

Name: Sarwan Heer



Engineering Project U2

Actions.java

```
1. /*************************************************************************/
2.
3. * File name:
4.
5. * Actions.java
6.
7. *
8.
9. * Description:
10.
11. * This file contains methods that define actions to be performed when buttons are clicked.
12.
13. *
14.
15. * Author:
16.
17. * Sarwan Heer
18.
19. *
20.
21. * Date: April 7, 2024
22.
23. *
24.
25. * Concepts:
26.
27. * Swing event handling
28.
29. * File I/O
30.
31. * Calculation algorithms
32.
33. *****/
34. import javax.swing.*;
35. import java.awt.event.ActionEvent;
36. import java.awt.event.ActionListener;
37. import java.io.File;
38. import java.io.FileNotFoundException;
39. import java.util.ArrayList;
40. import java.util.Random;
41. import java.util.Scanner;
42. import java.text.DecimalFormat;
43.
44. public class Actions {
45. *****/
46.
47. * Method name:
48.
49. * findButtonClicked
50.
51. *
52.
53. * Description:
54.
55. * Handles the action when the 'Find' button is clicked. Retrieves the
56.
57. * city names from the text fields and searches for their coordinates
58.
59. * in the database.
60.
61. *
62.
63. * Parameters:
64.
65. * None
66.
67. *
68.
69. * Restrictions:
```

```
70.
71. * None
72.
73. *
74.
75. * Return:
76.
77. * void
78.
79. *
80.
81. * Restrictions:
82.
83. * None
84.
85. *****/
86.
87. public static void findButtonClicked() {
88.     String city1 = GUI.getCity1TextField().getText();
89.     String city2 = GUI.getCity2TextField().getText();
90.     searchCityInDatabase(city1, GUI.getCity1LngTextField(), GUI.getCity1LatTextField());
91.     searchCityInDatabase(city2, GUI.getCity2LngTextField(), GUI.getCity2LatTextField());
92. } /*End of findButtonClicked Method*/
93.
94. *****
95.
96. * Method name:
97.
98. * randomButtonClicked
99.
100. *
101.
102. * Description:
103.
104. * Handles the action when the 'Random' button is clicked. Retrieves
105.
106. * a List of cities from the database and sets two random cities'
107.
108. * names into the corresponding text fields.
109.
110. *
111.
112. * Parameters:
113.
114. * None
115.
116. *
117.
118. * Restrictions:
119.
120. * None
121.
122. *
123.
124. * Return:
125.
126. * void
127.
128. *
129.
130. * Restrictions:
131.
132. * None
133.
134. *****/
135.
136. public static void randomButtonClicked() {
137.     ArrayList<String> cities = getCitiesFromDatabase();
138.     Random random = new Random();
139.     String randomCity1 = cities.get(random.nextInt(cities.size()));
140.     String randomCity2 = cities.get(random.nextInt(cities.size()));
141.     GUI.getCity1TextField().setText(randomCity1);
142.     GUI.getCity2TextField().setText(randomCity2);
143. } /*End of randomButtonClicked Method*/
144.
145. *****
146.
147. * Method name:
148.
149. * getcitiesFromDatabase
150.
151. *
152.
153. * Description:
154.
155. * Retrieves a List of cities from the database file.
156.
157. *
```

```
158.  
159. * Parameters:  
160.  
161. * None  
162.  
163. *  
164.  
165. * Restrictions:  
166.  
167. * None  
168.  
169. *  
170.  
171. * Return:  
172.  
173. * ArrayList<String> - List of city names  
174.  
175. *  
176.  
177. * Restrictions:  
178.  
179. * None  
180.  
181. ****  
182.  
183. public static ArrayList<String> getCitiesFromDatabase() {  
184.     ArrayList<String> cities = new ArrayList<>();  
185.     try {  
186.         File file = new File("DB/locations.txt");  
187.         Scanner scanner = new Scanner(file);  
188.         scanner.nextLine(); // Skip header line  
189.     ****  
190.  
191.     * Loop:  
192.  
193.     * while (scanner.hasNextLine())  
194.  
195.     *  
196.  
197.     * Description:  
198.  
199.     * This Loop iterates through each line of the database file to extract cities.  
200.  
201. *  
202.  
203.     * Restrictions:  
204.  
205.     * None  
206.  
207.     *  
208.  
209. ****  
210.     while (scanner.hasNextLine()) {  
211.         String line = scanner.nextLine();  
212.         String[] parts = line.split(",");  
213.         String city = parts[1];  
214.         cities.add(city);  
215.     }  
216.     scanner.close();  
217. } catch (FileNotFoundException e) {  
218.     e.printStackTrace();  
219. }  
220. return cities;  
221. } /*End of getCitiesFromDatabase Method*/  
222.  
223. ****  
224.  
225. * Method name:  
226.  
227. * searchCityInDatabase  
228.  
229. *  
230.  
231. * Description:  
232.  
233. * Searches for a city in the database and retrieves its Longitude and Latitude.  
234.  
235. *  
236.  
237. * Parameters:  
238.  
239. * String cityName - The name of the city to search for.  
240.  
241. * JTextField LngTextField - The text field to display the Longitude.  
242.  
243. * JTextField LatTextField - The text field to display the Latitude.  
244.  
245. *
```

```
246.
247. * Restrictions:
248.
249. * None
250.
251. *
252.
253. * Return:
254.
255. * void
256.
257. *
258.
259. * Restrictions:
260.
261. * None
262.
263. ****
264.
265. public static void searchCityInDatabase(String cityName, JTextField lngTextField, JTextField latTextField) {
266.     boolean cityFound = false;
267.     try {
268.         File file = new File("DB/locations.txt");
269.         Scanner scanner = new Scanner(file);
270.         scanner.nextLine(); // Skip header line
271.     ****
272.
273.     * Loop:
274.
275.     * while (scanner.hasNextLine())
276.
277.     *
278.
279.     * Description:
280.
281.     * This Loop iterates through each line of the database file to search for a specific city.
282.
283.     * If the city is found, it updates the longitude and latitude text fields accordingly.
284.
285.     * If the city is not found, it displays an error message and clears the text fields.
286.
287.     *
288.
289.     * Restrictions:
290.
291.     * None
292.
293.     *
294.
295. ****
296.     while (scanner.hasNextLine()) {
297.         String line = scanner.nextLine();
298.         String[] parts = line.split(",");
299.         String city = parts[1];
300.         if (city.equals(cityName)) {
301.             lngTextField.setText(parts[3]); // Longitude
302.             latTextField.setText(parts[2]); // Latitude
303.             cityFound = true;
304.             break;
305.         }
306.     }
307.     scanner.close();
308. } catch (FileNotFoundException e) {
309.     e.printStackTrace();
310. }
311. if (!cityFound) {
312.     String message = "City '" + cityName + "' not found in the database.\nPlease enter a different city or check the spelling.";
313.     JOptionPane.showMessageDialog(null, message, "City Not Found", JOptionPane.INFORMATION_MESSAGE);
314.     lngTextField.setText("");
315.     latTextField.setText("");
316. }
317. } /*End of searchCityInDatabase Method*/
318.
319. ****
320.
321. * Method name:
322.
323. * calculateButtonClicked
324.
325. *
326.
327. * Description:
328.
329. * Calculates the distance between two cities based on their latitude and longitude.
330.
331. *
332.
```

```
333. * Parameters:
334.
335. * None
336.
337. *
338.
339. * Restrictions:
340.
341. * None
342.
343. *
344.
345. * Return:
346.
347. * void
348.
349. *
350.
351. * Restrictions:
352.
353. * None
354.
355. *****/
356.
357. public static void calculateButtonClicked() {
358.     String city1 = GUI.getCity1TextField().getText();
359.     String city2 = GUI.getCity2TextField().getText();
360.
361.     double lat1 = 0, lon1 = 0, lat2 = 0, lon2 = 0;
362.     String country1 = "", country2 = "";
363.
364.     try {
365.         File file = new File("DB/locations.txt");
366.         Scanner scanner = new Scanner(file);
367.         scanner.nextLine(); // Skip header line
368.     *****/
369.
370.     * Loop:
371.
372.     * while (scanner.hasNextLine())
373.
374.     *
375.
376.     * Description:
377.
378.     * This Loop iterates through each line of the database file to find the latitude
379.
380.     * and longitude of the first city provided as input. If the city is found, it
381.
382.     * retrieves its latitude, longitude, and country. Then, it breaks out of the loop.
383.
384.     *
385.
386.     * Restrictions:
387.
388.     * None
389.
390.     *
391.
392.     *****/
393.
394.     while (scanner.hasNextLine()) {
395.         String line = scanner.nextLine();
396.         String[] parts = line.split(",");
397.         String cityName = parts[1];
398.         if (cityName.equals(city1)) {
399.             lat1 = Double.parseDouble(parts[2]);
400.             lon1 = Double.parseDouble(parts[3]);
401.             country1 = parts[4];
402.             break;
403.         }
404.     }
405.
406.     scanner.close();
407.     scanner = new Scanner(file);
408.     scanner.nextLine(); // Skip header line
409. */
410.
411.     * Loop:
412.
413.     * while (scanner.hasNextLine())
414.
415.     *
416.
417.     * Description:
418.
419.     * This Loop iterates through each line of the database file to find the latitude
420.
```

```
421. * and longitude of the second city provided as input. If the city is found, it
422.
423. * retrieves its latitude, longitude, and country. Then, it breaks out of the loop.
424.
425. *
426.
427. * Restrictions:
428.
429. * None
430.
431. *
432.
433. ****
434.
435.     while (scanner.hasNextLine()) {
436.         String line = scanner.nextLine();
437.         String[] parts = line.split(",");
438.         String cityName = parts[1];
439.         if (cityName.equals(city2)) {
440.             lat2 = Double.parseDouble(parts[2]);
441.             lon2 = Double.parseDouble(parts[3]);
442.             country2 = parts[4];
443.             break;
444.         }
445.     }
446.
447.     scanner.close();
448.
449.     double distance = calculateDistance(lat1, lon1, lat2, lon2);
450.     int digits = Integer.parseInt(JOptionPane.showInputDialog(null, "Enter number of decimal digits for the answer:"));
451.     String formattedDistance = formatDistance(distance, digits);
452.
453.     String message = "Distance d = " + formattedDistance + " kilometers\n\n"
454.                 + "City1: " + city1 + "\n"
455.                 + "Country: " + country1 + "\n"
456.                 + "Lat: " + lat1 + "\n"
457.                 + "Lon: " + lon1 + "\n\n"
458.                 + "City2: " + city2 + "\n"
459.                 + "Country: " + country2 + "\n"
460.                 + "Lat: " + lat2 + "\n"
461.                 + "Lon: " + lon2;
462.     JOptionPane.showMessageDialog(null, message, "Distance Calculation Result", JOptionPane.INFORMATION_MESSAGE);
463.
464. } catch (FileNotFoundException ex) {
465.     ex.printStackTrace();
466. }
467. } /*End of calculateButtonClicked Method*/
468. ****
469.
470. * Method name:
471.
472. * calculateDistance
473.
474. *
475.
476. * Description:
477.
478. * This method calculates the distance between two geographical points
479.
480. * on the Earth's surface using their latitude and longitude coordinates.
481.
482. *
483.
484. * Parameters:
485.
486. * double - Latitude of the first point
487.
488. * double - Longitude of the first point
489.
490. * double - Latitude of the second point
491.
492. * double - Longitude of the second point
493.
494. *
495.
496. * Restrictions:
497.
498. * None
499.
500. *
501.
502. * Return:
503.
504. * a double representing the distance between the two points in kilometers
505.
506. *
507.
508. * Restrictions:
```

```
509.  
510. * None  
511.  
512. *  
513.  
514. ****/  
515. private static double calculateDistance(double lat1, double lon1, double lat2, double lon2) {  
516.     double R = 6371; // Radius of the Earth in kilometers  
517.     double lat1Rad = Math.toRadians(lat1);  
518.     double lon1Rad = Math.toRadians(lon1);  
519.     double lat2Rad = Math.toRadians(lat2);  
520.     double lon2Rad = Math.toRadians(lon2);  
521.     double dLat = lat2Rad - lat1Rad;  
522.     double dLon = lon2Rad - lon1Rad;  
523.     double a = Math.sin(dLat / 2) * Math.sin(dLat / 2) +  
524.             Math.cos(lat1Rad) * Math.cos(lat2Rad) *  
525.             Math.sin(dLon / 2) * Math.sin(dLon / 2);  
526.     double c = 2 * Math.atan2(Math.sqrt(a), Math.sqrt(1 - a));  
527.     return R * c;  
528. } /*End of calculateDistance Method*/  
529.  
530. ****  
531.  
532. * Method name:  
533.  
534. * formatDistance  
535.  
536. *  
537.  
538. * Description:  
539.  
540. * This method formats the distance value to a specified number of decimal digits.  
541.  
542. *  
543.  
544. * Parameters:  
545.  
546. * double - distance value to be formatted  
547.  
548. * int - number of decimal digits  
549.  
550. *  
551.  
552. * Restrictions:  
553.  
554. * None  
555.  
556. *  
557.  
558. * Return:  
559.  
560. * a string representing the formatted distance value  
561.  
562. *  
563.  
564. * Restrictions:  
565.  
566. * None  
567.  
568. *  
569.  
570. ****/  
571. private static String formatDistance(double distance, int digits) {  
572.     StringBuilder pattern = new StringBuilder("#.");  
573.     for (int i = 0; i < digits; i++) {  
574.         pattern.append("0");  
575.     }  
576.     DecimalFormat df = new DecimalFormat(pattern.toString());  
577.     return df.format(distance);  
578. } /*End of formatDistance Method*/  
579.  
580. ****  
581.  
582. * Method name:  
583.  
584. * clearButtonClicked  
585.  
586. *  
587.  
588. * Description:  
589.  
590. * Clears the text fields for both cities and their corresponding Longitude and Latitude.  
591.  
592. *  
593.  
594. * Parameters:  
595.  
596. * None
```

```

597.
598. *
599.
600. * Restrictions:
601.
602. * None
603.
604. *
605.
606. * Return:
607.
608. * void
609.
610. *
611.
612. * Restrictions:
613.
614. * None
615.
616. *****/
617.
618. public static void clearButtonClicked() {
619.     GUI.getCity1TextField().setText("");
620.     GUI.getCity2TextField().setText("");
621.     GUI.getCity1LngTextField().setText("");
622.     GUI.getCity1LatTextField().setText("");
623.     GUI.getCity2LngTextField().setText("");
624.     GUI.getCity2LatTextField().setText("");
625. } /*End of clearButtonClicked Method*/
626.
627. *****/
628.
629. * Method name:
630.
631. * exitButtonClicked
632.
633. *
634.
635. * Description:
636.
637. * Exits the application.
638.
639. *
640.
641. * Parameters:
642.
643. * None
644.
645. *
646.
647. * Restrictions:
648.
649. * None
650.
651. *
652.
653. * Return:
654.
655. * void
656.
657. *
658.
659. * Restrictions:
660.
661. * None
662.
663. *****/
664.
665. public static void exitButtonClicked() {
666.     System.exit(0);
667. } /*End of exitButtonClicked Method*/
668. } /* End of Actions class */

```

DB/

1.

