 → 224 264
266 29 → 309 69
266 30 → 254 75
267 55 → 315 78
268 223 → 251 234
268 254 → 326 254
270 248 → 246 245
271 227 → 243 227
272 68 → 326 89
272 71 → 287 105
273 8 → 270 63
274 235 → 250 229
276 36 → 259 72
276 139 → 226 127
276 254 → 239 247
277 78 → 289 118
278 237 → 336 251
279 138 → 319 111
281 88 → 338 103
283 89 → 340 106
283 241 → 343 239
284 6 → 325 39
286 246 → 333 250
288 41 → 323 83
288 107 → 230 125
288 137 → 257 158
290 108 → 243 95
291 257 → 259 234
294 45 → 260 59
294 257 → 260 243
295 3 → 286 45
295 126 → 292 144
296 125 → 308 122
297 244 → 257 200
299 144 → 301 133
300 139 → 332 104
300 243 → 260 204
301 119 → 290 133
301 132 → 298 140
302 121 → 258 155
304 3 → 279 50
306 50 → 256 79
307 247 → 265 218
310 101 → 352 95
310 102 → 346 118
312 54 → 364 85
312 102 → 363 84
312 252 → 361 232
316 0 → 292 42
317 243 → 356 239
321 94 → 378 77

322 247 → 350 237

324 61 → 342 107

326 90 → 311 122

328 65 → 274 73

328 235 → 347 246

328 242 → 329 248

329 0 → 316 41

333 85 → 311 73

338 232 → 282 253

339 73 → 327 108

340 222 → 288 247

340 228 → 281 239

341 79 → 394 71

342 3 → 304 42

342 72 → 313 119

342 217 → 288 244

343 64 → 401 69

344 84 → 392 51

346 53 → 336 101

348 205 → 321 251

348 210 → 317 257

349 217 → 308 250

352 4 → 336 38

353 47 → 409 69

357 45 → 299 44

361 41 → 411 66

365 6 → 401 54

373 38 → 424 65

379 10 → 410 57

382 35 → 429 70

389 13 → 419 63

396 18 → 383 76

403 21 → 380 47

405 31 → 347 38

410 23 → 369 43

416 30 → 359 40

Frame 1 to Frame 2

31 49 → 33 95
35 56 → 52 95
39 66 → 20 98
40 70 → 15 100
43 57 → 43 95
43 90 → 24 99
44 87 → 26 102
52 59 → 70 95
56 91 → 85 126
58 92 → 31 101
58 97 → 44 115
60 64 → 77 99
64 95 → 54 121
67 80 → 76 106
69 69 → 87 107
69 98 → 89 112
70 81 → 79 114
72 105 → 78 136
73 95 → 53 127
73 104 → 38 109
75 75 → 66 92
79 79 → 99 115
79 107 → 52 127
84 80 → 108 119
84 97 → 46 120
85 107 → 124 130
86 113 → 62 94
88 97 → 107 124
90 85 → 112 122
92 110 → 88 128
94 116 → 56 132
97 207 → 122 175
99 89 → 110 124
99 177 → 126 189
100 179 → 123 185
100 183 → 111 187
101 120 → 64 107
101 186 → 106 197
101 210 → 106 179
102 101 → 95 116
103 100 → 78 114
104 119 → 137 151
105 95 → 83 107
106 164 → 98 195
106 191 → 120 201
107 120 → 145 145
107 177 → 102 181
108 189 → 101 178
108 208 → 110 201
109 160 → 126 198
111 96 → 71 102
111 171 → 96 147
112 121 → 69 132
113 169 → 112 184
113 196 → 128 162
115 102 → 138 136
115 128 → 137 149
115 202 → 109 212
116 107 → 85 139
116 126 → 93 143
116 179 → 106 166
118 105 → 144 141
118 164 → 114 200
118 177 → 143 149
120 130 → 108 173
121 108 → 155 138
122 156 → 164 140
122 159 → 97 195
123 196 → 102 186
124 108 → 152 140
125 130 → 133 138
125 166 → 130 186
125 175 → 102 212
127 112 → 158 139
127 188 → 110 210
128 183 → 99 212
129 136 → 128 152
129 188 → 120 165
130 134 → 113 147
131 112 → 98 116
133 176 → 179 177
135 137 → 158 171
135 149 → 93 137
136 117 → 120 131
136 140 → 136 178
136 182 → 139 177
139 147 → 109 168
142 123 → 106 147
142 148 → 188 146

142 171 → 188 169
142 178 → 112 173
145 142 → 131 183
147 142 → 102 146
147 168 → 116 164
148 146 → 129 166
149 129 → 127 130
151 173 → 192 191
154 146 → 128 171
156 147 → 121 149
160 173 → 122 158
161 136 → 148 175
164 143 → 181 141
165 145 → 126 155
168 167 → 150 169
170 172 → 183 199
171 143 → 141 177
174 148 → 192 142
174 201 → 184 192
176 173 → 148 143
177 141 → 221 130
177 182 → 178 184
180 198 → 202 195
182 202 → 180 203
183 146 → 206 178
183 185 → 218 212
183 186 → 227 197
184 149 → 181 182
185 172 → 180 153
187 148 → 193 187
189 183 → 172 167
190 177 → 146 174
193 191 → 197 146
197 140 → 167 167
198 155 → 182 171
198 195 → 190 178
200 185 → 174 171
200 195 → 177 194
202 147 → 237 170
203 176 → 173 200
204 149 → 187 142
205 212 → 248 220
207 133 → 170 143
207 198 → 242 223
207 216 → 250 228
208 143 → 203 135
208 182 → 202 187
210 203 → 194 194
212 227 → 229 260
214 137 → 195 177
216 198 → 187 186
217 126 → 213 136
217 191 → 208 195
217 203 → 235 244
217 252 → 260 237
218 215 → 254 195
219 231 → 262 233
220 134 → 180 138
220 222 → 263 212
220 245 → 224 261
223 124 → 188 140
223 228 → 264 241
223 241 → 267 244
223 258 → 220 241
224 229 → 270 227
224 264 → 256 232
226 127 → 208 137
228 115 → 216 128
228 252 → 230 253
229 197 → 213 183
229 263 → 262 231
230 125 → 244 165
232 196 → 266 167
232 264 → 225 238
234 175 → 199 146
235 113 → 211 131
235 244 → 262 207
235 267 → 234 264
236 263 → 237 265
237 102 → 235 123
238 174 → 280 176
239 247 → 240 237
243 95 → 224 131
243 99 → 229 122
243 167 → 211 195
243 227 → 251 186
243 230 → 222 256
245 88 → 229 121
245 164 → 205 177
245 238 → 264 215

246 245 → 279 238
249 186 → 254 165
250 229 → 274 233
250 243 → 233 259
251 234 → 287 249
252 86 → 234 123
254 75 → 263 95
254 77 → 248 111
254 192 → 221 219
256 79 → 241 113
257 158 → 248 174
257 200 → 225 229
258 155 → 242 171
259 72 → 245 114
259 234 → 298 258
260 59 → 260 101
260 60 → 296 70
260 193 → 219 189
260 204 → 240 194
260 243 → 259 199
262 210 → 222 197
265 218 → 281 176
265 246 → 273 249
267 44 → 285 71
267 62 → 256 104
268 222 → 253 180
269 48 → 278 85
270 57 → 274 86
270 63 → 252 104
271 48 → 305 74
272 152 → 315 148
272 228 → 258 192
273 250 → 241 251
274 73 → 253 105
275 232 → 253 222
276 151 → 283 176
278 48 → 284 88
279 50 → 284 73
280 80 → 289 123
281 56 → 262 94
281 239 → 241 238
282 253 → 241 247
283 96 → 287 141
283 150 → 284 175
286 45 → 285 87
287 105 → 288 141
288 61 → 313 98
288 244 → 327 265
288 247 → 303 265
289 118 → 285 159
289 155 → 275 170
290 133 → 310 151
290 156 → 334 147
291 157 → 290 163
292 42 → 274 83
292 144 → 301 154
293 255 → 336 255
294 148 → 339 146
295 42 → 275 81
295 62 → 293 72
296 64 → 266 94
298 140 → 336 127
298 251 → 343 256
299 44 → 302 89
301 133 → 295 160
302 69 → 322 109
304 42 → 294 79
308 122 → 338 133
308 250 → 346 246
308 257 → 351 243
309 41 → 288 76
309 69 → 288 104
311 73 → 322 107
311 122 → 344 153
313 119 → 349 146
315 78 → 311 94
316 41 → 294 78
317 257 → 284 258
318 77 → 331 120
319 111 → 343 146
321 251 → 292 255
323 83 → 287 105
325 39 → 348 77
326 89 → 366 80
326 254 → 344 245
327 108 → 365 132
329 248 → 283 246
332 104 → 369 126
333 250 → 335 262
336 38 → 315 74

336 101 → 359 136

336 251 → 342 257

338 103 → 380 120

340 106 → 381 118

342 107 → 323 148

343 239 → 310 263

346 118 → 344 160

347 38 → 325 74

347 246 → 306 265

350 237 → 320 268

352 95 → 394 111

356 239 → 318 263

359 40 → 336 75

361 232 → 332 263

363 84 → 405 91

364 85 → 400 108

369 43 → 374 83

378 77 → 409 107

380 47 → 397 88

383 76 → 420 98

392 51 → 358 78

394 71 → 426 103

401 54 → 413 94

401 69 → 426 106

409 69 → 433 105

410 57 → 382 85

411 66 → 429 107

419 63 → 408 105

424 65 → 390 86

429 70 → 436 113

Frame 2 to Frame 3

15 100 → 76 129
20 98 → 81 126
24 99 → 16 153
26 102 → 89 131
31 101 → 41 135
33 95 → 64 124
38 109 → 24 146
43 95 → 99 135
44 115 → 69 163
46 120 → 52 129
52 95 → 107 138
52 127 → 12 157
53 127 → 59 128
54 121 → 121 145
56 132 → 123 154
62 94 → 86 140
64 107 → 124 143
66 92 → 56 162
69 132 → 137 142
70 95 → 117 143
71 102 → 121 149
76 106 → 73 162
77 99 → 30 141
78 114 → 19 153
78 136 → 18 150
79 114 → 28 152
83 107 → 44 156
85 126 → 145 151
85 139 → 88 164
87 107 → 153 133
88 128 → 155 134
89 112 → 157 133
93 137 → 85 134
93 143 → 147 139
95 116 → 94 132
96 147 → 55 178
97 195 → 159 161
98 116 → 167 127
98 195 → 50 160
99 115 → 167 131
99 212 → 151 165
101 178 → 76 124
102 146 → 37 155
102 181 → 140 141
102 186 → 112 141
102 212 → 135 160
106 147 → 45 134
106 166 → 75 120
106 179 → 70 123
106 197 → 110 172
107 124 → 60 149
108 119 → 143 140
108 173 → 117 182
109 168 → 60 166
109 212 → 176 195
110 124 → 180 130
110 201 → 179 194
110 210 → 132 185
111 187 → 181 193
112 122 → 181 131
112 173 → 134 179
112 184 → 179 181
113 147 → 74 129
114 200 → 113 159
116 164 → 185 177
120 131 → 67 139
120 165 → 64 144
120 201 → 189 185
121 149 → 105 170
122 158 → 190 139
122 175 → 113 166
123 185 → 113 174
124 130 → 132 159
126 155 → 57 164
126 189 → 193 169
126 198 → 193 184
127 130 → 142 152
128 152 → 130 162
128 162 → 197 152
128 171 → 197 184
129 166 → 102 185
130 186 → 93 157
131 183 → 96 138
133 138 → 102 196
136 178 → 142 165
137 149 → 132 148
137 151 → 197 138
138 136 → 203 150
139 177 → 209 187

141 177 → 187 185
143 149 → 108 197
144 141 → 117 171
145 145 → 215 138
146 174 → 119 161
148 143 → 121 178
148 175 → 96 166
150 169 → 103 171
152 140 → 179 163
155 138 → 89 147
158 139 → 124 188
158 171 → 98 165
164 140 → 103 138
167 167 → 176 126
170 143 → 114 162
172 167 → 112 193
173 200 → 172 162
174 171 → 189 133
177 194 → 134 171
178 184 → 219 210
179 177 → 219 208
180 138 → 241 147
180 153 → 122 181
180 203 → 241 237
181 141 → 130 150
181 182 → 187 172
182 171 → 123 167
183 199 → 242 167
184 192 → 249 218
187 142 → 165 132
187 186 → 128 147
188 140 → 196 170
188 146 → 253 165
188 169 → 212 140
190 178 → 165 161
192 142 → 211 190
192 191 → 216 180
193 187 → 262 184
194 194 → 195 136
195 177 → 225 146
197 146 → 135 177
199 146 → 142 166
202 187 → 143 171
202 195 → 196 161
203 135 → 226 168
205 177 → 192 136
206 178 → 259 175
208 137 → 246 188
208 195 → 198 184
211 131 → 202 183
211 195 → 279 214
213 136 → 244 170
213 183 → 228 251
216 128 → 221 197
218 212 → 287 229
219 189 → 242 240
220 241 → 290 234
221 130 → 256 175
221 219 → 236 250
222 197 → 224 251
222 256 → 284 231
224 131 → 264 182
224 261 → 287 251
225 229 → 217 253
225 238 → 226 236
227 197 → 230 193
229 121 → 203 181
229 122 → 163 128
229 260 → 298 249
230 253 → 297 259
233 259 → 303 252
234 123 → 175 132
234 264 → 303 264
235 123 → 185 128
235 244 → 295 254
237 170 → 185 166
237 265 → 305 269
240 194 → 213 206
240 237 → 293 241
241 113 → 198 139
241 238 → 222 184
241 247 → 305 259
241 251 → 297 246
242 171 → 225 225
242 223 → 240 169
244 165 → 271 204
245 114 → 243 143
248 111 → 226 169
248 174 → 225 229
248 220 → 228 189

250 228 → 266 193
251 186 → 219 218
252 104 → 209 147
253 105 → 221 147
253 180 → 238 249
253 222 → 223 262
254 165 → 244 231
254 195 → 223 241
256 104 → 297 161
256 232 → 219 259
258 192 → 218 218
259 199 → 235 240
260 101 → 285 146
260 237 → 318 276
262 94 → 224 138
262 207 → 230 265
262 231 → 236 262
262 233 → 228 252
263 95 → 288 161
263 212 → 209 177
264 215 → 237 191
264 241 → 260 224
266 94 → 233 146
266 167 → 206 175
267 244 → 279 212
270 227 → 232 261
273 249 → 279 220
274 83 → 274 148
274 86 → 257 143
274 233 → 264 221
275 81 → 291 144
275 170 → 246 223
278 85 → 257 148
279 238 → 283 245
280 176 → 258 215
281 176 → 220 196
283 176 → 228 141
283 246 → 273 232
284 73 → 301 141
284 88 → 259 144
284 175 → 277 236
284 258 → 261 223
285 71 → 309 138
285 87 → 292 143
285 159 → 269 227
287 105 → 325 157
287 141 → 236 141
287 249 → 278 242
288 76 → 300 143
288 104 → 334 157
288 141 → 270 191
289 123 → 305 160
290 163 → 275 203
292 255 → 269 233
293 72 → 311 139
294 78 → 306 146
294 79 → 309 146
295 160 → 281 220
296 70 → 320 137
298 258 → 313 265
301 154 → 249 164
302 89 → 340 149
303 265 → 347 282
305 74 → 317 141
306 265 → 325 275
310 151 → 304 161
310 263 → 358 276
311 94 → 306 161
313 98 → 353 155
315 74 → 311 144
315 148 → 259 180
318 263 → 362 276
320 268 → 367 272
322 107 → 364 164
322 109 → 361 161
323 148 → 261 163
325 74 → 320 142
327 265 → 314 268
331 120 → 343 159
332 263 → 352 272
334 147 → 277 145
335 262 → 353 271
336 75 → 327 145
336 127 → 270 149
336 255 → 328 282
338 133 → 276 144
339 146 → 270 161
342 257 → 345 281
343 146 → 411 167
343 256 → 338 274

344 153 → 309 161

344 160 → 280 160

344 245 → 316 276

346 246 → 332 278

348 77 → 338 147

349 146 → 372 165

351 243 → 331 283

358 78 → 327 142

359 136 → 369 166

365 132 → 319 159

366 80 → 337 144

369 126 → 406 161

374 83 → 350 146

380 120 → 351 155

381 118 → 379 163

382 85 → 368 151

390 86 → 361 148

394 111 → 352 159

397 88 → 401 159

400 108 → 427 170

405 91 → 408 162

408 105 → 422 168

409 107 → 433 174

413 94 → 416 165

420 98 → 396 164

426 103 → 396 163

426 106 → 383 155

429 107 → 395 159

433 105 → 388 157

436 113 → 377 152

Frame 3 to Frame 4
12 157 → 38 194
16 153 → 77 161
18 150 → 79 149
19 153 → 14 212
24 146 → 83 148
28 152 → 29 191
30 141 → 25 193
37 155 → 65 201
41 135 → 38 180
44 156 → 19 206
45 134 → 97 152
50 160 → 25 201
52 129 → 109 154
55 178 → 114 190
56 162 → 17 205
57 164 → 34 182
59 128 → 73 163
60 149 → 47 194
60 166 → 68 178
64 124 → 82 154
64 144 → 62 192
67 139 → 127 140
69 163 → 128 149
70 123 → 128 128
73 162 → 44 172
74 129 → 134 135
75 120 → 137 122
76 124 → 138 128
76 129 → 91 156
81 126 → 55 163
85 134 → 144 127
86 140 → 51 168
88 164 → 144 141
89 131 → 148 124
89 147 → 45 175
93 157 → 54 194
94 132 → 68 156
96 138 → 72 193
96 166 → 124 137
98 165 → 60 197
99 135 → 159 128
102 185 → 86 188
102 196 → 143 162
103 138 → 128 147
103 171 → 153 153
105 170 → 112 155
107 138 → 119 158
108 197 → 69 176
110 172 → 159 134
112 141 → 138 167
112 193 → 62 199
113 159 → 116 196
113 166 → 77 192
113 174 → 125 161
114 162 → 63 160
117 143 → 103 188
117 171 → 177 156
117 182 → 93 163
119 161 → 112 177
121 145 → 111 190
121 149 → 156 117
121 178 → 106 151
122 181 → 184 179
123 154 → 152 131
123 167 → 93 188
124 143 → 113 153
124 188 → 104 155
128 147 → 188 148
130 150 → 183 183
130 162 → 93 155
132 148 → 77 159
132 159 → 178 195
132 185 → 104 175
134 171 → 102 174
134 179 → 127 139
135 160 → 194 179
135 177 → 109 187
137 142 → 192 118
140 141 → 198 122
142 152 → 202 158
142 165 → 202 150
142 166 → 109 174
143 140 → 205 137
143 171 → 107 164
145 151 → 201 178
147 139 → 87 154
151 165 → 169 112
153 133 → 144 125
155 134 → 124 179

157 133 → 217 132
159 161 → 172 113
163 128 → 221 137
165 132 → 161 114
165 161 → 205 171
167 127 → 151 152
167 131 → 228 141
172 162 → 230 153
175 132 → 120 141
176 126 → 234 142
176 195 → 231 222
179 163 → 133 138
179 181 → 133 168
179 194 → 226 188
180 130 → 139 156
181 131 → 237 158
181 193 → 125 170
185 128 → 153 151
185 166 → 158 139
185 177 → 130 178
187 172 → 209 148
187 185 → 223 204
189 133 → 236 167
189 185 → 188 175
190 139 → 194 116
192 136 → 173 150
193 169 → 139 172
193 184 → 193 154
195 136 → 180 114
196 161 → 213 128
196 170 → 142 141
197 138 → 227 188
197 152 → 165 140
197 184 → 215 174
198 139 → 173 139
198 184 → 193 169
202 183 → 254 204
203 150 → 187 183
203 181 → 185 188
206 175 → 185 119
209 147 → 163 115
209 177 → 259 211
209 187 → 266 188
211 190 → 179 163
212 140 → 223 192
213 206 → 271 215
215 138 → 190 120
216 180 → 268 206
217 253 → 262 212
218 218 → 273 224
219 208 → 221 213
219 210 → 216 151
219 218 → 218 250
219 259 → 269 222
220 196 → 226 249
221 147 → 197 126
221 197 → 283 200
222 184 → 243 165
223 241 → 279 233
223 262 → 231 246
224 138 → 221 152
224 251 → 277 223
225 146 → 170 120
225 225 → 244 174
225 229 → 223 239
226 168 → 211 129
226 169 → 228 227
226 236 → 253 182
228 141 → 193 164
228 189 → 219 246
228 251 → 289 244
228 252 → 288 241
230 193 → 208 176
230 265 → 279 230
232 261 → 255 217
233 146 → 183 117
235 240 → 293 221
236 141 → 211 173
236 250 → 255 224
236 262 → 297 249
237 191 → 223 242
238 249 → 223 255
240 169 → 227 219
241 147 → 181 143
241 237 → 301 231
242 167 → 205 123
242 240 → 304 238
243 143 → 268 197
244 170 → 225 156
244 231 → 304 231