DB/locations.txt

1. id,city,lat,lng,country
2. @1,Kabul,34.5253,69.1783,Afghanistan
3. @2,Tirana,41.3289,19.8178,Albania
4. @3,Durres,41.3133,19.4458,Albania
5. @4,Vlore,40.4667,19.4833,Albania

6. @5, **Algiers**, 36.7539, 3.0589, **Algeria**
7. @6, **Constantine**, 36.35, 6.6, **Algeria**
8. @7, **Tchitado**, -17.3167, 13.9167, **Angola**
9. @8, **Cazombo**, -11.9058, 22.9217, **Angola**
10. @9, **The Valley**, 18.2208, -63.0517, **Anguilla**
11. @10, **Saint John's**, 17.1167, -61.85, **Antigua and Barbuda**
12. @11, **Buenos Aires**, -34.6033, -58.3817, **Argentina**
13. @12, **Cordoba**, -31.4167, -64.1833, **Argentina**
14. @13, **Yerevan**, 40.1814, 44.5144, **Armenia**
15. @14, **Gyumri**, 40.7894, 43.8475, **Armenia**
16. @15, **Oranjestad**, 12.5186, -70.0358, **Aruba**
17. @16, **Tanki Leendert**, 12.5418, -70.022, **Aruba**
18. @17, **Melbourne**, -37.8142, 144.9631, **Australia**
19. @18, **Sydney**, -33.8678, 151.21, **Australia**
20. @19, **Brisbane**, -27.4678, 153.0281, **Australia**
21. @20, **Vienna**, 48.2083, 16.3725, **Austria**
22. @21, **Graz**, 47.0708, 15.4386, **Austria**
23. @22, **Baku**, 40.3953, 49.8822, **Azerbaijan**
24. @23, **Sumqayit**, 40.5897, 49.6686, **Azerbaijan**
25. @24, **Nassau**, 25.0781, -77.3386, "Bahamas, The"
26. @25, **Lucaya**, 26.5117, -78.6431, "Bahamas, The"
27. @26, **Manama**, 26.225, 50.5775, **Bahrain**
28. @27, **Al Muharraq**, 26.25, 50.6167, **Bahrain**
29. @28, **Dhaka**, 23.7639, 90.3889, **Bangladesh**
30. @29, **Chattogram**, 22.335, 91.8325, **Bangladesh**
31. @30, **Bridgetown**, 13.0975, -59.6167, **Barbados**
32. @31, **Minsk**, 53.9, 27.5667, **Belarus**
33. @32, **Homyel**, 52.4453, 30.9842, **Belarus**
34. @33, **Brussels**, 50.8467, 4.3525, **Belgium**
35. @34, **Antwerp**, 51.2178, 4.4003, **Belgium**
36. @35, **Belize City**, 17.4986, -88.1886, **Belize**
37. @36, **San Ignacio**, 17.1588, -89.0696, **Belize**
38. @37, **Cotonou**, 6.3667, 2.4333, **Benin**
39. @38, **Abomey-Calavi**, 6.4486, 2.3556, **Benin**
40. @39, **Hamilton**, 32.293, -64.782, **Bermuda**
41. @40, **Thimphu**, 27.4722, 89.6361, **Bhutan**
42. @41, **Phuntsholing**, 26.85, 89.3833, **Bhutan**
43. @42, **Santa Cruz de la Sierra**, -17.7892, -63.1975, **Bolivia**
44. @43, **La Paz**, -16.4958, -68.1333, **Bolivia**
45. @44, **Sarajevo**, 43.8564, 18.4131, **Bosnia and Herzegovina**
46. @45, **Banja Luka**, 44.7725, 17.1925, **Bosnia and Herzegovina**
47. @46, **Gaborone**, -24.6581, 25.9122, **Botswana**
48. @47, **Francistown**, -21.1736, 27.5125, **Botswana**
49. @48, **Sao Paulo**, -23.55, -46.6333, **Brazil**
50. @49, **Rio de Janeiro**, -22.9111, -43.2056, **Brazil**
51. @50, **Bandar Seri Begawan**, 4.8903, 114.9422, **Brunei**
52. @51, **Seria**, 4.6141, 114.3302, **Brunei**
53. @52, **Sofia**, 42.7, 23.33, **Bulgaria**
54. @53, **Varna**, 43.2167, 27.9167, **Bulgaria**
55. @54, **Ouagadougou**, 12.3686, -1.5275, **Burkina Faso**
56. @55, **Bobo-Dioulasso**, 11.1833, -4.2833, **Burkina Faso**
57. @56, **Rangoon**, 16.795, 96.16, **Burma**
58. @57, **Mandalay**, 21.9831, 96.0844, **Burma**
59. @58, **Bujumbura**, -3.3833, 29.3667, **Burundi**
60. @59, **Gitega**, -3.4283, 29.925, **Burundi**
61. @60, **Mindelo**, 16.886, -24.988, **Cabo Verde**
62. @61, **Praia**, 14.918, -23.509, **Cabo Verde**
63. @62, **Phnom Penh**, 11.5694, 104.9211, **Cambodia**
64. @63, **Siem Reap**, 13.3622, 103.8597, **Cambodia**
65. @64, **Douala**, 4.05, 9.7, **Cameroon**
66. @65, **Yaounde**, 3.8667, 11.5167, **Cameroon**
67. @66, **Toronto**, 43.7417, -79.3733, **Canada**
68. @67, **Montreal**, 45.5089, -73.5617, **Canada**
69. @68, **Vancouver**, 49.25, -123.1, **Canada**
70. @69, **Calgary**, 51.05, -114.0667, **Canada**
71. @70, **Edmonton**, 53.5344, -113.4903, **Canada**
72. @71, **Ottawa**, 45.4247, -75.695, **Canada**
73. @72, **Winnipeg**, 49.8844, -97.1464, **Canada**
74. @73, **Quebec City**, 46.8139, -71.2081, **Canada**
75. @74, **Hamilton**, 43.2567, -79.8692, **Canada**
76. @75, **Mississauga**, 43.6, -79.65, **Canada**
77. @76, **Brampton**, 43.6833, -79.7667, **Canada**
78. @77, **Surrey**, 49.19, -122.8489, **Canada**
79. @78, **Kitchener**, 43.4186, -80.4728, **Canada**
80. @79, **Halifax**, 44.6475, -63.5906, **Canada**
81. @80, **Laval**, 45.5833, -73.75, **Canada**
82. @81, **London**, 42.9836, -81.2497, **Canada**
83. @82, **Victoria**, 48.4283, -123.3647, **Canada**
84. @83, **Markham**, 43.8767, -79.2633, **Canada**
85. @84, **Oshawa**, 43.9, -78.85, **Canada**
86. @85, **Vaughan**, 43.8333, -79.5, **Canada**
87. @86, **Windsor**, 42.2833, -83, **Canada**
88. @87, **Gatineau**, 45.4833, -75.65, **Canada**
89. @88, **Saskatoon**, 52.1333, -106.6833, **Canada**
90. @89, **Longueuil**, 45.5333, -73.5167, **Canada**
91. @90, **Burnaby**, 49.2667, -122.9667, **Canada**
92. @91, **St. Catharines**, 43.1833, -79.2333, **Canada**
93. @92, **Regina**, 50.4547, -104.6067, **Canada**

94. @93, **Oakville**, 43.45, -79.6833, Canada
95. @94, **Richmond**, 49.1667, -123.1333, Canada
96. @95, **Richmond Hill**, 43.8667, -79.4333, Canada
97. @96, **Burlington**, 43.3167, -79.8, Canada
98. @97, **St. John's**, 47.4817, -52.7971, Canada
99. @98, **Kelowna**, 49.8881, -119.4956, Canada
100. @99, **Sherbrooke**, 45.4, -71.9, Canada
101. @100, **Sudbury**, 46.49, -81.03, Canada
102. @101, **Barrie**, 44.3711, -79.6769, Canada
103. @102, **Abbotsford**, 49.05, -122.3167, Canada
104. @103, **Levis**, 46.8, -71.1833, Canada
105. @104, **Coquitlam**, 49.2839, -122.7919, Canada
106. @105, **Saguenay**, 48.4167, -71.0667, Canada
107. @106, **Guelph**, 43.55, -80.25, Canada
108. @107, **Trois-Rivières**, 46.35, -72.55, Canada
109. @108, **Whitby**, 43.8833, -78.9417, Canada
110. @109, **Cambridge**, 43.3972, -80.3114, Canada
111. @110, **Kanata**, 45.3333, -75.9, Canada
112. @111, **Milton**, 43.5083, -79.8833, Canada
113. @112, **Kingston**, 44.3128, -76.4553, Canada
114. @113, **Ajax**, 43.8583, -79.0364, Canada
115. @114, **Waterloo**, 43.4667, -80.5167, Canada
116. @115, **Terrebonne**, 45.7, -73.6333, Canada
117. @116, **Moncton**, 46.1328, -64.7714, Canada
118. @117, **Saanich**, 48.484, -123.381, Canada
119. @118, **White Rock**, 49.025, -122.8028, Canada
120. @119, **Thunder Bay**, 48.3822, -89.2461, Canada
121. @120, **Delta**, 49.0847, -123.0586, Canada
122. @121, **Nanaimo**, 49.1642, -123.9364, Canada
123. @122, **Brantford**, 43.1667, -80.25, Canada
124. @123, **Chatham**, 42.4229, -82.1324, Canada
125. @124, **Chicoutimi**, 48.4333, -71.0667, Canada
126. @125, **Clarington**, 43.935, -78.6083, Canada
127. @126, **Saint-Jerome**, 45.7833, -74, Canada
128. @127, **Red Deer**, 52.2681, -113.8111, Canada
129. @128, **Pickering**, 43.8354, -79.089, Canada
130. @129, **Lethbridge**, 49.6942, -112.8328, Canada
131. @130, **Kamloops**, 50.6761, -120.3408, Canada
132. @131, **Saint-Jean-sur-Richelieu**, 45.3167, -73.2667, Canada
133. @132, **Niagara Falls**, 43.06, -79.1067, Canada
134. @133, **Cape Breton**, 46.1389, -60.1931, Canada
135. @134, **Chilliwack**, 49.1577, -121.9509, Canada
136. @135, **Brossard**, 45.4667, -73.45, Canada
137. @136, **Maple Ridge**, 49.2167, -122.6, Canada
138. @137, **Newmarket**, 44.05, -79.4667, Canada
139. @138, **Repentigny**, 45.7333, -73.4667, Canada
140. @139, **Peterborough**, 44.3, -78.3167, Canada
141. @140, **Drummondville**, 45.8833, -72.4833, Canada
142. @141, **Kawartha Lakes**, 44.35, -78.75, Canada
143. @142, **New Westminster**, 49.2069, -122.9111, Canada
144. @143, **Prince George**, 53.9169, -122.7494, Canada
145. @144, **Caledon**, 43.8667, -79.8667, Canada
146. @145, **Chateauguay**, 45.38, -73.75, Canada
147. @146, **Belleville**, 44.1667, -77.3833, Canada
148. @147, **Airdrie**, 51.2917, -114.0144, Canada
149. @148, **Sarnia**, 42.9994, -82.3889, Canada
150. @149, **Wood Buffalo**, 57.6042, -111.3284, Canada
151. @150, **Sault Ste. Marie**, 46.5333, -84.35, Canada
152. @151, **Saint John**, 45.2806, -66.0761, Canada
153. @152, **Welland**, 42.9833, -79.2333, Canada
154. @153, **Granby**, 45.4, -72.7333, Canada
155. @154, **St. Albert**, 53.6303, -113.6258, Canada
156. @155, **Fort McMurray**, 56.7333, -111.3833, Canada
157. @156, **Fredericton**, 45.9636, -66.6431, Canada
158. @157, **Grande Prairie**, 55.1708, -118.7947, Canada
159. @158, **Medicine Hat**, 50.0417, -110.6775, Canada
160. @159, **Halton Hills**, 43.63, -79.95, Canada
161. @160, **Aurora**, 44, -79.4667, Canada
162. @161, **Port Coquitlam**, 49.2625, -122.7811, Canada
163. @162, **Mirabel**, 45.65, -74.0833, Canada
164. @163, **Blainville**, 45.67, -73.88, Canada
165. @164, **Lac-Brome**, 45.2167, -72.5167, Canada
166. @165, **North Vancouver**, 49.3202, -123.0699, Canada
167. @166, **Saint-Hyacinthe**, 45.6167, -72.95, Canada
168. @167, **Bowmanville**, 43.9125, -78.6871, Canada
169. @168, **Beloëil**, 45.5667, -73.2, Canada
170. @169, **North Bay**, 46.3, -79.45, Canada
171. @170, **Charlottetown**, 46.2403, -63.1347, Canada
172. @171, **Vernon**, 50.267, -119.272, Canada
173. @172, **Brandon**, 49.8483, -99.95, Canada
174. @173, **Mascouche**, 45.75, -73.6, Canada
175. @174, **Stouffville**, 43.9667, -79.25, Canada
176. @175, **Shawinigan**, 46.5667, -72.75, Canada
177. @176, **Joliette**, 46.0167, -73.45, Canada
178. @177, **Rimouski**, 48.45, -68.53, Canada
179. @178, **Courtenay**, 49.6878, -124.9944, Canada
180. @179, **Dollard-des-Ormeaux**, 45.4833, -73.8167, Canada
181. @180, **Cornwall**, 45.0275, -74.74, Canada