246 188 → 217 142
246 223 → 305 232
249 164 → 199 135
249 218 → 235 250
253 165 → 199 183
256 175 → 226 179
257 143 → 244 146
257 148 → 213 183
258 215 → 316 224
259 144 → 276 199
259 175 → 224 213
259 180 → 212 184
260 224 → 319 231
261 163 → 257 222
261 223 → 232 243
262 184 → 306 225
264 182 → 310 224
264 221 → 312 259
266 193 → 217 196
269 227 → 308 267
269 233 → 331 234
270 149 → 257 204
270 161 → 218 195
270 191 → 310 227
271 204 → 299 255
273 232 → 309 239
274 148 → 220 137
275 203 → 230 162
276 144 → 250 172
277 145 → 241 177
277 236 → 229 254
278 242 → 321 274
279 212 → 308 247
279 214 → 244 234
279 220 → 339 237
280 160 → 228 179
281 220 → 232 224
283 245 → 313 272
284 231 → 312 262
285 146 → 224 149
287 229 → 318 278
287 251 → 244 238
288 161 → 283 210
290 234 → 346 240
291 144 → 258 185
292 143 → 262 151
293 241 → 353 241
295 254 → 341 290
297 161 → 304 222
297 246 → 359 245
297 259 → 329 288
298 249 → 336 288
300 143 → 270 188
301 141 → 276 196
303 252 → 342 296
303 264 → 327 281
304 161 → 292 219
305 160 → 293 212
305 259 → 348 297
305 269 → 357 302
306 146 → 270 197
306 161 → 287 208
309 138 → 251 147
309 146 → 257 178
309 161 → 297 216
311 139 → 312 160
311 144 → 264 184
313 265 → 360 299
314 268 → 326 284
316 276 → 366 247
317 141 → 260 151
318 276 → 356 295
319 159 → 328 220
320 137 → 317 169
320 142 → 310 190
325 157 → 275 194
325 275 → 354 296
327 142 → 312 159
327 145 → 308 202
328 282 → 373 247
331 283 → 380 251
332 278 → 387 253
334 157 → 330 217
337 144 → 276 156
338 147 → 285 158
338 274 → 394 254
340 149 → 292 161
343 159 → 306 207
345 281 → 401 256
347 282 → 400 249

350 146 → 386 189

351 155 → 346 211

352 159 → 337 215

352 272 → 410 256

353 155 → 384 208

353 271 → 400 244

358 276 → 393 235

361 148 → 313 181

361 161 → 345 211

362 276 → 405 258

364 164 → 386 221

367 272 → 393 231

368 151 → 318 156

369 166 → 317 164

372 165 → 314 173

377 152 → 327 175

379 163 → 319 164

383 155 → 329 174

388 157 → 341 182

395 159 → 349 184

396 163 → 356 188

396 164 → 355 207

401 159 → 359 204

406 161 → 383 203

408 162 → 360 188

411 167 → 365 203

416 165 → 370 190

422 168 → 373 197

427 170 → 372 193

433 174 → 380 192

Frame 4 to Frame 5

14 212 → 45 252
17 205 → 85 225
19 206 → 85 220
25 193 → 50 240
25 201 → 74 232
29 191 → 97 182
34 182 → 104 191
38 180 → 44 239
38 194 → 46 253
44 172 → 60 203
45 175 → 66 232
47 194 → 45 236
51 168 → 121 174
54 194 → 124 208
55 163 → 113 198
60 197 → 129 209
62 192 → 94 232
62 199 → 128 196
63 160 → 131 158
65 201 → 135 187
68 156 → 126 171
68 178 → 119 144
69 176 → 46 237
72 193 → 55 235
73 163 → 140 182
77 159 → 49 224
77 161 → 97 176
77 192 → 142 180
79 149 → 83 195
82 154 → 77 184
83 148 → 91 171
86 188 → 151 174
87 154 → 156 150
91 156 → 108 168
93 155 → 67 194
93 163 → 87 182
93 188 → 82 232
97 152 → 112 195
102 174 → 127 146
103 188 → 93 240
104 155 → 111 213
104 175 → 132 131
106 151 → 63 200
107 164 → 83 211
109 154 → 122 205
109 174 → 126 202
109 187 → 54 213
111 190 → 59 234
112 155 → 183 151
112 177 → 89 233
113 153 → 122 137
114 190 → 79 183
116 196 → 84 194
119 158 → 74 185
120 141 → 188 147
124 137 → 191 117
124 179 → 195 174
125 161 → 104 187
125 170 → 97 170
127 139 → 97 179
127 140 → 129 135
128 128 → 199 122
128 147 → 196 167
128 149 → 129 157
130 178 → 93 232
133 138 → 157 128
133 168 → 99 222
134 135 → 202 135
137 122 → 203 126
138 128 → 201 126
138 167 → 85 174
139 156 → 83 179
139 172 → 133 211
142 141 → 102 169
143 162 → 104 218
144 125 → 119 146
144 127 → 113 152
144 141 → 138 131
148 124 → 218 131
151 152 → 114 155
152 131 → 151 126
153 151 → 130 171
153 153 → 118 210
156 117 → 218 141
158 139 → 157 133
159 128 → 123 162
159 134 → 139 142
161 114 → 227 141
163 115 → 227 137

165 140 → 155 141
169 112 → 234 140
170 120 → 233 148
172 113 → 237 142
173 139 → 109 164
173 150 → 126 140
177 156 → 107 170
178 195 → 115 175
179 163 → 120 155
180 114 → 187 115
181 143 → 120 159
183 117 → 145 122
183 183 → 142 161
184 179 → 130 146
185 119 → 160 116
185 188 → 141 167
187 183 → 153 140
188 148 → 182 164
188 175 → 162 141
190 120 → 122 141
192 118 → 142 141
193 154 → 165 115
193 164 → 193 115
193 169 → 138 124
194 116 → 147 154
194 179 → 151 173
197 126 → 170 114
198 122 → 180 153
199 135 → 149 126
199 183 → 135 169
201 178 → 154 130
202 150 → 134 135
202 158 → 181 141
205 123 → 167 146
205 137 → 137 122
205 171 → 162 167
208 176 → 163 140
209 148 → 150 153
211 129 → 171 115
211 173 → 149 159
212 184 → 175 162
213 128 → 147 134
213 183 → 154 157
215 174 → 169 139
216 151 → 197 157
217 132 → 156 117
217 142 → 181 118
217 196 → 178 141
218 195 → 186 170
218 250 → 233 212
219 246 → 192 181
220 137 → 161 115
221 137 → 262 161
221 152 → 153 145
221 213 → 172 162
223 192 → 207 155
223 204 → 202 179
223 239 → 278 214
223 242 → 227 241
223 255 → 224 250
224 149 → 194 170
224 213 → 205 173
225 156 → 185 182
226 179 → 165 147
226 188 → 178 150
226 249 → 227 198
227 188 → 161 167
227 219 → 216 158
228 141 → 211 141
228 179 → 199 166
228 227 → 228 245
229 254 → 222 193
230 153 → 182 113
230 162 → 220 179
231 222 → 246 155
231 246 → 223 186
232 224 → 186 174
232 243 → 208 181
234 142 → 175 117
235 250 → 218 239
236 167 → 195 156
237 158 → 214 152
241 177 → 213 147
243 165 → 225 204
244 146 → 194 183
244 174 → 235 150
244 234 → 269 172
244 238 → 281 209
250 172 → 214 135
251 147 → 225 210

253 182 → 187 183
254 204 → 207 173
255 217 → 234 239
255 224 → 229 215
257 178 → 211 130
257 204 → 205 172
257 222 → 237 223
258 185 → 200 157
259 211 → 242 233
260 151 → 213 140
262 151 → 200 146
262 212 → 214 173
264 184 → 211 162
266 188 → 228 213
268 197 → 209 157
268 206 → 223 247
269 222 → 222 195
270 188 → 226 208
270 197 → 223 239
271 215 → 218 237
273 224 → 221 243
275 194 → 217 169
276 156 → 225 140
276 196 → 225 197
276 199 → 216 175
277 223 → 218 183
279 230 → 258 244
279 233 → 264 249
283 200 → 226 192
283 210 → 247 152
285 158 → 224 145
287 208 → 230 245
288 241 → 226 235
289 244 → 228 231
292 161 → 265 166
292 219 → 258 157
293 212 → 254 226
293 221 → 235 222
297 216 → 240 221
297 249 → 289 200
299 255 → 269 253
301 231 → 237 215
304 222 → 239 231
304 231 → 275 256
304 238 → 255 236
305 232 → 273 176
306 207 → 246 227
306 225 → 244 227
308 202 → 254 163
308 247 → 267 240
308 267 → 253 240
309 239 → 246 232
310 190 → 254 161
310 224 → 241 235
310 227 → 274 216
312 159 → 243 146
312 160 → 265 167
312 259 → 261 237
312 262 → 329 285
313 181 → 268 220
313 272 → 296 272
314 173 → 254 152
316 224 → 277 180
317 164 → 250 149
317 169 → 268 164
318 156 → 303 212
318 278 → 318 280
319 164 → 302 179
319 231 → 284 182
321 274 → 322 281
326 284 → 280 260
327 175 → 297 190
327 281 → 297 242
328 220 → 264 237
329 174 → 294 185
329 288 → 338 296
330 217 → 287 267
331 234 → 262 222
336 288 → 351 300
337 215 → 281 242
339 237 → 292 243
341 182 → 309 225
341 290 → 311 240
342 296 → 315 279
345 211 → 328 280
346 211 → 301 204
346 240 → 332 289
348 297 → 308 242
349 184 → 300 197
353 241 → 333 295

354 296 → 348 301

355 207 → 287 204

356 188 → 305 218

356 295 → 342 287

357 302 → 307 277

359 204 → 325 266

359 245 → 329 291

360 188 → 289 184

360 299 → 325 288

365 203 → 318 235

366 247 → 337 287

370 190 → 299 186

372 193 → 314 231

373 197 → 304 179

373 247 → 326 268

380 192 → 330 242

380 251 → 336 298

383 203 → 325 239

384 208 → 323 240

386 189 → 336 240

386 221 → 328 250

387 253 → 328 287

393 231 → 327 251

393 235 → 323 236

394 254 → 334 285

400 244 → 346 288

400 249 → 355 303

401 256 → 344 294

405 258 → 342 291

410 256 → 349 288

Frame 5 to Frame 6

44 239 → 105 241
45 236 → 100 253
45 252 → 60 279
46 237 → 64 287
46 253 → 102 240
49 224 → 62 281
50 240 → 84 195
54 213 → 115 202
55 235 → 115 248
59 234 → 61 279
60 203 → 77 264
63 200 → 121 204
66 232 → 114 255
67 194 → 128 208
74 185 → 130 163
74 232 → 133 218
77 184 → 97 228
79 183 → 102 194
82 232 → 141 214
83 179 → 91 210
83 195 → 69 236
83 211 → 145 213
84 194 → 66 250
85 174 → 142 158
85 220 → 145 206
85 225 → 138 216
87 182 → 92 216
89 233 → 67 252
91 171 → 109 167
93 232 → 64 266
93 240 → 68 271
94 232 → 148 202
97 170 → 125 227
97 176 → 84 184
97 179 → 86 198
97 182 → 73 220
99 222 → 151 195
102 169 → 89 183
104 187 → 87 204
104 191 → 78 198
104 218 → 63 264
107 170 → 96 182
108 168 → 75 208
109 164 → 136 130
111 213 → 114 250
112 195 → 99 229
113 152 → 112 153
113 198 → 115 259
114 155 → 155 116
115 175 → 119 238
118 210 → 77 194
119 144 → 114 172
119 146 → 129 142
120 155 → 183 160
120 159 → 121 138
121 174 → 129 156
122 137 → 181 152
122 141 → 177 138
122 205 → 72 222
123 162 → 165 114
124 208 → 86 256
126 140 → 137 116
126 171 → 141 129
126 202 → 124 231
127 146 → 178 119
128 196 → 103 175
129 135 → 190 116
129 157 → 86 189
129 209 → 151 150
130 146 → 108 199
130 171 → 97 178
131 158 → 144 144
132 131 → 173 147
133 211 → 92 254
134 135 → 145 123
135 169 → 121 151
135 187 → 101 176
137 122 → 198 140
138 124 → 200 127
138 131 → 202 129
139 142 → 124 149
140 182 → 112 167
141 167 → 83 183
142 141 → 202 128
142 161 → 193 166
142 180 → 96 189
145 122 → 208 127
147 134 → 208 144
147 154 → 197 128

149 126 → 124 138
149 159 → 107 176
150 153 → 118 142
151 126 → 212 126
151 173 → 168 112
151 174 → 128 139
153 140 → 210 164
153 145 → 141 153
154 130 → 215 133
154 157 → 116 144
155 141 → 206 121
156 117 → 218 126
156 150 → 130 133
157 128 → 162 185
157 133 → 220 132
160 116 → 217 126
161 115 → 124 159
161 167 → 120 169
162 141 → 211 180
162 167 → 209 195
163 140 → 128 128
165 115 → 225 135
165 147 → 207 195
167 146 → 210 178
169 139 → 112 157
170 114 → 207 141
171 115 → 209 161
172 162 → 140 114
175 117 → 235 137
175 162 → 208 212
178 141 → 168 117
178 150 → 130 126
180 153 → 204 169
181 118 → 157 117
181 141 → 140 128
182 113 → 160 137
182 164 → 140 136
183 151 → 245 145
185 182 → 201 155
186 170 → 142 153
186 174 → 125 165
187 115 → 242 140
187 183 → 130 158
188 147 → 136 161
191 117 → 175 116
192 181 → 135 210
193 115 → 149 128
194 170 → 183 110
194 183 → 155 138
195 156 → 149 124
195 174 → 158 124
196 167 → 171 137
197 157 → 157 149
199 122 → 202 174
199 166 → 236 141
200 146 → 155 140
200 157 → 149 120
201 126 → 254 147
202 135 → 160 138
202 179 → 193 120
203 126 → 260 155
205 172 → 149 145
205 173 → 189 114
207 155 → 152 127
207 173 → 162 149
208 181 → 194 174
209 157 → 271 166
211 130 → 249 161
211 141 → 265 160
211 162 → 198 157
213 140 → 265 151
213 147 → 272 169
214 135 → 181 112
214 152 → 160 119
214 173 → 179 172
216 158 → 277 171
216 175 → 159 186
217 169 → 213 231
218 131 → 264 151
218 141 → 274 171
218 183 → 182 171
218 237 → 204 177
218 239 → 205 207
220 179 → 184 166
221 243 → 244 251
222 193 → 217 235
222 195 → 168 178
223 186 → 280 208
223 239 → 216 254
223 247 → 220 261

224 145 → 261 185
224 250 → 200 221
225 140 → 253 167
225 197 → 188 145
225 204 → 202 145
225 210 → 278 218
226 192 → 221 238
226 208 → 202 222
226 235 → 287 246
227 137 → 196 121
227 141 → 260 181
227 198 → 209 233
227 241 → 241 297
228 213 → 187 172
228 231 → 210 231
228 245 → 272 215
229 215 → 267 216
230 245 → 229 224
233 148 → 280 188
233 212 → 225 271
234 140 → 280 181
234 239 → 236 290
235 150 → 254 174
235 222 → 290 248
237 142 → 269 195
237 215 → 188 178
237 223 → 244 221
239 231 → 213 222
240 221 → 197 176
241 235 → 206 182
242 233 → 298 262
243 146 → 280 186
244 227 → 203 221
246 155 → 279 206
246 227 → 201 229
246 232 → 206 190
247 152 → 287 200
250 149 → 286 195
253 240 → 306 272
254 152 → 289 204
254 161 → 197 153
254 163 → 239 223
254 226 → 210 239
255 236 → 231 279
258 157 → 294 209
258 244 → 248 303
261 237 → 206 206
262 161 → 296 211
262 222 → 206 236
264 237 → 298 268
264 249 → 213 248
265 166 → 294 220
265 167 → 291 208
267 240 → 307 278
268 164 → 299 220
268 220 → 232 245
269 172 → 300 222
269 253 → 261 316
273 176 → 299 230
274 216 → 211 225
275 256 → 254 309
277 180 → 303 236
278 214 → 279 232
280 260 → 267 322
281 209 → 298 269
281 242 → 243 252
284 182 → 284 242
287 204 → 231 225
287 267 → 271 329
289 184 → 277 244
289 200 → 309 255
292 243 → 231 242
294 185 → 273 225
296 272 → 278 332
297 190 → 306 249
297 242 → 322 299
299 186 → 302 242
300 197 → 259 218
301 204 → 310 261
302 179 → 301 234
303 212 → 312 269
304 179 → 277 231
305 218 → 314 276
307 277 → 280 335
308 242 → 336 299
309 225 → 320 288
311 240 → 255 258
314 231 → 324 293
315 279 → 268 263
318 235 → 276 206

318 280 → 274 318

322 281 → 281 234

323 236 → 330 296

323 240 → 275 204

325 239 → 327 303

325 266 → 341 316

325 288 → 281 333

326 268 → 341 317

327 251 → 331 308

328 250 → 276 245

328 280 → 314 289

328 287 → 280 248

329 285 → 340 306

329 291 → 275 265

330 242 → 271 232

332 289 → 317 281

333 295 → 276 324

334 285 → 276 302

336 240 → 314 287

336 298 → 276 307

337 287 → 281 294

338 296 → 294 257

342 287 → 282 267

342 291 → 288 261

344 294 → 282 290

346 288 → 288 283

348 301 → 289 283

349 288 → 289 279

351 300 → 297 268

355 303 → 303 268

Frame 6 to Frame 7

60 279 → 72 240
61 279 → 63 246
62 281 → 69 243
63 264 → 82 236
64 266 → 84 237
64 287 → 65 247
66 250 → 104 242
67 252 → 98 236
68 271 → 62 256
69 236 → 73 197
72 222 → 88 210
73 220 → 68 221
75 208 → 63 243
77 194 → 70 205
77 264 → 101 241
78 198 → 65 230
83 183 → 110 170
84 184 → 86 201
84 195 → 83 176
86 189 → 85 199
86 198 → 68 218
86 256 → 92 218
87 204 → 73 193
89 183 → 82 174
91 210 → 130 200
92 216 → 65 237
92 254 → 60 249
96 182 → 109 168
96 189 → 107 155
97 178 → 89 165
97 228 → 123 198
99 229 → 129 207
100 253 → 111 226
101 176 → 117 172
102 194 → 84 185
102 240 → 125 212
103 175 → 90 167
105 241 → 129 208
107 176 → 85 180
108 199 → 96 162
109 167 → 95 173
112 153 → 104 155
112 157 → 149 155
112 167 → 78 183
114 172 → 81 181
114 250 → 120 213
114 255 → 113 221
115 202 → 115 190
115 248 → 118 218
115 259 → 97 231
116 144 → 154 134
118 142 → 101 179
119 238 → 141 207
120 169 → 119 193
121 138 → 95 168
121 151 → 131 122
121 204 → 92 221
124 138 → 156 116
124 149 → 145 124
124 159 → 131 137
124 231 → 139 203
125 165 → 128 157
125 227 → 143 192
128 128 → 126 149
128 139 → 126 162
128 208 → 99 237
129 142 → 123 162
129 156 → 111 188
130 126 → 169 117
130 133 → 166 118
130 158 → 91 168
130 163 → 109 156
133 218 → 149 184
135 210 → 107 230
136 130 → 113 149
136 161 → 138 128
137 116 → 118 145
138 216 → 136 201
140 114 → 177 113
140 128 → 113 155
140 136 → 135 143
141 129 → 150 128
141 153 → 129 140
141 214 → 156 178
142 153 → 127 136
142 158 → 129 148
144 144 → 118 173
145 123 → 158 142
145 206 → 136 166