182. @181, **Victoriaville**, 46.05, -71.9667, Canada
183. @182, **Georgina**, 44.3, -79.4333, Canada
184. @183, **Woodstock**, 43.1306, -80.7467, Canada
185. @184, **Langford Station**, 48.4506, -123.5058, Canada
186. @185, **Quinte West**, 44.1833, -77.5667, Canada
187. @186, **St. Thomas**, 42.775, -81.1833, Canada
188. @187, **Saint-Eustache**, 45.57, -73.9, Canada
189. @188, **West Vancouver**, 49.3667, -123.1667, Canada
190. @189, **Georgetown**, 43.6526, -79.9281, Canada
191. @190, **New Tecumseth**, 44.0833, -79.75, Canada
192. @191, **Innisfil**, 44.3, -79.5833, Canada
193. @192, **Vaudreuil-Dorion**, 45.4, -74.0333, Canada
194. @193, **Bradford West Gwillimbury**, 44.1333, -79.6333, Canada
195. @194, **Salaberry-de-Valleyfield**, 45.25, -74.13, Canada
196. @195, **Rouyn-Noranda**, 48.2333, -79.0167, Canada
197. @196, **Boucherville**, 45.6, -73.45, Canada
198. @197, **Mission**, 49.1337, -122.3112, Canada
199. @198, **Timmins**, 48.4667, -81.3333, Canada
200. @199, **Lakeshore**, 42.2399, -82.6511, Canada
201. @200, **Brant**, 43.1167, -80.3667, Canada
202. @201, **Spruce Grove**, 53.545, -113.9008, Canada
203. @202, **Bradford**, 44.1167, -79.5667, Canada
204. @203, **Campbell River**, 50.0244, -125.2475, Canada
205. @204, **Prince Albert**, 53.2, -105.75, Canada
206. @205, **Penticton**, 49.4911, -119.5886, Canada
207. @206, **Sorel-Tracy**, 46.0333, -73.1167, Canada
208. @207, **East Kelowna**, 49.8625, -119.5833, Canada
209. @208, **Leamington**, 42.0667, -82.5833, Canada
210. @209, **East Gwillimbury**, 44.1333, -79.4167, Canada
211. @210, **Cote-Saint-Luc**, 45.4687, -73.6673, Canada
212. @211, **Orangeville**, 43.9167, -80.1167, Canada
213. @212, **Leduc**, 53.2594, -113.5492, Canada
214. @213, **Moose Jaw**, 50.3933, -105.5519, Canada
215. @214, **Port Moody**, 49.2831, -122.8317, Canada
216. @215, **Pointe-Claire**, 45.45, -73.8167, Canada
217. @216, **Orillia**, 44.6, -79.4167, Canada
218. @217, **Stratford**, 43.3708, -80.9819, Canada
219. @218, **Saint-Georges**, 46.0966, -70.6768, Canada
220. @219, **Fort Erie**, 42.9167, -79.0167, Canada
221. @220, **Val-d'Or**, 48.1, -77.7833, Canada
222. @221, **LaSalle**, 42.2167, -83.0667, Canada
223. @222, **Cochrane**, 51.189, -114.467, Canada
224. @223, **North Cowichan**, 48.8236, -123.7192, Canada
225. @224, **Lloydminster**, 53.2783, -110.005, Canada
226. @225, **Chambly**, 45.4311, -73.2873, Canada
227. @226, **Centre Wellington**, 43.7, -80.3667, Canada
228. @227, **Okotoks**, 50.725, -113.975, Canada
229. @228, **Alma**, 48.55, -71.65, Canada
230. @229, **Sainte-Julie**, 45.5833, -73.3333, Canada
231. @230, **Saint-Constant**, 45.37, -73.57, Canada
232. @231, **Langley**, 49.0987, -122.6597, Canada
233. @232, **Grimsby**, 43.2, -79.55, Canada
234. @233, **Magog**, 45.2667, -72.15, Canada
235. @234, **Boisbriand**, 45.62, -73.83, Canada
236. @235, **Whitehorse**, 60.7029, -135.0691, Canada
237. @236, **Dieppe**, 46.0989, -64.7242, Canada
238. @237, **King**, 44.0463, -79.6044, Canada
239. @238, **Parksville**, 49.315, -124.312, Canada
240. @239, **Conception Bay South**, 47.5167, -52.9833, Canada
241. @240, **Keswick**, 44.25, -79.4667, Canada
242. @241, **Fort Saskatchewan**, 53.7128, -113.2133, Canada
243. @242, **Woolwich**, 43.5667, -80.4833, Canada
244. @243, **Bolton**, 43.8833, -79.7333, Canada
245. @244, **Sainte-Therese**, 45.6333, -73.85, Canada
246. @245, **Clarence-Rockland**, 45.4833, -75.2, Canada
247. @246, **La Prairie**, 45.42, -73.5, Canada
248. @247, **Saint-Bruno-de-Montarville**, 45.5333, -73.35, Canada
249. @248, **Midland**, 44.75, -79.8833, Canada
250. @249, **Thetford Mines**, 46.1, -71.3, Canada
251. @250, **Lincoln**, 43.13, -79.43, Canada
252. @251, **Quispamsis**, 45.4322, -65.9462, Canada
253. @252, **Wasaga Beach**, 44.5206, -80.0167, Canada
254. @253, **Collingwood**, 44.5, -80.2167, Canada
255. @254, **Sept-Iles**, 50.2167, -66.3833, Canada
256. @255, **Duncan**, 48.7787, -123.7079, Canada
257. @256, **Hudson**, 45.45, -74.15, Canada
258. @257, **Saint-Lin-Laurentides**, 45.85, -73.7667, Canada
259. @258, **Tsawwassen**, 49.0436, -123.0985, Canada
260. @259, **Strathroy-Caradoc**, 42.9575, -81.6167, Canada
261. @260, **Squamish**, 49.7017, -123.1589, Canada
262. @261, **Thorold**, 43.1167, -79.2, Canada
263. @262, **Truro**, 45.3647, -63.28, Canada
264. @263, **Amherstburg**, 42.1, -83.0833, Canada
265. @264, **L'Assomption**, 45.8333, -73.4167, Canada
266. @265, **Tecumseh**, 42.2431, -82.9256, Canada
267. @266, **Alliston**, 44.15, -79.8667, Canada
268. @267, **Fergus**, 43.707, -80.3777, Canada
269. @268, **Ladner**, 49.0833, -123.0833, Canada

270. @269, **Candiac**, 45.38, -73.52, Canada
271. @270, **Essa**, 44.25, -79.7833, Canada
272. @271, **Paradise**, 47.5333, -52.8667, Canada
273. @272, **Saint-Lambert**, 45.5, -73.5167, Canada
274. @273, **Mount Pearl Park**, 47.5189, -52.8058, Canada
275. @274, **Lindsay**, 44.35, -78.7333, Canada
276. @275, **Saint-Lazare**, 45.4, -74.1333, Canada
277. @276, **Owen Sound**, 44.5667, -80.9333, Canada
278. @277, **Brockville**, 44.5833, -75.6833, Canada
279. @278, **Chestermere**, 51.05, -113.8225, Canada
280. @279, **Kingsville**, 42.1, -82.7167, Canada
281. @280, **Port Alberni**, 49.2339, -124.805, Canada
282. @281, **Springwater**, 44.4333, -79.7333, Canada
283. @282, **Scugog**, 44.09, -78.936, Canada
284. @283, **Uxbridge**, 44.1167, -79.1333, Canada
285. @284, **Fort St. John**, 56.2465, -120.8476, Canada
286. @285, **Wilmot**, 43.4, -80.65, Canada
287. @286, **Essex**, 42.0833, -82.9, Canada
288. @287, **Varennes**, 45.6833, -73.4333, Canada
289. @288, **Oro-Medonte**, 44.5667, -79.5833, Canada
290. @289, **Mont-Royal**, 45.5161, -73.6431, Canada
291. @290, **Beaumont**, 53.3572, -113.4147, Canada
292. @291, **Baie-Comeau**, 49.2167, -68.15, Canada
293. @292, **Riverview**, 46.0613, -64.8052, Canada
294. @293, **Cobourg**, 43.9667, -78.1667, Canada
295. @294, **Cranbrook**, 49.5097, -115.7667, Canada
296. @295, **Yellowknife**, 62.4709, -114.4053, Canada
297. @296, **South Frontenac**, 44.5081, -76.4939, Canada
298. @297, **Riviere-du-Loup**, 47.8333, -69.5333, Canada
299. @298, **Port Colborne**, 42.8833, -79.25, Canada
300. @299, **Saint-Augustin-de-Desmaures**, 46.7333, -71.4667, Canada
301. @300, **Huntsville**, 45.3333, -79.2167, Canada
302. @301, **Sainte-Marthe-sur-le-Lac**, 45.53, -73.93, Canada
303. @302, **Lloydminster**, 53.2807, -110.035, Canada
304. @303, **Westmount**, 45.4833, -73.6, Canada
305. @304, **Russell**, 45.2569, -75.3583, Canada
306. @305, **Les Coteaux**, 45.28, -74.23, Canada
307. @306, **Salmon Arm**, 50.7022, -119.2722, Canada
308. @307, **Kirkland**, 45.45, -73.8667, Canada
309. @308, **Corner Brook**, 48.9287, -57.926, Canada
310. @309, **New Glasgow**, 45.5926, -62.6455, Canada
311. @310, **Dorval**, 45.45, -73.75, Canada
312. @311, **Beaconsfield**, 45.4333, -73.8667, Canada
313. @312, **Pitt Meadows**, 49.2333, -122.6833, Canada
314. @313, **Niagara-on-the-Lake**, 43.2553, -79.0717, Canada
315. @314, **Colwood**, 48.4236, -123.4958, Canada
316. @315, **Middlesex Centre**, 43.05, -81.45, Canada
317. @316, **Mont-Saint-Hilaire**, 45.5622, -73.1917, Canada
318. @317, **Camrose**, 53.0167, -112.8333, Canada
319. @318, **Selwyn**, 44.4167, -78.3333, Canada
320. @319, **Tillsonburg**, 42.8667, -80.7333, Canada
321. @320, **Pelham**, 43.0333, -79.3333, Canada
322. @321, **Petawawa**, 45.9, -77.2833, Canada
323. @322, **Stony Plain**, 53.5264, -114.0069, Canada
324. @323, **Oak Bay**, 48.4264, -123.3228, Canada
325. @324, **North Grenville**, 44.9667, -75.65, Canada
326. @325, **Loyalist**, 44.25, -76.75, Canada
327. @326, **Deux-Montagnes**, 45.5333, -73.8833, Canada
328. @327, **Steinbach**, 49.5258, -96.6839, Canada
329. @328, **Saint-Colomban**, 45.73, -74.13, Canada
330. @329, **Miramichi**, 47.0196, -65.5072, Canada
331. @330, **Esquimalt**, 48.4306, -123.4147, Canada
332. @331, **Buckingham**, 45.5889, -75.4164, Canada
333. @332, **Central Saanich**, 48.5142, -123.3839, Canada
334. @333, **Sainte-Catherine**, 45.4, -73.58, Canada
335. @334, **Port Hope**, 43.95, -78.3, Canada
336. @335, **Inverness**, 46.2, -61.1, Canada
337. @336, **Saint-Basile-le-Grand**, 45.5333, -73.2833, Canada
338. @337, **L'Ancienne-Lorette**, 46.8, -71.35, Canada
339. @338, **Glace Bay**, 46.2, -59.9667, Canada
340. @339, **Swift Current**, 50.2881, -107.7939, Canada
341. @340, **Pembroke**, 45.8167, -77.1, Canada
342. @341, **Edmundston**, 47.3765, -68.3253, Canada
343. @342, **Yorkton**, 51.2139, -102.4628, Canada
344. @343, **Springfield**, 49.9292, -96.6939, Canada
345. @344, **Sylvan Lake**, 52.3083, -114.0964, Canada
346. @345, **Simcoe**, 42.8376, -80.3073, Canada
347. @346, **Strathroy**, 42.9558, -81.6226, Canada
348. @347, **Bracebridge**, 45.0333, -79.3, Canada
349. @348, **Summerside**, 46.4, -63.7833, Canada
350. @349, **Canmore**, 51.089, -115.359, Canada
351. @350, **Bathurst**, 47.62, -65.65, Canada
352. @351, **Greater Napanee**, 44.25, -76.95, Canada
353. @352, **Lake Country**, 50.0833, -119.4142, Canada
354. @353, **Laurentides**, 45.85, -73.7667, Canada
355. @354, **Hanover**, 49.4433, -96.8492, Canada
356. @355, **Winkler**, 49.1817, -97.9397, Canada
357. @356, **Saint-Charles-Borromée**, 46.05, -73.4667, Canada