145 213 → 142 192
148 202 → 145 163
149 120 → 186 117
149 124 → 165 116
149 128 → 121 142
149 145 → 120 147
151 150 → 118 156
151 195 → 128 168
152 127 → 127 133
155 116 → 194 123
155 138 → 136 132
155 140 → 131 125
157 117 → 146 135
157 149 → 148 149
158 124 → 143 136
159 186 → 157 150
160 119 → 200 127
160 137 → 182 124
160 138 → 151 129
162 149 → 138 125
162 185 → 153 145
165 114 → 202 131
168 112 → 168 112
168 117 → 147 125
168 178 → 193 152
171 137 → 154 118
173 147 → 144 156
175 116 → 205 133
177 138 → 137 134
178 119 → 205 143
179 172 → 146 150
181 112 → 211 132
181 152 → 176 119
182 171 → 153 153
183 110 → 205 139
183 160 → 153 136
184 166 → 147 162
187 172 → 173 142
188 145 → 155 123
188 178 → 195 139
189 114 → 218 135
190 116 → 202 151
193 120 → 154 117
193 166 → 167 141
194 174 → 199 164
196 121 → 229 145
197 128 → 198 162
197 153 → 185 145
197 176 → 166 170
198 140 → 174 121
198 157 → 194 188
200 127 → 190 122
200 221 → 195 212
201 155 → 165 149
201 229 → 187 196
202 128 → 236 150
202 129 → 171 151
202 145 → 195 184
202 174 → 161 174
202 222 → 202 200
203 221 → 189 183
204 169 → 183 155
204 177 → 187 167
205 207 → 192 171
206 121 → 237 142
206 182 → 190 147
206 190 → 173 166
206 206 → 192 168
206 236 → 199 199
207 141 → 196 153
207 195 → 184 163
208 127 → 225 135
208 144 → 181 156
208 212 → 189 185
209 161 → 190 128
209 195 → 196 175
209 233 → 209 211
210 164 → 192 166
210 178 → 194 152
210 231 → 191 212
210 239 → 219 214
211 180 → 189 205
211 225 → 196 197
212 126 → 242 145
213 222 → 248 232
213 231 → 190 208
213 248 → 201 225
215 133 → 250 151
216 254 → 219 216
217 126 → 197 138

217 235 → 197 217
218 126 → 248 147
220 132 → 198 124
220 261 → 204 231
221 238 → 257 238
225 135 → 257 156
225 271 → 217 253
229 224 → 199 205
231 225 → 199 206
231 242 → 198 222
231 279 → 213 246
232 245 → 270 244
235 137 → 263 160
236 141 → 268 163
236 290 → 221 260
239 223 → 226 201
241 297 → 230 275
242 140 → 268 170
243 252 → 252 282
244 221 → 217 200
244 251 → 227 272
245 145 → 269 172
248 303 → 247 296
249 161 → 276 177
253 167 → 233 139
254 147 → 228 139
254 174 → 245 162
254 309 → 236 285
255 258 → 224 267
259 218 → 229 221
260 155 → 249 167
260 181 → 275 183
261 185 → 231 199
261 316 → 239 287
264 151 → 279 181
265 151 → 280 189
265 160 → 283 196
267 216 → 266 229
267 322 → 249 290
268 263 → 232 281
269 195 → 255 188
271 166 → 286 203
271 232 → 259 197
271 329 → 247 302
272 169 → 251 153
272 215 → 234 222
273 225 → 245 198
274 171 → 291 203
274 318 → 253 289
275 204 → 262 196
275 265 → 267 243
276 206 → 241 199
276 245 → 258 262
276 302 → 244 298
276 307 → 249 283
276 324 → 251 294
277 171 → 241 156
277 231 → 239 226
277 244 → 248 230
278 218 → 258 192
278 332 → 250 303
279 206 → 304 238
279 232 → 264 241
280 181 → 291 211
280 186 → 254 180
280 188 → 252 172
280 208 → 257 196
280 248 → 270 217
280 335 → 255 308
281 234 → 260 208
281 294 → 241 293
281 333 → 252 304
282 267 → 252 278
282 290 → 321 278
284 242 → 268 247
286 195 → 274 227
287 200 → 298 225
287 246 → 265 232
288 261 → 253 272
288 283 → 326 295
289 204 → 266 197
289 279 → 310 260
289 283 → 307 256
290 248 → 261 258
291 208 → 262 220
294 209 → 260 211
294 220 → 268 218
294 257 → 263 252
296 211 → 306 244
297 268 → 331 288

298 262 → 301 236

298 268 → 299 228

298 269 → 281 235

299 220 → 287 244

299 230 → 285 198

300 222 → 297 221

301 234 → 294 208

302 242 → 275 225

303 236 → 281 233

303 268 → 303 249

306 249 → 269 244

306 272 → 293 253

307 278 → 292 250

309 255 → 295 218

310 261 → 300 231

312 269 → 301 241

314 276 → 330 296

314 287 → 305 249

314 289 → 306 270

317 281 → 299 262

320 288 → 337 291

322 299 → 347 302

324 293 → 336 300

327 303 → 341 298

330 296 → 312 268

331 308 → 317 273

336 299 → 312 279

340 306 → 325 285

341 316 → 321 288

341 317 → 319 287

Frame 7 to Frame 8

60 249 → 84 226
62 256 → 76 227
63 243 → 96 228
63 246 → 91 228
65 230 → 92 218
65 237 → 98 229
65 247 → 99 236
68 218 → 87 196
68 221 → 86 198
69 243 → 92 222
70 205 → 64 239
72 240 → 97 226
73 193 → 87 169
73 197 → 69 229
78 183 → 75 181
81 181 → 116 177
82 174 → 98 151
82 236 → 88 211
83 176 → 68 206
84 185 → 111 168
84 237 → 66 217
85 180 → 83 159
85 199 → 86 183
86 201 → 89 165
88 210 → 87 181
89 165 → 124 156
90 167 → 71 194
91 168 → 91 160
92 218 → 63 227
92 221 → 65 218
95 168 → 90 151
95 173 → 129 170
96 162 → 90 157
97 231 → 87 201
98 236 → 64 232
99 237 → 111 210
101 179 → 135 186
101 241 → 104 218
104 155 → 121 174
104 242 → 106 217
107 155 → 79 170
107 230 → 118 202
109 156 → 88 153
109 168 → 128 139
110 170 → 87 156
111 188 → 137 170
111 226 → 128 195
113 149 → 124 176
113 155 → 143 141
113 221 → 126 195
115 190 → 140 164
117 172 → 98 144
118 145 → 101 147
118 156 → 111 143
118 173 → 128 153
118 218 → 146 197
119 193 → 133 171
120 147 → 109 147
120 213 → 143 193
121 142 → 104 145
123 162 → 93 145
123 198 → 143 168
125 212 → 147 186
126 149 → 119 142
126 162 → 113 156
127 133 → 106 155
127 136 → 129 144
128 157 → 111 147
128 168 → 124 140
129 140 → 155 120
129 148 → 110 161
129 207 → 150 184
129 208 → 140 188
130 200 → 112 174
131 122 → 164 117
131 125 → 166 121
131 137 → 125 142
135 143 → 104 151
136 132 → 169 118
136 166 → 121 138
136 201 → 136 190
137 134 → 114 140
138 125 → 162 127
138 128 → 147 128
139 203 → 154 178
141 207 → 131 182
142 192 → 152 158
143 136 → 131 142
143 192 → 145 164

144 156 → 127 178
145 124 → 177 116
145 163 → 148 131
146 135 → 145 149
146 150 → 160 118
147 125 → 148 127
147 162 → 135 148
148 149 → 119 147
149 155 → 126 164
149 184 → 156 149
150 128 → 143 143
151 129 → 136 132
153 136 → 129 131
153 145 → 132 161
153 153 → 118 149
154 117 → 172 126
154 118 → 157 135
154 134 → 136 122
155 123 → 137 139
156 116 → 182 125
156 178 → 184 165
157 150 → 182 163
158 142 → 126 154
161 174 → 143 160
165 116 → 197 132
165 149 → 155 125
166 118 → 193 126
166 170 → 160 153
167 141 → 138 127
168 112 → 192 130
169 117 → 193 132
171 151 → 199 138
173 142 → 140 133
173 166 → 158 133
174 121 → 202 136
176 119 → 208 133
177 113 → 207 131
181 156 → 151 136
182 124 → 210 140
183 155 → 148 149
184 163 → 151 152
185 145 → 151 134
186 117 → 213 135
187 167 → 167 144
187 196 → 189 174
189 183 → 198 174
189 185 → 162 171
189 205 → 187 170
190 122 → 210 134
190 128 → 220 137
190 147 → 155 148
190 208 → 190 172
191 212 → 192 179
192 166 → 203 148
192 168 → 172 156
192 171 → 170 164
193 152 → 175 124
194 123 → 226 135
194 152 → 159 145
194 188 → 189 155
195 139 → 190 156
195 184 → 196 156
195 212 → 183 180
196 153 → 176 163
196 175 → 195 143
196 197 → 178 174
197 138 → 183 150
197 217 → 214 189
198 124 → 230 141
198 162 → 172 155
198 222 → 184 190
199 164 → 165 169
199 199 → 189 178
199 205 → 180 178
199 206 → 210 173
200 127 → 231 142
201 225 → 187 195
202 131 → 227 140
202 151 → 177 146
202 200 → 188 168
204 231 → 194 212
205 133 → 236 145
205 139 → 181 130
205 143 → 186 164
209 211 → 197 178
211 132 → 194 145
213 246 → 199 223
217 200 → 205 173
217 253 → 201 225
218 135 → 251 150

219 214 → 189 201
219 216 → 206 184
221 260 → 205 233
224 267 → 256 250
225 135 → 242 148
226 201 → 193 209
227 272 → 210 244
228 139 → 245 157
229 145 → 259 160
229 221 → 261 208
230 275 → 213 246
231 199 → 257 211
232 281 → 217 253
233 139 → 262 160
234 222 → 259 204
236 150 → 268 166
236 285 → 254 259
237 142 → 241 150
239 226 → 234 203
239 287 → 247 293
241 156 → 209 143
241 199 → 249 193
241 293 → 253 268
242 145 → 267 170
244 298 → 250 291
245 162 → 248 147
245 198 → 218 176
247 296 → 252 262
247 302 → 251 272
248 147 → 271 173
248 230 → 263 198
248 232 → 255 203
249 167 → 275 178
249 283 → 246 288
249 290 → 248 285
250 151 → 254 173
250 303 → 249 275
251 153 → 276 178
251 294 → 230 272
252 172 → 223 176
252 278 → 223 263
252 282 → 258 247
252 304 → 237 281
253 272 → 258 236
253 289 → 227 267
254 180 → 250 154
255 188 → 221 192
257 156 → 279 180
257 196 → 248 163
257 238 → 245 213
258 192 → 254 196
258 262 → 255 226
259 197 → 251 168
260 208 → 284 202
260 211 → 228 198
261 258 → 294 252
262 196 → 230 180
262 220 → 260 233
263 160 → 276 186
263 252 → 272 219
264 241 → 265 210
265 232 → 298 237
266 197 → 236 181
266 229 → 258 231
267 243 → 302 244
268 163 → 281 192
268 170 → 241 185
268 218 → 268 202
268 247 → 300 261
269 172 → 252 184
269 244 → 250 219
270 217 → 240 209
270 244 → 296 223
274 227 → 297 230
275 183 → 262 199
275 225 → 263 235
276 177 → 251 175
279 181 → 292 213
280 189 → 288 210
281 233 → 258 220
281 235 → 257 219
283 196 → 290 218
285 198 → 299 222
286 203 → 257 202
287 244 → 273 217
291 203 → 287 204
291 211 → 268 207
292 250 → 274 221
293 253 → 317 278
294 208 → 301 240