358. @357, **Cowansville**, 45.2, -72.75, Canada
359. @358, **Sainte-Anne-des-Plaines**, 45.7617, -73.8204, Canada
360. @359, **Gaspe**, 48.8333, -64.4833, Canada
361. @360, **Sooke**, 48.3761, -123.7378, Canada
362. @361, **Kenora**, 49.7667, -94.4833, Canada
363. @362, **Cold Lake**, 54.4642, -110.1825, Canada
364. @363, **Paris**, 43.2, -80.3833, Canada
365. @364, **Brooks**, 50.5642, -111.8989, Canada
366. @365, **Kentville**, 45.0775, -64.4958, Canada
367. @366, **Comox**, 49.6733, -124.9022, Canada
368. @367, **Pincourt**, 45.3833, -73.9833, Canada
369. @368, **Mississippi Mills**, 45.2167, -76.2, Canada
370. @369, **St. Clair**, 42.7833, -82.35, Canada
371. @370, **Terrace**, 54.5164, -128.5997, Canada
372. @371, **Mercier**, 45.32, -73.75, Canada
373. @372, **Angus**, 44.3167, -79.8833, Canada
374. @373, **West Lincoln**, 43.0667, -79.5667, Canada
375. @374, **Lavaltrie**, 45.8833, -73.2833, Canada
376. @375, **New Hamburg**, 43.3808, -80.7062, Canada
377. @376, **West Nipissing / Nipissing Ouest**, 46.3667, -79.9167, Canada
378. @377, **Strathmore**, 51.0378, -113.4003, Canada
379. @378, **High River**, 50.5808, -113.8744, Canada
380. @379, **Clearview**, 44.3981, -80.0742, Canada
381. @380, **Lachute**, 45.65, -74.3333, Canada
382. @381, **Rosemere**, 45.6369, -73.8, Canada
383. @382, **Matane**, 48.85, -67.5333, Canada
384. @383, **Thames Centre**, 43.03, -81.08, Canada
385. @384, **Powell River**, 49.8353, -124.5247, Canada
386. @385, **Carleton Place**, 45.1333, -76.1333, Canada
387. @386, **Guelph/Eramosa**, 43.63, -80.22, Canada
388. @387, **Grand Falls**, 48.9578, -55.6633, Canada
389. @388, **North Battleford**, 52.7575, -108.2861, Canada
390. @389, **Mont-Laurier**, 46.55, -75.5, Canada
391. @390, **Central Elgin**, 42.7667, -81.1, Canada
392. @391, **Mistassini**, 48.8229, -72.2154, Canada
393. @392, **Saugeen Shores**, 44.4333, -81.3667, Canada
394. @393, **Ingersoll**, 43.0392, -80.8836, Canada
395. @394, **Beauharnois**, 45.32, -73.87, Canada
396. @395, **Rockland**, 45.5459, -75.2836, Canada
397. @396, **South Stormont**, 45.0833, -74.9667, Canada
398. @397, **Becancour**, 46.3333, -72.4333, Canada
399. @398, **Severn**, 44.75, -79.5167, Canada
400. @399, **Lacombe**, 52.4683, -113.7369, Canada
401. @400, **Sainte-Sophie**, 45.82, -73.9, Canada
402. @401, **Port-Alfred**, 48.3333, -70.8833, Canada
403. @402, **Val-des-Monts**, 45.65, -75.6667, Canada
404. @403, **Beamsville**, 43.171, -79.4767, Canada
405. @404, **Saint-Amable**, 45.65, -73.3, Canada
406. @405, **Portage La Prairie**, 49.9728, -98.2919, Canada
407. @406, **South Glengarry**, 45.2, -74.5833, Canada
408. @407, **Sainte-Marie**, 46.45, -71.0333, Canada
409. @408, **North Perth**, 43.73, -80.95, Canada
410. @409, **Thompson**, 55.7433, -97.8553, Canada
411. @410, **Trent Hills**, 44.3142, -77.8514, Canada
412. @411, **Trail**, 49.095, -117.71, Canada
413. @412, **The Nation / La Nation**, 45.35, -75.0333, Canada
414. @413, **Amos**, 48.5667, -78.1167, Canada
415. @414, **Wetaskiwin**, 52.9694, -113.3769, Canada
416. @415, **West Grey**, 44.1833, -80.8167, Canada
417. @416, **Warman**, 52.3219, -106.5842, Canada
418. @417, **Sydney Mines**, 46.2333, -60.2167, Canada
419. @418, **Dawson Creek**, 55.7606, -120.2356, Canada
420. @419, **Sidney**, 48.6506, -123.3986, Canada
421. @420, **Gravenhurst**, 44.9167, -79.3667, Canada
422. @421, **Prince Rupert**, 54.3122, -130.3271, Canada
423. @422, **Perth East**, 43.47, -80.95, Canada
424. @423, **North Saanich**, 48.6142, -123.42, Canada
425. @424, **Caledonia**, 43.0773, -79.9514, Canada
426. @425, **Prevost**, 45.87, -74.08, Canada
427. @426, **Sainte-Adele**, 45.95, -74.13, Canada
428. @427, **Sainte-Agathe-des-Monts**, 46.05, -74.28, Canada
429. @428, **Quesnel**, 52.9784, -122.4927, Canada
430. @429, **Les Iles-de-la-Madeleine**, 47.3833, -61.8667, Canada
431. @430, **Tache**, 49.7081, -96.6736, Canada
432. @431, **Wellington North**, 43.9, -80.57, Canada
433. @432, **St. Andrews**, 50.27, -96.9747, Canada
434. @433, **Williams Lake**, 52.1294, -122.1383, Canada
435. @434, **Gander**, 48.9569, -54.6089, Canada
436. @435, **Whistler**, 50.1208, -122.9544, Canada
437. @436, **Brighton**, 44.1222, -77.7642, Canada
438. @437, **Tiny**, 44.6833, -79.95, Canada
439. @438, **Hawkesbury**, 45.6, -74.6, Canada
440. @439, **Carignan**, 45.45, -73.3, Canada
441. @440, **Brock**, 44.3167, -79.0833, Canada
442. @441, **L'ile-Perron**, 45.3833, -73.95, Canada
443. @442, **Summerland**, 49.6006, -119.6778, Canada
444. @443, **Chatham**, 47.0443, -65.3781, Canada
445. @444, **St. Clements**, 50.2689, -96.6742, Canada

446. @445, **View Royal**, 48.4517, -123.4339, Canada
447. @446, **Montmagny**, 46.9833, -70.55, Canada
448. @447, **Cantley**, 45.5667, -75.7833, Canada
449. @448, **Erin**, 43.7667, -80.0667, Canada
450. @449, **Notre-Dame-de-l'Île-Perrot**, 45.3667, -73.9333, Canada
451. @450, **Kincardine**, 44.1667, -81.6333, Canada
452. @451, **Elliot Lake**, 46.3833, -82.65, Canada
453. @452, **Bromont**, 45.3167, -72.65, Canada
454. @453, **Arnprior**, 45.4333, -76.35, Canada
455. @454, **North Dundas**, 45.0833, -75.35, Canada
456. @455, **Wellesley**, 43.55, -80.7167, Canada
457. @456, **Nelson**, 49.5, -117.2833, Canada
458. @457, **Ladysmith**, 48.9975, -123.8203, Canada
459. @458, **Coldstream**, 50.22, -119.2481, Canada
460. @459, **Hauterive**, 49.1833, -68.2667, Canada
461. @460, **Georgian Bluffs**, 44.65, -81.0333, Canada
462. @461, **Weyburn**, 49.6611, -103.8525, Canada
463. @462, **La Tuque**, 48.0652, -74.0528, Canada
464. @463, **Norwich**, 42.9833, -80.6, Canada
465. @464, **Meaford**, 44.58, -80.73, Canada
466. @465, **Adjala-Tosoronto**, 44.1333, -79.9333, Canada
467. @466, **Hamilton Township**, 44.054, -78.2164, Canada
468. @467, **Stratford**, 46.2167, -63.0893, Canada
469. @468, **Estevan**, 49.1392, -102.9861, Canada
470. @469, **Dolbeau**, 48.8666, -72.2333, Canada
471. @470, **South Dundas**, 44.9167, -75.2667, Canada
472. @471, **Binbrook**, 43.122, -79.805, Canada
473. @472, **Elmira**, 43.5996, -80.5604, Canada
474. @473, **Lambton Shores**, 43.1833, -81.9, Canada
475. @474, **North Dumfries**, 43.32, -80.38, Canada
476. @475, **Martensville**, 52.2897, -106.6667, Canada
477. @476, **Mapleton**, 43.7358, -80.6681, Canada
478. @477, **Rawdon**, 46.05, -73.7167, Canada
479. @478, **Morinville**, 53.8022, -113.6497, Canada
480. @479, **Wallaceburg**, 42.5984, -82.3916, Canada
481. @480, **Blackfalds**, 52.3833, -113.8, Canada
482. @481, **Chester**, 44.65, -64.3, Canada
483. @482, **Queens**, 44.0333, -64.7167, Canada
484. @483, **Selkirk**, 50.1436, -96.8839, Canada
485. @484, **Saint-Félicien**, 48.65, -72.45, Canada
486. @485, **Roberval**, 48.52, -72.23, Canada
487. @486, **Rideau Lakes**, 44.6667, -76.2167, Canada
488. @487, **Sechelt**, 49.4742, -123.7542, Canada
489. @488, **Bois-des-Filion**, 45.6667, -73.75, Canada
490. @489, **North Glengarry**, 45.3333, -74.7333, Canada
491. @490, **South Huron**, 43.32, -81.5, Canada
492. @491, **Marieville**, 45.4333, -73.1667, Canada
493. @492, **Penetanguishene**, 44.7667, -79.9333, Canada
494. @493, **Tay**, 44.7167, -79.7667, Canada
495. @494, **Castlegar**, 49.3256, -117.6661, Canada
496. @495, **Cavan Monaghan**, 44.2, -78.4667, Canada
497. @496, **Morden**, 49.1919, -98.1006, Canada
498. @497, **Temiskaming Shores**, 47.5167, -79.6833, Canada
499. @498, **Hinton**, 53.4114, -117.5639, Canada
500. @499, **Saint-Sauveur**, 45.9, -74.17, Canada
501. @500, **Grey Highlands**, 44.3333, -80.5, Canada
502. @501, **East St. Paul**, 49.9772, -97.0103, Canada
503. @502, **Stoneham-et-Tewkesbury**, 47.1667, -71.4333, Canada
504. @503, **Alfred and Plantagenet**, 45.5667, -74.9167, Canada
505. @504, **Mont-Tremblant**, 46.1167, -74.6, Canada
506. @505, **Port Elgin**, 44.4333, -81.3833, Canada
507. @506, **Saint-Zotique**, 45.25, -74.25, Canada
508. @507, **Saint-Raymond**, 46.9, -71.8333, Canada
509. @508, **Tottenham**, 44.0238, -79.8045, Canada
510. @509, **Gibsons**, 49.4028, -123.5036, Canada
511. @510, **Port Perry**, 44.1, -78.9333, Canada
512. @511, **Amherst**, 45.8167, -64.2167, Canada
513. @512, **Elizabethtown-Kitley**, 44.7, -75.8833, Canada
514. @513, **Listowel**, 43.7351, -80.9533, Canada
515. @514, **Crystal Beach**, 42.8661, -79.0624, Canada
516. @515, **Smiths Falls**, 44.9, -76.0167, Canada
517. @516, **Lorraine**, 45.6833, -73.7833, Canada
518. @517, **Ramara**, 44.6333, -79.2167, Canada
519. @518, **Notre-Dame-des-Prairies**, 46.05, -73.4333, Canada
520. @519, **Leeds and the Thousand Islands**, 44.45, -76.08, Canada
521. @520, **Brockton**, 44.1667, -81.2167, Canada
522. @521, **Laurentian Valley**, 45.7681, -77.2239, Canada
523. @522, **Mono**, 44.0167, -80.0667, Canada
524. @523, **Acton**, 43.6333, -80.0333, Canada
525. @524, **Sainte-Julienne**, 45.97, -73.72, Canada
526. @525, **Qualicum Beach**, 49.35, -124.4333, Canada
527. @526, **Malahide**, 42.7928, -80.9361, Canada
528. @527, **Oromocto**, 45.8488, -66.4788, Canada
529. @528, **Whitecourt**, 54.1417, -115.6833, Canada
530. @529, **Olds**, 51.7928, -114.1067, Canada
531. @530, **Huron East**, 43.63, -81.28, Canada
532. @531, **Beckwith**, 45.0833, -76.0667, Canada
533. @532, **Labrador City**, 52.95, -66.9167, Canada