295 218 → 264 210

297 221 → 276 230

298 225 → 282 198

299 228 → 305 245

299 262 → 287 244

300 231 → 269 221

301 236 → 308 254

301 241 → 319 268

303 249 → 297 231

304 238 → 305 249

305 249 → 329 275

306 244 → 294 216

306 270 → 337 277

307 256 → 293 254

310 260 → 300 263

312 268 → 340 287

312 279 → 346 288

317 273 → 350 280

319 287 → 308 271

321 278 → 344 278

321 288 → 356 287

325 285 → 311 260

326 295 → 359 280

330 296 → 363 287

331 288 → 315 264

336 300 → 367 282

337 291 → 324 270

341 298 → 333 285

347 302 → 327 284

350 306 → 324 281

Frame 8 to Frame 9

299

63 227 → 93 195

64 232 → 32 202

64 239 → 86 202

65 218 → 32 214

66 217 → 34 218

68 206 → 30 204

69 229 → 109 192

71 194 → 31 211

75 181 → 41 179

76 227 → 114 187

79 170 → 39 203

83 159 → 53 163

84 226 → 107 177

86 183 → 35 207

86 198 → 37 189

87 156 → 59 155

87 169 → 44 203

87 181 → 61 153

87 196 → 51 166

87 201 → 32 198

88 153 → 94 146

88 211 → 78 170

89 165 → 39 186

90 151 → 47 171

90 157 → 58 203

91 160 → 80 131

91 228 → 124 183

92 218 → 51 202

92 222 → 107 169

93 145 → 79 190

96 228 → 128 182

97 226 → 117 178

98 144 → 65 147

98 151 → 77 135

98 229 → 65 202

99 236 → 106 189

101 147 → 92 132

104 145 → 68 145

104 151 → 125 159

104 218 → 84 213

106 155 → 81 128

106 217 → 140 174

109 147 → 151 134

110 161 → 80 154

111 143 → 130 148

111 147 → 130 155

111 168 → 79 206

111 210 → 79 197

112 174 → 72 140

113 156 → 81 131

114 140 → 88 127

116 177 → 83 211

118 149 → 117 152

118 202 → 137 162

119 142 → 115 130

119 147 → 78 184

121 138 → 124 175

121 174 → 112 161

124 140 → 125 142

124 156 → 144 161

124 176 → 82 140

125 142 → 101 153

126 154 → 105 179

126 164 → 133 132

126 195 → 81 207

127 178 → 79 157

128 139 → 96 128

128 153 → 88 138

128 195 → 72 203

129 131 → 185 137

129 144 → 183 134

129 170 → 79 169

131 142 → 109 129

131 182 → 186 171

132 161 → 80 144

133 171 → 150 159

135 148 → 106 132

135 186 → 189 186

136 122 → 186 131

136 132 → 192 136

136 190 → 190 179

137 139 → 115 160

137 170 → 123 161

138 127 → 144 133

140 133 → 96 146

140 164 → 153 135

140 188 → 115 170

143 141 → 115 133

143 143 → 89 137
143 160 → 126 135
143 168 → 100 188
143 193 → 92 197
145 149 → 146 165
145 164 → 107 161
146 197 → 131 156
147 128 → 202 141
147 186 → 125 136
148 127 → 120 157
148 131 → 103 155
148 149 → 115 167
150 184 → 197 165
151 134 → 138 178
151 136 → 139 148
151 152 → 120 151
152 158 → 119 166
154 178 → 162 161
155 120 → 140 133
155 125 → 123 155
155 148 → 181 179
156 149 → 118 157
157 135 → 129 131
158 133 → 201 137
159 145 → 128 146
160 118 → 142 168
160 153 → 121 172
162 127 → 127 132
162 171 → 140 162
164 117 → 113 134
165 169 → 149 155
166 121 → 215 148
167 144 → 176 134
169 118 → 185 163
170 164 → 155 134
172 126 → 221 151
172 155 → 138 136
172 156 → 129 137
175 124 → 123 144
176 163 → 131 140
177 116 → 223 141
177 146 → 180 169
178 174 → 144 137
180 178 → 141 139
181 130 → 232 146
182 125 → 133 145
182 163 → 136 143
183 150 → 137 148
183 180 → 238 192
184 165 → 160 131
184 190 → 155 162
186 164 → 162 130
187 170 → 147 140
187 195 → 146 159
188 168 → 189 168
189 155 → 181 134
189 174 → 241 160
189 178 → 183 185
189 201 → 176 158
190 156 → 144 141
190 172 → 232 183
192 130 → 242 150
192 179 → 161 153
193 126 → 243 149
193 132 → 149 163
193 209 → 210 175
194 145 → 189 147
194 212 → 169 163
195 143 → 227 153
196 156 → 147 150
197 132 → 197 185
197 178 → 247 203
198 174 → 149 148
199 138 → 165 133
199 223 → 193 180
201 225 → 228 220
202 136 → 251 155
203 148 → 183 171
205 173 → 173 129
205 233 → 184 181
206 184 → 192 166
207 131 → 251 163
208 133 → 246 162
209 143 → 205 144
210 134 → 187 163
210 140 → 260 160
210 173 → 170 134
210 244 → 215 190
213 135 → 194 152
213 246 → 268 233

214 189 → 199 135
217 253 → 225 222
218 176 → 172 155
220 137 → 209 141
221 192 → 176 166
223 176 → 190 172
223 263 → 257 220
226 135 → 268 166
227 140 → 267 171
227 267 → 270 231
228 198 → 222 168
230 141 → 272 174
230 180 → 193 142
230 272 → 251 226
231 142 → 195 141
234 203 → 214 165
236 145 → 280 177
236 181 → 209 139
237 281 → 267 237
240 209 → 206 176
241 150 → 232 155
241 185 → 207 144
242 148 → 275 185
245 157 → 200 153
245 213 → 198 184
246 288 → 269 237
247 293 → 270 244
248 147 → 205 158
248 163 → 218 169
248 285 → 227 235
249 193 → 198 178
249 275 → 233 223
250 154 → 281 197
250 219 → 209 182
250 291 → 291 252
251 150 → 214 152
251 168 → 221 143
251 175 → 216 160
251 272 → 222 232
252 184 → 202 175
252 262 → 224 225
253 268 → 217 227
254 173 → 287 216
254 196 → 218 201
254 259 → 224 224
255 203 → 205 181
255 226 → 225 183
256 250 → 311 256
257 202 → 221 175
257 211 → 224 231
257 219 → 220 177
258 220 → 294 252
258 231 → 216 236
258 236 → 226 230
258 247 → 230 216
259 160 → 208 161
259 204 → 228 232
260 233 → 278 196
261 208 → 226 177
262 160 → 215 140
262 199 → 240 230
263 198 → 237 156
263 235 → 302 250
264 210 → 216 192
265 210 → 216 182
267 170 → 273 210
268 166 → 216 148
268 202 → 224 174
268 207 → 222 184
269 221 → 272 228
271 173 → 281 181
272 219 → 273 196
273 217 → 233 233
274 221 → 236 221
275 178 → 287 223
276 178 → 237 188
276 186 → 254 167
276 230 → 244 201
279 180 → 261 169
281 192 → 274 183
282 198 → 230 179
284 202 → 275 176
287 204 → 250 210
287 244 → 253 213
288 210 → 260 225
290 218 → 275 201
292 213 → 273 216
293 254 → 346 272
294 216 → 281 205
294 252 → 342 264

296 223 → 274 198

297 230 → 248 212

297 231 → 261 228

298 237 → 271 222

299 222 → 277 236

300 261 → 353 273

300 263 → 300 258

301 240 → 349 267

302 244 → 295 237

305 245 → 284 211

305 249 → 279 238

308 254 → 290 221

308 271 → 298 245

311 260 → 293 229

315 264 → 292 228

317 278 → 298 239

319 268 → 323 273

324 270 → 365 267

324 281 → 360 270

327 284 → 357 268

329 275 → 284 244

333 285 → 338 273

337 277 → 331 272

340 287 → 337 268

344 278 → 329 267

346 288 → 309 264

350 280 → 306 255

356 287 → 309 262

359 280 → 321 264

363 287 → 318 270

367 282 → 317 261

Frame 9 to Frame 10

30 204 → 9 175
31 211 → 3 196
32 198 → 6 191
32 202 → 9 176
32 214 → 0 200
34 218 → 24 181
35 207 → 4 190
37 189 → 20 155
39 186 → 20 152
39 203 → 4 187
41 179 → 27 143
44 203 → 12 186
47 171 → 27 144
51 166 → 14 163
51 202 → 18 183
53 163 → 33 132
58 203 → 29 178
59 155 → 33 131
61 153 → 26 141
65 147 → 40 121
65 202 → 38 178
68 145 → 43 118
72 140 → 48 114
72 203 → 55 182
77 135 → 51 111
78 170 → 47 179
78 184 → 56 165
79 157 → 57 130
79 169 → 56 147
79 190 → 55 164
79 197 → 118 193
79 206 → 56 182
80 131 → 59 103
80 144 → 56 113
80 154 → 58 122
81 128 → 59 97
81 131 → 55 102
81 207 → 58 179
82 140 → 58 110
83 211 → 107 201
84 213 → 110 199
86 202 → 120 184
88 127 → 66 99
88 138 → 70 110
89 137 → 72 106
92 132 → 69 112
92 197 → 119 190
93 195 → 103 174
94 146 → 55 146
96 128 → 63 109
96 146 → 77 113
100 188 → 136 183
101 153 → 88 117
103 155 → 68 171
105 179 → 67 170
106 132 → 73 124
106 189 → 141 173
107 161 → 77 141
107 169 → 96 170
107 177 → 102 191
109 129 → 79 109
109 192 → 84 171
112 161 → 130 153
113 134 → 148 141
114 187 → 93 171
115 130 → 84 111
115 133 → 76 130
115 160 → 111 166
115 167 → 99 176
115 170 → 80 153
117 152 → 97 119
117 178 → 88 163
118 157 → 84 159
119 166 → 117 170
120 151 → 147 169
120 157 → 91 170
121 172 → 85 172
123 144 → 104 121
123 155 → 111 162
123 161 → 144 133
124 175 → 137 145
124 183 → 135 176
125 136 → 95 114
125 142 → 161 136
125 159 → 157 140
126 135 → 109 118
127 132 → 97 116
128 146 → 111 120
128 182 → 122 156