534. @533, **Shelburne**, 44.0833, -80.2, **Canada**
535. @534, **Stanley**, 49.1331, -98.0656, **Canada**
536. @535, **Taber**, 49.7847, -112.1508, **Canada**
537. @536, **Donnacona**, 46.6747, -71.7294, **Canada**
538. @537, **Corman Park No.** 344, 52.2291, -106.8002, **Canada**
539. @538, **L'Epiphanie**, 45.8483, -73.5061, **Canada**
540. @539, **West Perth**, 43.47, -81.2, **Canada**
541. @540, **Campbellton**, 48.005, -66.6731, **Canada**
542. @541, **Bridgewater**, 44.37, -64.52, **Canada**
543. @542, **Coaldale**, 49.7333, -112.6167, **Canada**
544. @543, **Pont-Rouge**, 46.75, -71.7, **Canada**
545. @544, **Champlain**, 45.5333, -74.65, **Canada**
546. @545, **Coaticook**, 45.1333, -71.8, **Canada**
547. @546, **Embrun**, 45.2735, -75.292, **Canada**
548. @547, **Minto**, 43.9167, -80.8667, **Canada**
549. @548, **La Peché**, 45.6833, -75.9833, **Canada**
550. @549, **Shediac**, 46.2167, -64.5333, **Canada**
551. @550, **Iqaluit**, 63.7598, -68.5107, **Canada**
552. @551, **George Town**, 19.2866, -81.3744, **Cayman Islands**
553. @552, **Bangui**, 4.3733, 18.5628, **Central African Republic**
554. @553, **Bimo**, 4.3137, 18.3065, **Central African Republic**
555. @554, **N'Djamena**, 12.11, 15.05, **Chad**
556. @555, **Moundou**, 8.5667, 16.0833, **Chad**
557. @556, **Santiago**, -33.4372, -70.6506, **Chile**
558. @557, **Concepcion**, -36.8282, -73.0514, **Chile**
559. @558, **Guangzhou**, 23.13, 113.26, **China**
560. @559, **Shanghai**, 31.2286, 121.4747, **China**
561. @560, **Beijing**, 39.9067, 116.3975, **China**
562. @561, **Shenzhen**, 22.5415, 114.0596, **China**
563. @562, **Bogota**, 4.7111, -74.0722, **Colombia**
564. @563, **Medellin**, 6.2308, -75.5906, **Colombia**
565. @564, **Brazzaville**, -4.2694, 15.2711, **Congo (Brazzaville)**
566. @565, **Pointe-Noire**, -4.7975, 11.8503, **Congo (Brazzaville)**
567. @566, **Mbujي-Mayi**, -6.15, 23.6, **Congo (Kinshasa)**
568. @567, **Kananga**, -5.897, 22.4488, **Congo (Kinshasa)**
569. @568, **Avarua**, -21.207, -159.771, **Cook Islands**
570. @569, **San Jose**, 9.9325, -84.08, **Costa Rica**
571. @570, **San Marcos**, 10.6204, -84.512, **Costa Rica**
572. @571, **Zagreb**, 45.8131, 15.9775, **Croatia**
573. @572, **Split**, 43.51, 16.44, **Croatia**
574. @573, **Havana**, 23.1367, -82.3589, **Cuba**
575. @574, **Santiago de Cuba**, 20.0217, -75.8294, **Cuba**
576. @575, **Nicosia**, 35.1725, 33.365, **Cyprus**
577. @576, **Limassol**, 34.6747, 33.0442, **Cyprus**
578. @577, **Prague**, 50.0875, 14.4214, **Czechia**
579. @578, **Brno**, 49.1925, 16.6083, **Czechia**
580. @579, **Copenhagen**, 55.6761, 12.5683, **Denmark**
581. @580, **Aarhus**, 56.1572, 10.2107, **Denmark**
582. @581, **Djibouti**, 11.5883, 43.145, **Djibouti**
583. @582, **Arta**, 11.5236, 42.8472, **Djibouti**
584. @583, **Roseau**, 15.3014, -61.3883, **Dominica**
585. @584, **Santiago**, 19.4572, -70.6889, **Dominican Republic**
586. @585, **Santo Domingo**, 18.4667, -69.95, **Dominican Republic**
587. @586, **Guayaquil**, -2.19, -79.8875, **Ecuador**
588. @587, **Quito**, -0.22, -78.5125, **Ecuador**
589. @588, **Cairo**, 30.0444, 31.2358, **Egypt**
590. @589, **Giza**, 29.987, 31.2118, **Egypt**
591. @590, **Alexandria**, 31.1975, 29.8925, **Egypt**
592. @591, **San Salvador**, 13.6989, -89.1914, **El Salvador**
593. @592, **Santa Ana**, 13.995, -89.5561, **El Salvador**
594. @593, **Malabo**, 3.7456, 8.7744, **Equatorial Guinea**
595. @594, **Bata**, 1.865, 9.77, **Equatorial Guinea**
596. @595, **Asmara**, 15.3228, 38.925, **Eritrea**
597. @596, **Keren**, 15.7778, 38.4581, **Eritrea**
598. @597, **Tallinn**, 59.4372, 24.7453, **Estonia**
599. @598, **Tartu**, 58.3833, 26.7167, **Estonia**
600. @599, **Manzini**, -26.4833, 31.3667, **Eswatini**
601. @600, **Mbabane**, -26.3167, 31.1333, **Eswatini**
602. @601, **Addis Ababa**, 9.03, 38.74, **Ethiopia**
603. @602, **Eren Sata**, 9.5667, 41.3833, **Ethiopia**
604. @603, **Stanley**, -51.7, -57.85, **Falkland Islands (Islas Malvinas)**
605. @604, **Torshavn**, 62, -6.7833, **Faroe Islands**
606. @605, **Suva**, -18.1416, 178.4419, **Fiji**
607. @606, **Helsinki**, 60.1708, 24.9375, **Finland**
608. @607, **Tampere**, 61.4981, 23.76, **Finland**
609. @608, **Paris**, 48.8567, 2.3522, **France**
610. @609, **Bordeaux**, 44.84, -0.58, **France**
611. @610, **Cayenne**, 4.933, -52.33, **French Guiana**
612. @611, **Papeete**, -17.5334, -149.5667, **French Polynesia**
613. @612, **Libreville**, 0.3903, 9.4542, **Gabon**
614. @613, **Port-Gentil**, -0.7167, 8.7833, **Gabon**
615. @614, **Banjul**, 13.4531, -16.5775, "Gambia, The"
616. @615, **Serekunda**, 13.4333, -16.6667, "Gambia, The"
617. @616, **Gaza**, 31.5069, 34.456, **Gaza Strip**
618. @617, **Khan Yunis**, 31.3444, 34.3031, **Gaza Strip**
619. @618, **Tbilisi**, 41.7225, 44.7925, **Georgia**
620. @619, **Batumi**, 41.6458, 41.6417, **Georgia**
621. @620, **Berlin**, 52.52, 13.405, **Germany**

622. @621, **Stuttgart**, 48.7775, 9.18, **Germany**
623. @622, **Munich**, 48.1375, 11.575, **Germany**
624. @623, **Kumasi**, 6.7, -1.625, **Ghana**
625. @624, **Boankra**, 6.6944, -1.4028, **Ghana**
626. @625, **Gibraltar**, 36.14, -5.35, **Gibraltar**
627. @626, **Athens**, 37.9842, 23.7281, **Greece**
628. @627, **Thessaloniki**, 40.6403, 22.9347, **Greece**
629. @628, **Nuuk**, 64.1814, -51.6942, **Greenland**
630. @629, **Sisimiut**, 66.9389, -53.6722, **Greenland**
631. @630, **Nord**, 81.7166, -17.8, **Greenland**
632. @631, **Saint David's**, 12.0444, -61.6806, **Grenada**
633. @632, **Pointe-a-Pitre**, 16.2411, -61.5331, **Guadeloupe**
634. @633, **Maina**, 13.4692, 144.7332, **Guam**
635. @634, **Guatemala City**, 14.6133, -90.5353, **Guatemala**
636. @635, **Mixco**, 14.6331, -90.6064, **Guatemala**
637. @636, **Saint Peter Port**, 49.4555, -2.5368, **Guernsey**
638. @637, **Conakry**, 9.5092, -13.7122, **Guinea**
639. @638, **Mamou**, 10.3833, -12.0833, **Guinea**
640. @639, **Bissau**, 11.85, -15.5667, **Guinea-Bissau**
641. @640, **Farim**, 12.4833, -15.2167, **Guinea-Bissau**
642. @641, **Georgetown**, 6.8058, -58.1508, **Guyana**
643. @642, **Linden**, 6, -58.3, **Guyana**
644. @643, **Port-au-Prince**, 18.5333, -72.3333, **Haiti**
645. @644, **Carrefour**, 18.5344, -72.4094, **Haiti**
646. @645, **Tegucigalpa**, 14.1058, -87.2047, **Honduras**
647. @646, **Comayaguela**, 14.098, -87.21, **Honduras**
648. @647, **Hong Kong**, 22.3, 114.2, **Hong Kong**
649. @648, **Kowloon**, 22.3167, 114.1833, **Hong Kong**
650. @649, **Budapest**, 47.4925, 19.0514, **Hungary**
651. @650, **Debrecen**, 47.53, 21.6392, **Hungary**
652. @651, **Reykjavik**, 64.1467, -21.94, **Iceland**
653. @652, **Kopavogur**, 64.1108, -21.9094, **Iceland**
654. @653, **Delhi**, 28.61, 77.23, **India**
655. @654, **Mumbai**, 19.0761, 72.8775, **India**
656. @655, **Kolkata**, 22.5675, 88.37, **India**
657. @656, **Bangalore**, 12.9789, 77.5917, **India**
658. @657, **Chennai**, 13.0825, 80.275, **India**
659. @658, **Hyderabad**, 17.3617, 78.4747, **India**
660. @659, **Pune**, 18.5203, 73.8567, **India**
661. @660, **Jakarta**, -6.175, 106.8275, **Indonesia**
662. @661, **Surabaya**, -7.2458, 112.7378, **Indonesia**
663. @662, **Tehran**, 35.6892, 51.3889, **Iran**
664. @663, **Mashhad**, 36.3264, 59.5433, **Iran**
665. @664, **Baghdad**, 33.3153, 44.3661, **Iraq**
666. @665, **Mosul**, 36.34, 43.13, **Iraq**
667. @666, **Dublin**, 53.35, -6.2603, **Ireland**
668. @667, **Finglas**, 53.4597, -6.2181, **Ireland**
669. @668, **Douglas**, 54.15, -4.4775, **Isle of Man**
670. @669, **Tel Aviv-Yafo**, 32.08, 34.78, **Israel**
671. @670, **Jerusalem**, 31.7789, 35.2256, **Israel**
672. @671, **Rome**, 41.8933, 12.4828, **Italy**
673. @672, **Milan**, 45.4669, 9.19, **Italy**
674. @673, **Naples**, 40.8333, 14.25, **Italy**
675. @674, **Kingston**, 17.9714, -76.7931, **Jamaica**
676. @675, **Portmore**, 17.95, -76.8799, **Jamaica**
677. @676, **Tokyo**, 35.6897, 139.6922, **Japan**
678. @677, **Osaka**, 34.6939, 135.5022, **Japan**
679. @678, **Saint Helier**, 49.1858, -2.11, **Jersey**
680. @679, **Amman**, 31.9497, 35.9328, **Jordan**
681. @680, **Al Mafraq**, 32.3399, 36.2052, **Jordan**
682. @681, **Almaty**, 43.24, 76.915, **Kazakhstan**
683. @682, **Shymkent**, 42.3167, 69.5958, **Kazakhstan**
684. @683, **Nairobi**, -1.2864, 36.8172, **Kenya**
685. @684, **Mombasa**, -4.05, 39.6667, **Kenya**
686. @685, **Tarawa**, 1.3382, 173.0176, **Kiribati**
687. @686, **Pyongyang**, 39.0167, 125.7475, "Korea, North"
688. @687, **Hamhung**, 39.9167, 127.5333, "Korea, North"
689. @688, **Seoul**, 37.56, 126.99, "Korea, South"
690. @689, **Busan**, 35.18, 129.075, "Korea, South"
691. @690, **Prizren**, 42.2128, 20.7392, **Kosovo**
692. @691, **Pristina**, 42.6633, 21.1622, **Kosovo**
693. @692, **Kuwait City**, 29.3697, 47.9783, **Kuwait**
694. @693, **Al Jahra**, 29.35, 47.6833, **Kuwait**
695. @694, **Bishkek**, 42.8747, 74.6122, **Kyrgyzstan**
696. @695, **Osh**, 40.53, 72.8, **Kyrgyzstan**
697. @696, **Vientiane**, 17.98, 102.63, **Laos**
698. @697, **Xiangkhoang**, 19.4167, 103.5, **Laos**
699. @698, **Riga**, 56.9489, 24.1064, **Latvia**
700. @699, **Daugavpils**, 55.875, 26.5356, **Latvia**
701. @700, **Beirut**, 33.8983, 35.5057, **Lebanon**
702. @701, **Barri Elias**, 33.775, 35.9, **Lebanon**
703. @702, **Maseru**, -29.31, 27.48, **Lesotho**
704. @703, **Teyateyaneng**, -29.1511, 27.7425, **Lesotho**
705. @704, **Monrovia**, 6.3133, -10.8014, **Liberia**
706. @705, **New Kru Town**, 6.3733, -10.7928, **Liberia**
707. @706, **Tripoli**, 32.8872, 13.1914, **Libya**
708. @707, **Benghazi**, 32.1167, 20.0667, **Libya**
709. @708, **Schaan**, 47.1667, 9.5097, **Liechtenstein**

710. @709,[Vilnius](#),54.6872,25.28,Lithuania
711. @710,[Kaunas](#),54.8972,23.8861,Lithuania
712. @711,[Luxembourg](#),49.6117,6.1319,Luxembourg
713. @712,[Macau](#),22.2006,113.5461,Macau
714. @713,[Antananarivo](#),-18.91,47.525,Madagascar
715. @714,[Blantyre](#),-15.7861,35.0058,Malawi
716. @715,[Lilongwe](#),-13.9833,33.7833,Malawi
717. @716,[Kuala Lumpur](#),3.1478,101.6953,Malaysia
718. @717,[Seberang Jaya](#),5.4083,100.3695,Malaysia
719. @718,[Male](#),4.1753,73.5089,Maldives
720. @719,[Kulhudhuffushi](#),6.6225,73.0703,Maldives
721. @720,[Bamako](#),12.6392,-8.0028,Mali
722. @721,[Balandougou](#),13.3558,-9.5517,Mali
723. @722,[Valletta](#),35.8983,14.5125,Malta
724. @723,[Qormi](#),35.8794,14.4722,Malta
725. @724,[Majuro](#),7.0833,171.3833,Marshall Islands
726. @725,[Fort-de-France](#),14.6,-61.0667,Martinique
727. @726,[Nouakchott](#),18.0858,-15.9785,Mauritania
728. @727,[Arafat](#),18.0464,-15.9719,Mauritania
729. @728,[Port Louis](#),-20.1644,57.5042,Mauritius
730. @729,[Curepipe](#),-20.3188,57.5263,Mauritius
731. @730,[Mamoudzou](#),-12.7806,45.2278,Mayotte
732. @731,[Mexico City](#),19.4333,-99.1333,Mexico
733. @732,[Guadalajara](#),20.6767,-103.3475,Mexico
734. @733,[Weno](#),7.4417,151.8583,"Micronesia, Federated States of"
735. @734,[Chisinau](#),47.0228,28.8353,Moldova
736. @735,[Tiraspol](#),46.8403,29.6433,Moldova
737. @736,[Monaco](#),43.7333,7.4167,Monaco
738. @737,[Ulaanbaatar](#),47.9203,106.9172,Mongolia
739. @738,[Moron](#),49.6356,100.1556,Mongolia
740. @739,[Podgorica](#),42.4414,19.2628,Montenegro
741. @740,[Niksic](#),42.7778,18.95,Montenegro
742. @741,[Brades](#),16.7928,-62.2106,Montserrat
743. @742,[Casablanca](#),33.5333,-7.5833,Morocco
744. @743,[Fes](#),34.0433,-5.0033,Morocco
745. @744,[Maputo](#),-25.9667,32.5833,Mozambique
746. @745,[Matola](#),-25.9667,32.4667,Mozambique
747. @746,[Windhoek](#),-22.57,17.0836,Namibia
748. @747,[Walvisbaai](#),-22.9561,14.5081,Namibia
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752. @751,[Tilburg](#),51.55,5.0833,Netherlands
753. @752,[Amsterdam](#),52.3728,4.8936,Netherlands
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756. @755,[Christchurch](#),-43.531,172.6365,New Zealand
757. @756,[Managua](#),12.1364,-86.2514,Nicaragua
758. @757,[Leon](#),12.4333,-86.8867,Nicaragua
759. @758,[Niamey](#),13.515,2.1175,Niger
760. @759,[Maradi](#),13.4833,7.1,Niger
761. @760,[Lagos](#),6.455,3.3841,Nigeria
762. @761,[Abuja](#),9.0667,7.4833,Nigeria
763. @762,[Alofi](#),-19.056,-169.921,Niue
764. @763,[Kingston](#),-29.0606,167.9619,Norfolk Island
765. @764,[Skopje](#),41.9961,21.4317,North Macedonia
766. @765,[Kumanovo](#),42.1322,21.7144,North Macedonia
767. @766,[Capitol Hill](#),15.2137,145.7546,Northern Mariana Islands
768. @767,[Oslo](#),59.9133,10.7389,Norway
769. @768,[Bergen](#),60.3894,5.33,Norway
770. @769,[Masqat](#),23.5889,58.4083,Oman
771. @770,[Muscat](#),23.6139,58.5922,Oman
772. @771,[Karachi](#),24.86,67.01,Pakistan
773. @772,[Lahore](#),31.5497,74.3436,Pakistan
774. @773,[Koror](#),7.3419,134.4792,Palau
775. @774,[Panama City](#),8.9833,-79.5167,Panama
776. @775,[San Miguelito](#),9.033,-79.5,Panama
777. @776,[Port Moresby](#),-9.4789,147.1494,Papua New Guinea
778. @777,[Lae](#),-6.7303,147.0008,Papua New Guinea
779. @778,[Asuncion](#),-25.3,-57.6333,Paraguay
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782. @781,[Arequipa](#),-16.4,-71.5333,Peru
783. @782,[Manila](#),14.5958,120.9772,Philippines
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795. @794,[Bucharest](#),44.4325,26.1039,Romania
796. @795,[Cluj-Napoca](#),46.7667,23.5833,Romania
797. @796,[Moscow](#),55.7558,37.6172,Russia

798. @797, **Saint Petersburg**, 59.9375, 30.3086, **Russia**
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 802. @801, **Jamestown**, -15.9251, -5.7179, "Saint Helena, Ascension, and Tristan da Cunha"
 803. @802, **Basseterre**, 17.3, -62.7333, **Saint Kitts and Nevis**
 804. @803, **Castries**, 14.0167, -60.9833, **Saint Lucia**
 805. @804, **Marigot**, 18.0706, -63.0847, **Saint Martin**
 806. @805, **Saint-Pierre**, 46.7778, -56.1778, **Saint Pierre and Miquelon**
 807. @806, **Calliaqua**, 13.1308, -61.1928, **Saint Vincent and the Grenadines**
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 812. @811, **Riyadh**, 24.6333, 46.7167, **Saudi Arabia**
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 814. @813, **Mecca**, 21.4225, 39.8233, **Saudi Arabia**
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 833. @832, **Juba**, 4.85, 31.6, **South Sudan**
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 855. @854, **Dushanbe**, 38.5367, 68.78, **Tajikistan**
 856. @855, **Khujand**, 40.2833, 69.6333, **Tajikistan**
 857. @856, **Ubungo**, -6.7889, 39.2056, **Tanzania**
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 863. @862, **Nuku'alofa**, -21.1333, -175.2, **Tonga**
 864. @863, **Chaguanas**, 10.5167, -61.4, **Trinidad and Tobago**
 865. @864, **Tunis**, 36.8064, 10.1817, **Tunisia**
 866. @865, **Sidi Bouzid**, 35.0381, 9.4858, **Tunisia**
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 875. @874, **Mbale**, 1.0806, 34.175, **Uganda**
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1384. @1383, **Slidell**, 30.2887, -89.7828, United States
1385. @1384, **Buckeye**, 33.4314, -112.6429, United States
1386. @1385, **Livonia**, 42.3972, -83.3733, United States
1387. @1386, **Williamsburg**, 37.2693, -76.7076, United States
1388. @1387, **Suffolk**, 36.6953, -76.6398, United States
1389. @1388, **Compton**, 33.893, -118.2274, United States
1390. @1389, **La Crosse**, 43.8241, -91.2268, United States
1391. @1390, **Edmond**, 35.6689, -97.416, United States
1392. @1391, **Carson**, 33.8374, -118.2559, United States
1393. @1392, **San Marcos**, 33.135, -117.1743, United States
1394. @1393, **Greenburgh**, 41.033, -73.8412, United States
1395. @1394, **Tracy**, 37.7269, -121.4523, United States
1396. @1395, **Prescott Valley**, 34.598, -112.3185, United States
1397. @1396, **Middletown**, 39.5033, -84.3659, United States
1398. @1397, **Fall River**, 41.7136, -71.1015, United States
1399. @1398, **Santa Fe**, 35.6619, -105.9819, United States
1400. @1399, **Plantation**, 26.1259, -80.2617, United States
1401. @1400, **New Braunfels**, 29.6994, -98.1148, United States
1402. @1401, **Roswell**, 34.0391, -84.3513, United States
1403. @1402, **Conroe**, 30.3238, -95.4824, United States
1404. @1403, **South Gate**, 33.9447, -118.1926, United States
1405. @1404, **Santa Monica**, 34.0235, -118.481, United States
1406. @1405, **Kirkland**, 47.697, -122.2057, United States
1407. @1406, **Hoover**, 33.3763, -86.8068, United States
1408. @1407, **O'Fallon**, 38.785, -90.7175, United States
1409. @1408, **Hamilton**, 40.2046, -74.6765, United States
1410. @1409, **Alafaya**, 28.528, -81.1868, United States
1411. @1410, **Palm Coast**, 29.5389, -81.2457, United States
1412. @1411, **Norwalk**, 41.1144, -73.4215, United States
1413. @1412, **Lawton**, 34.6175, -98.4202, United States

1414. @1413, Chino, 33.9836, -117.6654, United States
1415. @1414, Mount Pleasant, 32.8537, -79.8203, United States
1416. @1415, Manteca, 37.7927, -121.2264, United States
1417. @1416, Westminster, 33.7523, -117.9938, United States
1418. @1417, Florence, 34.178, -79.7898, United States
1419. @1418, Joplin, 37.0757, -94.5018, United States
1420. @1419, Germantown, 39.1755, -77.2643, United States
1421. @1420, San Leandro, 37.7074, -122.1599, United States
1422. @1421, Cheektowaga, 42.9082, -78.7466, United States
1423. @1422, 'n' Country, 28.0106, -82.5763, United States
1424. @1423, Clifton, 40.863, -74.1575, United States
1425. @1424, Waukegan, 42.3698, -87.8716, United States
1426. @1425, Bloomington, 44.8306, -93.3151, United States
1427. @1426, Avondale, 33.3873, -112.3235, United States
1428. @1427, Atascocita, 29.9777, -95.1953, United States
1429. @1428, Missoula, 46.8751, -114.0214, United States
1430. @1429, Fort Myers, 26.6194, -81.8302, United States
1431. @1430, Newton, 42.3316, -71.2085, United States
1432. @1431, Lawrence, 42.7002, -71.1626, United States
1433. @1432, Muncie, 40.1989, -85.395, United States
1434. @1433, Rapid City, 44.0716, -103.2204, United States
1435. @1434, Troy, 42.5817, -83.1457, United States
1436. @1435, Livermore, 37.6868, -121.7607, United States
1437. @1436, Citrus Heights, 38.6948, -121.288, United States
1438. @1437, Hawthorne, 33.9147, -118.3476, United States
1439. @1438, Winchester, 39.1735, -78.1746, United States
1440. @1439, Springdale, 36.1901, -94.1574, United States
1441. @1440, Clarkstown, 41.1319, -73.966, United States
1442. @1441, Whittier, 33.9678, -118.0188, United States
1443. @1442, Deerfield Beach, 26.305, -80.1277, United States
1444. @1443, Decatur, 39.8557, -88.9342, United States
1445. @1444, San Ramon, 37.7624, -121.9365, United States
1446. @1445, Vineland, 39.4653, -74.9981, United States
1447. @1446, Mission, 26.2039, -98.3256, United States
1448. @1447, Auburn, 47.3039, -122.2108, United States
1449. @1448, Lake Forest, 33.6605, -117.6714, United States
1450. @1449, Colonie, 42.7396, -73.7874, United States
1451. @1450, Upper Darby, 39.949, -75.2891, United States
1452. @1451, Newport Beach, 33.6151, -117.8668, United States
1453. @1452, Melbourne, 28.1086, -80.6627, United States
1454. @1453, Brooklyn Park, 45.1112, -93.3505, United States
1455. @1454, Bryan, 30.665, -96.3807, United States
1456. @1455, Westland, 42.3192, -83.3805, United States
1457. @1456, Napa, 38.2975, -122.301, United States
1458. @1457, Baytown, 29.7587, -94.9671, United States
1459. @1458, Cicero, 41.8445, -87.7593, United States
1460. @1459, Anderson, 40.0891, -85.6892, United States
1461. @1460, Franklin, 35.92, -86.8516, United States
1462. @1461, Farmington Hills, 42.486, -83.3771, United States
1463. @1462, Buena Park, 33.8572, -118.0046, United States
1464. @1463, Albany, 31.5776, -84.1762, United States
1465. @1464, Pine Hills, 28.5818, -81.4692, United States
1466. @1465, State College, 40.7909, -77.8567, United States
1467. @1466, Redwood City, 37.5025, -122.2253, United States
1468. @1467, Warwick, 41.7062, -71.4334, United States
1469. @1468, Jackson, 42.2431, -84.4038, United States
1470. @1469, Cranston, 41.7658, -71.4858, United States
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1472. @1471, Miami Beach, 25.8171, -80.1396, United States
1473. @1472, Alhambra, 34.084, -118.1355, United States
1474. @1473, Johns Creek, 34.0333, -84.2027, United States
1475. @1474, Mountain View, 37.4001, -122.0796, United States
1476. @1475, Salisbury, 38.3756, -75.5865, United States
1477. @1476, Morgantown, 39.6383, -79.9464, United States
1478. @1477, Silver Spring, 39.0028, -77.0207, United States
1479. @1478, Layton, 41.077, -111.962, United States
1480. @1479, Springfield, 39.93, -83.7959, United States
1481. @1480, Lakewood, 33.8471, -118.1222, United States
1482. @1481, Florence, 34.8303, -87.6655, United States
1483. @1482, Folsom, 38.6668, -121.1422, United States
1484. @1483, Madera, 36.963, -120.0778, United States
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1486. @1485, Parma, 41.3843, -81.7286, United States
1487. @1486, Terre Haute, 39.466, -87.3751, United States
1488. @1487, Somerville, 42.3908, -71.1014, United States
1489. @1488, Flagstaff, 35.1872, -111.6194, United States
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1491. @1490, Homestead, 25.4665, -80.4472, United States
1492. @1491, Newark, 40.0706, -82.425, United States
1493. @1492, Plymouth, 45.0225, -93.4617, United States
1494. @1493, Anniston, 33.6712, -85.8135, United States
1495. @1494, Texarkana, 33.45, -94.0847, United States
1496. @1495, Tustin, 33.7311, -117.8107, United States
1497. @1496, Pharr, 26.1685, -98.1904, United States
1498. @1497, Port Huron, 42.9821, -82.4388, United States
1499. @1498, Turlock, 37.5053, -120.8588, United States
1500. @1499, Rancho Cordova, 38.5737, -121.2527, United States
1501. @1500, The Villages, 28.9034, -81.9887, United States