129 131 → 160 141
129 137 → 146 139
130 148 → 104 165
130 155 → 103 183
131 140 → 112 124
131 156 → 114 182
133 132 → 170 141
133 145 → 139 137
136 143 → 174 139
137 148 → 115 166
137 162 → 103 166
138 136 → 111 159
138 178 → 125 154
139 148 → 145 135
140 133 → 122 125
140 162 → 132 133
140 174 → 115 157
141 139 → 140 167
142 168 → 117 184
144 133 → 130 166
144 137 → 124 129
144 141 → 133 129
144 161 → 144 170
146 159 → 137 155
146 165 → 127 151
147 140 → 184 144
147 150 → 136 175
149 148 → 155 165
149 155 → 127 126
149 163 → 138 152
150 159 → 119 151
151 134 → 185 143
153 135 → 126 161
155 134 → 188 137
155 162 → 125 164
160 131 → 198 129
161 153 → 137 143
162 130 → 197 128
162 161 → 176 143
165 133 → 158 136
169 163 → 145 138
170 134 → 203 124
172 155 → 210 164
173 129 → 206 113
176 134 → 213 123
176 158 → 211 169
176 166 → 208 157
180 169 → 164 164
181 134 → 217 137
181 179 → 218 180
183 134 → 215 126
183 171 → 146 163
183 185 → 176 182
184 181 → 161 159
185 137 → 221 142
185 163 → 155 160
186 131 → 217 113
186 171 → 218 178
187 163 → 225 158
189 147 → 219 123
189 168 → 178 197
189 186 → 227 185
190 172 → 226 182
190 179 → 225 165
192 136 → 230 132
192 166 → 177 182
193 142 → 225 129
193 180 → 228 193
194 152 → 212 124
195 141 → 222 114
197 165 → 174 138
197 185 → 206 198
198 178 → 195 186
198 184 → 213 188
199 135 → 226 116
200 153 → 224 124
201 137 → 239 145
202 141 → 231 118
202 175 → 171 162
205 144 → 234 138
205 158 → 236 179
205 181 → 172 168
206 176 → 183 167
207 144 → 237 120
208 161 → 179 174
209 139 → 244 123
209 141 → 246 153
209 182 → 186 188
210 175 → 207 159
214 152 → 199 177

214 165 → 244 186
215 140 → 210 113
215 148 → 246 171
215 190 → 202 178
216 148 → 234 181
216 160 → 187 180
216 182 → 183 168
216 192 → 180 194
216 236 → 229 249
217 227 → 223 247
218 169 → 192 176
218 201 → 198 187
220 177 → 188 178
221 143 → 253 163
221 151 → 247 172
221 175 → 258 185
222 168 → 258 179
222 184 → 184 192
222 232 → 217 242
223 141 → 252 126
224 174 → 194 151
224 224 → 225 186
224 225 → 215 249
224 231 → 229 241
225 183 → 259 185
225 222 → 216 234
226 177 → 193 171
226 230 → 213 208
227 153 → 257 168
227 235 → 264 237
228 220 → 211 193
228 232 → 218 249
230 179 → 222 150
230 216 → 213 236
232 146 → 263 131
232 155 → 263 173
232 183 → 226 189
233 223 → 270 213
233 233 → 228 225
236 221 → 215 245
237 156 → 265 178
237 188 → 203 189
238 192 → 205 183
240 230 → 219 210
241 160 → 264 181
242 150 → 280 144
243 149 → 274 138
244 201 → 282 198
246 162 → 273 188
247 203 → 211 188
248 212 → 220 225
250 210 → 211 206
251 155 → 289 155
251 163 → 290 164
251 226 → 220 245
253 213 → 224 219
254 167 → 293 166
257 220 → 244 229
260 160 → 294 168
260 225 → 222 230
261 169 → 292 191
261 228 → 261 198
267 171 → 292 201
267 237 → 238 241
268 166 → 293 160
268 233 → 294 242
269 237 → 249 239
270 231 → 276 245
270 244 → 244 216
271 222 → 263 233
272 174 → 292 181
272 228 → 241 216
273 196 → 281 198
273 210 → 252 227
273 216 → 240 215
274 183 → 293 209
274 198 → 242 187
275 176 → 291 201
275 185 → 290 207
275 201 → 270 207
277 236 → 246 221
278 196 → 273 186
279 238 → 246 239
280 177 → 285 148
281 181 → 290 210
281 197 → 266 195
281 205 → 251 215
284 211 → 292 238
284 244 → 285 252
287 216 → 258 225

287 223 → 268 197

290 221 → 288 252

291 252 → 272 219

292 228 → 256 229

293 229 → 255 223

294 252 → 276 222

295 237 → 281 231

298 239 → 273 211

298 245 → 279 228

300 258 → 269 239

302 250 → 282 227

306 255 → 273 246

309 262 → 346 261

309 264 → 287 234

311 256 → 346 250

317 261 → 354 249

318 270 → 349 260

321 264 → 356 253

323 273 → 298 247

329 267 → 360 250

331 272 → 299 256

337 268 → 364 248

338 273 → 309 252

342 264 → 307 258

346 272 → 319 254

349 267 → 313 260

353 273 → 338 253

357 268 → 329 263

360 270 → 329 262

365 267 → 329 256

Frame 10 to Frame 11

0 200 → 99 196
3 196 → 100 182
4 187 → 49 97
4 190 → 102 171
6 191 → 106 206
9 175 → 108 177
9 176 → 108 161
12 186 → 113 190
14 163 → 115 166
18 183 → 115 164
20 152 → 114 158
20 155 → 120 160
24 181 → 121 172
26 141 → 54 78
27 143 → 126 154
27 144 → 126 162
29 178 → 38 91
33 131 → 56 91
33 132 → 134 131
38 178 → 137 173
40 121 → 140 135
43 118 → 143 133
47 179 → 142 173
48 114 → 145 126
51 111 → 147 141
55 102 → 42 76
55 146 → 132 129
55 164 → 141 146
55 182 → 150 170
56 113 → 153 140
56 147 → 131 173
56 165 → 113 179
56 182 → 69 99
57 130 → 157 145
58 110 → 131 113
58 122 → 158 135
58 179 → 40 88
59 97 → 147 137
59 103 → 87 112
63 109 → 36 85
66 99 → 159 134
67 170 → 161 169
68 171 → 62 97
69 112 → 166 139
70 110 → 130 163
72 106 → 165 145
73 124 → 167 141
76 130 → 113 105
77 113 → 51 70
77 141 → 79 100
79 109 → 126 191
80 153 → 128 152
84 111 → 77 89
84 159 → 184 151
84 171 → 90 101
85 172 → 106 120
88 117 → 178 146
88 163 → 122 126
91 170 → 189 176
93 171 → 125 125
95 114 → 99 118
96 170 → 80 108
97 116 → 110 118
97 119 → 191 146
99 176 → 76 82
102 191 → 91 96
103 166 → 199 142
103 174 → 201 181
103 183 → 202 192
104 121 → 105 102
104 165 → 64 81
107 201 → 204 179
109 118 → 131 172
110 199 → 209 206
111 120 → 209 130
111 159 → 46 92
111 162 → 71 84
111 166 → 210 181
112 124 → 200 171
114 182 → 99 104
115 157 → 98 99
115 166 → 112 201
117 170 → 122 108
117 184 → 216 201
118 193 → 216 181
119 151 → 144 148
119 190 → 220 191
120 184 → 102 115
122 125 → 217 117

122 156 → 54 99
124 129 → 134 178
125 154 → 57 92
125 164 → 222 186
126 161 → 219 122
127 126 → 182 190
127 151 → 82 106
130 153 → 219 110
130 166 → 228 189
132 133 → 159 164
133 129 → 225 93
135 176 → 233 174
136 175 → 236 189
136 183 → 220 233
137 143 → 132 115
137 145 → 63 87
137 155 → 159 148
138 152 → 223 113
139 137 → 70 104
140 167 → 238 170
141 173 → 239 169
144 133 → 180 184
144 170 → 242 162
145 135 → 134 147
145 138 → 62 99
146 139 → 209 194
146 163 → 247 160
147 169 → 83 92
148 141 → 161 142
155 160 → 129 182
155 165 → 253 155
157 140 → 113 124
158 136 → 72 101
160 141 → 121 122
161 136 → 129 130
161 159 → 194 176
164 164 → 264 151
170 141 → 117 122
171 162 → 266 150
172 168 → 188 190
174 138 → 231 70
174 139 → 93 111
176 143 → 93 115
176 182 → 183 170
177 182 → 270 215
178 197 → 273 226
179 174 → 275 147
180 194 → 275 228
183 167 → 177 175
183 168 → 281 146
184 144 → 164 140
184 192 → 278 224
185 143 → 109 107
186 188 → 273 219
187 180 → 263 203
188 137 → 111 172
188 178 → 263 147
192 176 → 152 130
193 171 → 228 88
194 151 → 121 110
195 186 → 256 121
197 128 → 150 144
198 129 → 245 73
198 187 → 193 186
199 177 → 196 158
202 178 → 233 85
203 124 → 288 93
203 189 → 282 250
205 183 → 228 85
206 113 → 296 75
206 198 → 153 146
207 159 → 150 165
208 157 → 280 90
210 113 → 240 79
210 164 → 179 196
211 169 → 134 186
211 188 → 119 196
211 193 → 110 191
211 206 → 284 232
212 124 → 267 69
213 123 → 241 88
213 188 → 259 127
213 208 → 272 221
213 236 → 301 254
215 126 → 251 71
215 245 → 312 255
215 249 → 308 246
216 234 → 291 253
217 113 → 278 70
217 137 → 131 188