1502. @1501, Milpitas, 37.4336, -121.8921, United States
1503. @1502, Perris, 33.7898, -117.2233, United States
1504. @1503, Upland, 34.1178, -117.6604, United States
1505. @1504, Alton, 38.9037, -90.152, United States
1506. @1505, Pleasanton, 37.6663, -121.8805, United States
1507. @1506, Kendall, 25.6697, -80.3556, United States
1508. @1507, Jonesboro, 35.8212, -90.6791, United States
1509. @1508, Bellflower, 33.888, -118.1271, United States
1510. @1509, Battle Creek, 42.2985, -85.2296, United States
1511. @1510, Chino Hills, 33.9508, -117.7254, United States
1512. @1511, Cheyenne, 41.135, -104.7902, United States
1513. @1512, Lebanon, 40.3412, -76.4228, United States
1514. @1513, Carmichael, 38.6318, -121.3263, United States
1515. @1514, South Jordan, 40.557, -111.9784, United States
1516. @1515, Davis, 38.5553, -121.737, United States
1517. @1516, Elizabethtown, 37.7031, -85.8773, United States
1518. @1517, Schaumburg, 42.0308, -88.0838, United States
1519. @1518, Alameda, 37.7668, -122.267, United States
1520. @1519, Hammond, 41.6168, -87.4909, United States
1521. @1520, Pasco, 46.2506, -119.1305, United States
1522. @1521, Evanston, 42.0464, -87.6943, United States
1523. @1522, Lehi, 40.4136, -111.8725, United States
1524. @1523, Alexandria, 31.2923, -92.4702, United States
1525. @1524, North Port, 27.0576, -82.1977, United States
1526. @1525, Arlington Heights, 42.0955, -87.9826, United States
1527. @1526, Camarillo, 34.223, -119.0321, United States
1528. @1527, Wyoming, 42.8908, -85.7066, United States
1529. @1528, Flower Mound, 33.0343, -97.1146, United States
1530. @1529, Bethlehem, 40.6266, -75.3679, United States
1531. @1530, Hattiesburg, 31.3074, -89.317, United States
1532. @1531, Loveland, 40.4166, -105.0623, United States
1533. @1532, Pittsburg, 38.0182, -121.8965, United States
1534. @1533, Cedar Park, 30.5105, -97.8197, United States
1535. @1534, Wenatchee, 47.436, -120.3295, United States
1536. @1535, Southfield, 42.4765, -83.2605, United States
1537. @1536, Rochester Hills, 42.6645, -83.1563, United States
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1543. @1542, Pawtucket, 41.8744, -71.3743, United States
1544. @1543, St. Joseph, 39.7598, -94.821, United States
1545. @1544, Cherry Hill, 39.9034, -74.9947, United States
1546. @1545, Doral, 25.8152, -80.3565, United States
1547. @1546, Dover, 43.1887, -70.8845, United States
1548. @1547, Missouri City, 29.563, -95.5365, United States
1549. @1548, Saratoga Springs, 43.0674, -73.7775, United States
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1552. @1551, Brick, 40.06, -74.1099, United States
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1554. @1553, Castle Rock, 39.3763, -104.8535, United States
1555. @1554, Lauderhill, 26.1605, -80.2241, United States
1556. @1555, Broomfield, 39.9542, -105.0526, United States
1557. @1556, Dale City, 38.6473, -77.3459, United States
1558. @1557, Bolingbrook, 41.6901, -88.1021, United States
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1565. @1564, Daytona Beach, 29.1995, -81.0982, United States
1566. @1565, Lodi, 38.1218, -121.2932, United States
1567. @1566, Redlands, 34.0512, -117.1712, United States
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1569. @1568, Dothan, 31.2336, -85.407, United States
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1572. @1571, Mount Vernon, 40.9136, -73.8291, United States
1573. @1572, Centreville, 38.839, -77.4389, United States
1574. @1573, Altoona, 40.5082, -78.4007, United States
1575. @1574, Framingham, 42.3085, -71.4368, United States
1576. @1575, Camden, 39.9361, -75.1073, United States
1577. @1576, Georgetown, 30.666, -97.6966, United States
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1580. @1579, Porterville, 36.0643, -119.0338, United States
1581. @1580, Tamarac, 26.2056, -80.2539, United States
1582. @1581, Glen Burnie, 39.156, -76.6071, United States
1583. @1582, Blacksburg, 37.23, -80.4279, United States
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1585. @1584, Sumter, 33.9392, -80.393, United States
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1594. @1593, Redondo Beach, 33.8577, -118.3765, United States
1595. @1594, Spring Hill, 35.7437, -86.9116, United States
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1599. @1598, El Paso de Robles, 35.6394, -120.656, United States
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1601. @1600, Maple Grove, 45.1089, -93.4626, United States
1602. @1601, Passaic, 40.8574, -74.1282, United States
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1605. @1604, Rogers, 36.317, -94.1531, United States
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1609. @1608, Conway, 35.0753, -92.4692, United States
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1619. @1618, West Des Moines, 41.5521, -93.7806, United States
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1640. @1639, Palatine, 42.118, -88.043, United States
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1642. @1641, Corvallis, 44.5698, -123.2779, United States
1643. @1642, Rockville, 39.0834, -77.1553, United States
1644. @1643, Old Bridge, 40.4004, -74.3126, United States
1645. @1644, Skokie, 42.036, -87.74, United States
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1647. @1646, Mount Vernon, 48.4203, -122.3115, United States
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1675. @1674, San Clemente, 33.4499, -117.6102, United States
1676. @1675, Burnsville, 44.7648, -93.2793, United States
1677. @1676, Spring, 30.0613, -95.383, United States

1678. @1677, **Port Charlotte**, 26.9918, -82.114, United States
1679. @1678, **Eden Prairie**, 44.8488, -93.4595, United States
1680. @1679, **Greenwood**, 39.6019, -86.1073, United States
1681. @1680, **Lower Merion**, 40.0282, -75.2807, United States
1682. @1681, **Millcreek**, 40.6892, -111.8292, United States
1683. @1682, **Bellevue**, 41.1485, -95.939, United States
1684. @1683, **Coon Rapids**, 45.1755, -93.3094, United States
1685. @1684, **Rowlett**, 32.9155, -96.5489, United States
1686. @1685, **Hamilton**, 39.3939, -84.5653, United States
1687. @1686, **Lakewood**, 47.1628, -122.5299, United States
1688. @1687, **Florence-Graham**, 33.9682, -118.2447, United States
1689. @1688, **Commerce City**, 39.8641, -104.843, United States
1690. @1689, **Bossier City**, 32.5224, -93.6668, United States
1691. @1690, **Taylor**, 42.226, -83.2688, United States
1692. @1691, **La Habra**, 33.9282, -117.9515, United States
1693. @1692, **Port Orange**, 29.1085, -81.0137, United States
1694. @1693, **Brookline**, 42.3243, -71.1408, United States
1695. @1694, **Moore**, 35.3293, -97.4757, United States
1696. @1695, **Council Bluffs**, 41.2369, -95.8516, United States
1697. @1696, **Bensalem**, 40.1086, -74.9431, United States
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1702. @1701, **Montebello**, 34.0155, -118.1108, United States
1703. @1702, **Pontiac**, 42.6493, -83.2878, United States
1704. @1703, **Encinitas**, 33.0492, -117.261, United States
1705. @1704, **Queen Creek**, 33.2454, -111.6173, United States
1706. @1705, **Medford**, 42.4234, -71.1087, United States
1707. @1706, **Springfield**, 44.0538, -122.9811, United States
1708. @1707, **Plymouth**, 41.8783, -70.6309, United States
1709. @1708, **Hendersonville**, 36.3063, -86.5997, United States
1710. @1709, **Palm Harbor**, 28.0847, -82.7481, United States
1711. @1710, **Pico Rivera**, 33.9901, -118.0888, United States
1712. @1711, **Marietta**, 33.9533, -84.5422, United States
1713. @1712, **Wellington**, 26.6461, -80.2699, United States
1714. @1713, **Sanford**, 28.7891, -81.2757, United States
1715. @1714, **Woodland**, 38.6712, -121.75, United States
1716. @1715, **Caldwell**, 43.6453, -116.6594, United States
1717. @1716, **Huntersville**, 35.406, -80.8716, United States
1718. @1717, **Bristol**, 41.6812, -72.9407, United States
1719. @1718, **Jupiter**, 26.92, -80.1128, United States
1720. @1719, **San Rafael**, 37.9905, -122.5221, United States
1721. @1720, **La Mesa**, 32.7703, -117.0204, United States
1722. @1721, **Richland**, 46.2824, -119.2939, United States
1723. @1722, **Revere**, 42.4189, -71.004, United States
1724. @1723, **Meriden**, 41.5369, -72.7946, United States
1725. @1724, **Piscataway**, 40.5467, -74.4636, United States
1726. @1725, **Monterey Park**, 34.0497, -118.1326, United States
1727. @1726, **Gardena**, 33.8943, -118.3072, United States
1728. @1727, **Euless**, 32.8508, -97.08, United States
1729. @1728, **Irvington**, 40.7243, -74.2317, United States
1730. @1729, **Clay**, 43.1808, -76.1954, United States
1731. @1730, **Des Plaines**, 42.0345, -87.9008, United States
1732. @1731, **Hamburg**, 42.7394, -78.8581, United States
1733. @1732, **Union**, 40.6953, -74.2697, United States
1734. @1733, **West Allis**, 43.0068, -88.0296, United States
1735. @1734, **North Miami**, 25.9008, -80.1686, United States
1736. @1735, **St. Cloud**, 28.2363, -81.2779, United States
1737. @1736, **The Hammocks**, 25.67, -80.4482, United States
1738. @1737, **Cupertino**, 37.3168, -122.0466, United States
1739. @1738, **Taylorsville**, 40.6569, -111.9493, United States
1740. @1739, **Petaluma**, 38.2423, -122.6266, United States
1741. @1740, **Kokomo**, 40.464, -86.1277, United States
1742. @1741, **Santee**, 32.8554, -116.9851, United States
1743. @1742, **Stonecrest**, 33.6842, -84.1372, United States
1744. @1743, **Taunton**, 41.9036, -71.0943, United States
1745. @1744, **White Plains**, 41.022, -73.7547, United States
1746. @1745, **Palm Beach Gardens**, 26.8466, -80.1679, United States
1747. @1746, **Chapel Hill**, 35.9271, -79.0391, United States
1748. @1747, **Jackson**, 40.098, -74.3578, United States
1749. @1748, **Hoboken**, 40.7452, -74.0281, United States
1750. @1749, **Parker**, 39.5084, -104.7753, United States
1751. @1750, **Blue Springs**, 39.0124, -94.2721, United States
1752. @1751, **Shoreline**, 47.7564, -122.3426, United States
1753. @1752, **St. Clair Shores**, 42.4925, -82.8961, United States
1754. @1753, **Horizon West**, 28.4417, -81.6146, United States
1755. @1754, **Margate**, 26.2466, -80.2119, United States
1756. @1755, **Orland Park**, 41.6075, -87.8619, United States
1757. @1756, **Abington**, 40.1108, -75.1146, United States
1758. @1757, **Carson City**, 39.1511, -119.7476, United States
1759. @1758, **Midwest City**, 35.463, -97.371, United States
1760. @1759, **Royal Oak**, 42.5084, -83.1539, United States
1761. @1760, **Bowie**, 38.9549, -76.7406, United States
1762. @1761, **Kettering**, 39.6956, -84.1494, United States
1763. @1762, **St. Peters**, 38.7825, -90.6061, United States
1764. @1763, **Oak Lawn**, 41.7139, -87.7528, United States
1765. @1764, **Towson**, 39.3944, -76.619, United States