217 242 → 318 245
218 178 → 137 150
218 180 → 238 83
218 249 → 318 253
219 123 → 238 78
219 210 → 124 177
220 225 → 276 248
220 245 → 295 245
221 142 → 141 167
222 114 → 305 78
222 150 → 195 190
222 230 → 281 236
223 247 → 317 246
224 124 → 313 81
224 219 → 289 241
225 129 → 287 73
225 158 → 198 186
225 165 → 136 133
225 186 → 245 97
226 116 → 142 136
226 182 → 219 212
226 189 → 304 125
227 185 → 139 143
228 193 → 299 128
228 225 → 325 252
229 241 → 271 244
229 249 → 329 242
230 132 → 137 121
231 118 → 171 172
234 138 → 246 69
234 181 → 174 195
236 179 → 295 98
237 120 → 175 187
238 241 → 337 247
239 145 → 256 70
240 215 → 339 234
241 216 → 169 147
242 187 → 315 120
244 123 → 195 188
244 186 → 322 122
244 216 → 331 249
244 229 → 263 141
246 153 → 236 70
246 171 → 229 94
246 221 → 261 138
246 239 → 261 195
247 172 → 226 251
249 239 → 348 230
251 215 → 257 153
252 126 → 352 113
252 227 → 352 238
253 163 → 263 83
255 223 → 345 243
256 229 → 259 129
257 168 → 232 78
258 179 → 222 102
258 185 → 323 118
258 225 → 358 231
259 185 → 332 121
261 198 → 320 120
263 131 → 358 110
263 173 → 260 82
263 233 → 358 225
264 181 → 179 198
264 237 → 258 199
265 178 → 250 79
266 195 → 209 199
268 197 → 179 181
269 239 → 191 176
270 207 → 190 148
270 213 → 308 122
272 219 → 256 186
273 186 → 272 86
273 188 → 342 117
273 211 → 217 248
273 246 → 252 187
274 138 → 366 108
276 222 → 190 171
276 245 → 254 223
279 228 → 252 183
280 144 → 372 106
281 198 → 303 102
281 231 → 248 221
282 198 → 239 241
282 227 → 249 232
285 148 → 364 101
285 252 → 219 219
287 234 → 248 158
288 252 → 245 176
289 155 → 357 97

290 164 → 348 94

290 207 → 311 109

290 210 → 219 248

291 201 → 214 239

292 181 → 215 118

292 191 → 214 213

292 201 → 222 253

292 238 → 228 245

293 160 → 321 84

293 166 → 339 90

293 209 → 227 245

294 168 → 330 87

294 242 → 228 229

298 247 → 227 256

299 256 → 234 247

307 258 → 233 239

309 252 → 231 250

313 260 → 238 240

319 254 → 234 255

329 256 → 244 239

329 262 → 240 237

329 263 → 247 223

338 253 → 247 239

346 250 → 251 228

346 261 → 256 224

349 260 → 264 210

354 249 → 263 205

356 253 → 262 232

360 250 → 260 237

364 248 → 266 240

Frame 11 to Frame 0

36 85 → 115 39
38 91 → 31 72
40 88 → 130 85
42 76 → 133 65
46 92 → 63 11
49 97 → 93 104
51 70 → 81 32
54 78 → 44 25
54 99 → 99 43
56 91 → 113 114
57 92 → 25 79
62 97 → 124 48
62 99 → 30 49
63 87 → 107 39
64 81 → 30 83
69 99 → 83 50
70 104 → 155 81
71 84 → 38 31
72 101 → 57 15
76 82 → 85 35
77 89 → 168 90
79 100 → 167 92
80 108 → 153 150
82 106 → 49 74
83 92 → 35 86
87 112 → 69 25
90 101 → 98 83
91 96 → 179 111
93 111 → 108 42
93 115 → 30 64
98 99 → 124 38
99 104 → 45 84
99 118 → 183 149
99 196 → 142 133
100 182 → 125 178
102 115 → 182 150
102 171 → 59 91
105 102 → 184 127
106 120 → 61 64
106 206 → 197 196
108 161 → 72 83
108 177 → 199 182
109 107 → 46 87
110 118 → 101 38
110 191 → 199 188
111 172 → 69 96
112 201 → 194 198
113 105 → 79 98
113 124 → 44 76
113 179 → 195 142
113 190 → 201 177
114 158 → 147 77
115 164 → 123 121
115 166 → 204 157
117 122 → 87 82
119 196 → 161 173
120 160 → 140 150
121 110 → 197 143
121 122 → 132 38
121 172 → 207 149
122 108 → 174 95
122 126 → 150 143
124 177 → 211 202
125 125 → 63 61
126 154 → 212 148
126 162 → 215 141
126 191 → 217 189
128 152 → 218 134
129 130 → 52 86
129 182 → 216 207
130 163 → 104 178
131 113 → 79 50
131 172 → 106 110
131 173 → 131 180
131 188 → 222 195
132 115 → 167 146
132 129 → 113 191
134 131 → 165 169
134 147 → 121 197
134 178 → 131 182
134 186 → 219 220
136 133 → 62 82
137 121 → 129 57
137 150 → 86 102
137 173 → 117 118
139 143 → 225 115
140 135 → 140 71
141 146 → 107 213
141 167 → 127 178

142 136 → 194 196
142 173 → 124 123
143 133 → 98 109
144 148 → 111 164
145 126 → 229 94
147 137 → 174 190
147 141 → 163 87
150 144 → 110 169
150 165 → 176 185
150 170 → 235 197
152 130 → 165 175
153 140 → 226 95
153 146 → 230 98
157 145 → 211 132
158 135 → 153 148
159 134 → 222 107
159 148 → 145 88
159 164 → 249 160
161 142 → 137 140
161 169 → 117 199
164 140 → 122 85
165 145 → 100 193
166 139 → 100 174
167 141 → 215 126
169 147 → 107 189
171 172 → 252 158
174 195 → 104 210
175 187 → 127 191
177 175 → 139 149
178 146 → 181 203
179 181 → 260 145
179 196 → 120 162
179 198 → 211 223
180 184 → 264 221
182 190 → 176 209
183 170 → 152 168
184 151 → 180 194
188 190 → 132 132
189 176 → 216 246
190 148 → 237 76
190 171 → 110 164
191 146 → 237 70
191 176 → 100 180
193 186 → 271 227
194 176 → 142 176
195 188 → 217 260
195 190 → 124 156
196 158 → 127 129
198 186 → 229 264
199 142 → 130 152
200 171 → 172 199
201 181 → 136 130
202 192 → 119 175
204 179 → 279 138
209 130 → 186 154
209 194 → 119 176
209 199 → 276 139
209 206 → 274 235
210 181 → 141 173
214 213 → 286 246
214 239 → 300 243
215 118 → 186 191
216 181 → 167 151
216 201 → 264 145
217 117 → 224 123
217 248 → 307 247
219 110 → 258 27
219 122 → 178 170
219 212 → 294 257
219 219 → 291 257
219 248 → 278 237
220 191 → 288 137
220 233 → 297 244
222 102 → 266 29
222 186 → 300 139
222 253 → 254 200
223 113 → 234 77
225 93 → 257 16
226 251 → 205 205
227 245 → 317 243
227 256 → 248 182
228 85 → 248 36
228 88 → 273 8
228 189 → 299 144
228 229 → 276 254
228 245 → 312 252
229 94 → 255 36
231 70 → 249 29
231 250 → 268 254
232 78 → 177 108

233 85 → 245 13
233 174 → 302 121
233 239 → 322 247
234 247 → 283 241
234 255 → 255 196
236 70 → 245 36
236 189 → 296 125
238 78 → 324 61
238 83 → 284 6
238 170 → 230 89
238 240 → 191 189
239 169 → 283 89
239 241 → 265 252
240 79 → 276 36
240 237 → 328 235
241 88 → 267 55
242 162 → 281 88
244 239 → 328 242
245 73 → 304 3
245 97 → 247 8
245 176 → 217 124
246 69 → 176 94
247 160 → 310 101
247 223 → 180 191
247 239 → 338 232
248 158 → 310 102
248 221 → 243 180
249 232 → 340 228
250 79 → 341 79
251 71 → 295 3
251 228 → 188 172
252 183 → 205 213
252 187 → 301 119
253 155 → 190 180
254 223 → 342 217
256 70 → 346 53
256 121 → 328 65
256 186 → 288 107
256 224 → 340 222
257 153 → 272 68
258 199 → 218 232
259 127 → 242 56
259 129 → 294 45
260 82 → 243 55
260 237 → 349 217
261 138 → 312 102
261 195 → 290 108
262 232 → 209 184
263 83 → 254 18
263 141 → 236 76
263 147 → 272 71
263 203 → 214 197
263 205 → 295 126
264 151 → 326 90
264 210 → 219 254
266 150 → 321 94
266 240 → 223 240
267 69 → 316 0
270 215 → 301 132
271 244 → 225 229
272 86 → 353 47
272 221 → 224 259
273 219 → 242 226
273 226 → 348 205
275 147 → 333 85
275 228 → 238 254
276 248 → 348 210
278 70 → 329 0
278 224 → 235 267
280 90 → 244 21
281 146 → 344 84
281 236 → 228 238
282 250 → 249 192
284 232 → 231 249
287 73 → 342 3
288 93 → 266 30
289 241 → 241 267
291 253 → 258 238
295 98 → 239 56
295 245 → 239 265
296 75 → 352 4
299 128 → 218 113
301 254 → 232 253
303 102 → 342 72
304 125 → 306 50
305 78 → 265 12
308 122 → 343 64
308 246 → 230 253
311 109 → 361 41
312 255 → 245 249

313 81 → 365 6
315 120 → 264 53
317 246 → 253 189
318 245 → 244 201
318 253 → 243 263
320 120 → 357 45
321 84 → 242 49
322 122 → 312 54
323 118 → 288 41
325 252 → 248 242
329 242 → 250 243
330 87 → 379 10
331 249 → 251 236
332 121 → 339 73
337 247 → 258 203
339 90 → 389 13
339 234 → 251 245
342 117 → 382 35
345 243 → 263 245
348 94 → 403 21
348 230 → 262 213
352 113 → 373 38
352 238 → 265 249
357 97 → 416 30
358 110 → 277 78
358 225 → 270 248
358 231 → 268 223
364 101 → 410 23
366 108 → 405 31
372 106 → 396 18