1766. @1765, **Coconut Creek**, 26.2803, -80.1842, United States
1767. @1766, **Decatur**, 34.5731, -86.9905, United States
1768. @1767, **Lenexa**, 38.9609, -94.8018, United States
1769. @1768, **Bartlett**, 35.2337, -89.8195, United States
1770. @1769, **South Whittier**, 33.9336, -118.0312, United States
1771. @1770, **Weymouth**, 42.1981, -70.9466, United States
1772. @1771, **Lake Havasu City**, 34.5006, -114.3113, United States
1773. @1772, **Bel Air South**, 39.5022, -76.3113, United States
1774. @1773, **Fountainebleau**, 25.7723, -80.346, United States
1775. @1774, **Wylie**, 33.0362, -96.5161, United States
1776. @1775, **Madison**, 34.7114, -86.7626, United States
1777. @1776, **Brookhaven**, 33.8743, -84.3314, United States
1778. @1777, **Highland**, 34.1113, -117.165, United States
1779. @1778, **Fountain Valley**, 33.7105, -117.9514, United States
1780. @1779, **Berwyn**, 41.8433, -87.7909, United States
1781. @1780, **Severn**, 39.1355, -76.6956, United States
1782. @1781, **Albany**, 44.6272, -123.0965, United States
1783. @1782, **National City**, 32.6654, -117.0983, United States
1784. @1783, **Lacey**, 47.0462, -122.7933, United States
1785. @1784, **Mount Prospect**, 42.0641, -87.9375, United States
1786. @1785, **Arcadia**, 34.1342, -118.0373, United States
1787. @1786, **Parsippany-Troy Hills**, 40.8601, -74.4237, United States
1788. @1787, **DeSoto**, 32.5992, -96.8633, United States
1789. @1788, **Smyrna**, 33.8633, -84.5168, United States
1790. @1789, **Bradenton**, 27.4901, -82.5757, United States
1791. @1790, **Union**, 42.1258, -76.0329, United States
1792. @1791, **New Brunswick**, 40.487, -74.445, United States
1793. @1792, **Apple Valley**, 44.7457, -93.2004, United States
1794. @1793, **Tinley Park**, 41.567, -87.8049, United States
1795. @1794, **Sarasota**, 27.3387, -82.5432, United States
1796. @1795, **Hacienda Heights**, 33.997, -117.9727, United States
1797. @1796, **Chicopee**, 42.1764, -72.5719, United States
1798. @1797, **West Haven**, 41.2739, -72.9672, United States
1799. @1798, **Herriman**, 40.4899, -112.017, United States
1800. @1799, **Perth Amboy**, 40.5202, -74.2724, United States
1801. @1800, **Casa Grande**, 32.9069, -111.7624, United States
1802. @1801, **Tigard**, 45.4237, -122.7845, United States
1803. @1802, **Apopka**, 28.7015, -81.5316, United States
1804. @1803, **Southaven**, 34.9514, -89.9786, United States
1805. @1804, **Huntington Park**, 33.98, -118.2167, United States
1806. @1805, **Diamond Bar**, 33.9992, -117.8161, United States
1807. @1806, **Bentonville**, 36.3547, -94.2305, United States
1808. @1807, **Yucaipa**, 34.0336, -117.0429, United States
1809. @1808, **Plainfield**, 40.6154, -74.4157, United States
1810. @1809, **Manhattan**, 39.1886, -96.6048, United States
1811. @1810, **Aspen Hill**, 39.0927, -77.0826, United States
1812. @1811, **Rocky Mount**, 35.9685, -77.804, United States
1813. @1812, **Bristol**, 40.1216, -74.8667, United States
1814. @1813, **Peabody**, 42.5335, -70.9725, United States
1815. @1814, **West Sacramento**, 38.5557, -121.5505, United States
1816. @1815, **Wayne**, 40.9481, -74.2453, United States
1817. @1816, **San Jacinto**, 33.797, -116.9916, United States
1818. @1817, **Kentwood**, 42.8852, -85.5926, United States
1819. @1818, **Colton**, 34.0538, -117.3255, United States
1820. @1819, **Millcreek**, 42.0859, -80.1194, United States
1821. @1820, **Oak Park**, 41.8872, -87.7899, United States
1822. @1821, **Westchester**, 25.7471, -80.3523, United States
1823. @1822, **Smyrna**, 35.9687, -86.5264, United States
1824. @1823, **Wheaton**, 41.8561, -88.1085, United States
1825. @1824, **Lower Paxton**, 40.3183, -76.7983, United States
1826. @1825, **Beaumont**, 33.9076, -116.9766, United States
1827. @1826, **Aloha**, 45.492, -122.8725, United States
1828. @1827, **Minnetonka**, 44.9322, -93.4598, United States
1829. @1828, **Howell**, 40.1819, -74.1976, United States
1830. @1829, **Pinellas Park**, 27.8589, -82.7078, United States
1831. @1830, **Kannapolis**, 35.4764, -80.6408, United States
1832. @1831, **Paramount**, 33.8977, -118.1651, United States
1833. @1832, **Texas City**, 29.4154, -94.9682, United States
1834. @1833, **Novato**, 38.092, -122.5575, United States
1835. @1834, **Edina**, 44.8914, -93.3602, United States
1836. @1835, **Normal**, 40.5217, -88.9884, United States
1837. @1836, **Tamiami**, 25.7556, -80.4016, United States
1838. @1837, **Grand Island**, 40.9218, -98.3586, United States
1839. @1838, **Methuen Town**, 42.734, -71.1889, United States
1840. @1839, **Elyria**, 41.376, -82.106, United States
1841. @1840, **Wheaton**, 39.0492, -77.0573, United States
1842. @1841, **Kendale Lakes**, 25.7081, -80.4078, United States
1843. @1842, **Bloomfield**, 40.8098, -74.1869, United States
1844. @1843, **Marana**, 32.4355, -111.1558, United States
1845. @1844, **West New York**, 40.7857, -74.0094, United States
1846. @1845, **Twin Falls**, 42.5645, -114.4613, United States
1847. @1846, **Florissant**, 38.7996, -90.3269, United States
1848. @1847, **Glendora**, 34.1449, -117.8467, United States
1849. @1848, **Cathedral City**, 33.8362, -116.4642, United States
1850. @1849, **Aliso Viejo**, 33.5792, -117.7289, United States
1851. @1850, **Placentia**, 33.8807, -117.8553, United States
1852. @1851, **Hoffman Estates**, 42.064, -88.1468, United States
1853. @1852, **Burien**, 47.4762, -122.3394, United States

1854. @1853, **Dunwoody**, 33.9418, -84.3122, United States
 1855. @1854, **Palm Desert**, 33.7378, -116.3695, United States
 1856. @1855, **Troy**, 42.7354, -73.6751, United States
 1857. @1856, **Collierville**, 35.047, -89.6987, United States
 1858. @1857, **Levittown**, 40.1533, -74.8531, United States
 1859. @1858, **Rosemead**, 34.0689, -118.0823, United States
 1860. @1859, **Country Club**, 25.9407, -80.3102, United States
 1861. @1860, **Enid**, 36.4063, -97.87, United States
 1862. @1861, **Cuyahoga Falls**, 41.1641, -81.5207, United States
 1863. @1862, **Mishawaka**, 41.6742, -86.1666, United States
 1864. @1863, **Columbus**, 39.2093, -85.9183, United States
 1865. @1864, **Summerville**, 33.0016, -80.1799, United States
 1866. @1865, **Levittown**, 40.7241, -73.5125, United States
 1867. @1866, **Irondequoit**, 43.2096, -77.5705, United States
 1868. @1867, **Grapevine**, 32.9343, -97.0742, United States
 1869. @1868, **Covina**, 34.0903, -117.8818, United States
 1870. @1869, **Milford city**, 41.2255, -73.0625, United States
 1871. @1870, **Draper**, 40.4957, -111.8605, United States
 1872. @1871, **Lakewood**, 41.4822, -81.8008, United States
 1873. @1872, **Catalina Foothills**, 32.3046, -110.8838, United States
 1874. @1873, **Delano**, 35.7662, -119.2635, United States
 1875. @1874, **Haverford**, 39.9868, -75.3164, United States
 1876. @1875, **Lincoln**, 38.8774, -121.2937, United States
 1877. @1876, **Murray**, 40.6498, -111.8874, United States
 1878. @1877, **Mooresville**, 35.5847, -80.8266, United States
 1879. @1878, **Downers Grove**, 41.7949, -88.0172, United States
 1880. @1879, **Florin**, 38.4832, -121.4043, United States
 1881. @1880, **Cypress**, 33.8171, -118.0386, United States
 1882. @1881, **Jeffersonville**, 38.3376, -85.7026, United States
 1883. @1882, **North Bethesda**, 39.0393, -77.1191, United States
 1884. @1883, **Azusa**, 34.1386, -117.9124, United States
 1885. @1884, **Coral Gables**, 25.7037, -80.2715, United States
 1886. @1885, **Chesterfield**, 38.6589, -90.5803, United States
 1887. @1886, **McLean**, 38.9436, -77.1943, United States
 1888. @1887, **St. Louis Park**, 44.9488, -93.3649, United States
 1889. @1888, **East Honolulu**, 21.2975, -157.7211, United States
 1890. @1889, **East Brunswick**, 40.4281, -74.4179, United States
 1891. @1890, **Bedford**, 32.8464, -97.135, United States
 1892. @1891, **Euclid**, 41.5903, -81.5188, United States
 1893. @1892, **Montevideo**, -34.8836, -56.1819, Uruguay
 1894. @1893, **Maldonado**, -34.9, -54.95, Uruguay
 1895. @1894, **Tashkent**, 41.3111, 69.2797, Uzbekistan
 1896. @1895, **Namangan**, 41.0011, 71.6683, Uzbekistan
 1897. @1896, **Port-Vila**, -17.7333, 168.3167, Vanuatu
 1898. @1897, **Vatican City**, 41.904, 12.453, Vatican City
 1899. @1898, **Caracas**, 10.4806, -66.9036, Venezuela
 1900. @1899, **Maracaibo**, 10.6333, -71.6333, Venezuela
 1901. @1900, **Hanoi**, 21.105.85, Vietnam
 1902. @1901, **Haiphong**, 20.8651, 106.6838, Vietnam
 1903. @1902, **Road Town**, 18.4167, -64.6167, "Virgin Islands, British"
 1904. @1903, **Mata-Utu**, -13.2833, -176.1833, Wallis and Futuna
 1905. @1904, **Hebron**, 31.5286, 35.0969, West Bank
 1906. @1905, **Nablus**, 32.2222, 35.2611, West Bank
 1907. @1906, **Sanaa**, 15.3483, 44.2064, Yemen
 1908. @1907, **Lusaka**, -15.4167, 28.2833, Zambia
 1909. @1908, **Ndola**, 12.9689, 28.6325, Zambia
 1910. @1909, **Harare**, -17.8292, 31.0522, Zimbabwe
 1911. @1910, **Masvingo**, -20.0744, 30.8328, Zimbabwe

GUI.java

```

1. ****
2.
3. * File name:
4.
5. * GUI.java
6.
7. *
8.
9. * Description:
10.
11. * This file defines the GUI components and layout for the application.
12.
13. *
14.
15. * Author:
16.
17. * Sarwan Heer
18.
19. *
20.
21. * Date: April 7, 2024
22.
23. *
24.
25. * Concepts:
```

```
26.
27. * Swing GUI components
28.
29. * Layout management
30.
31. ****
32. import java.awt.*;
33. import java.awt.event.*;
34. import javax.swing.*;
35. import java.awt.image.BufferedImage;
36. import javax.imageio.ImageIO;
37. import java.io.IOException;
38.
39. public class GUI {
40.     private static JTextField city1TextField;
41.     private static JTextField city2TextField;
42.     private static JTextField city1LatTextField;
43.     private static JTextField city1LngTextField;
44.     private static JTextField city2LatTextField;
45.     private static JTextField city2LngTextField;
46. }
47.
48. * Method name:
49.
50. * createAndShowGUI
51.
52. *
53.
54. * Description:
55.
56. * Initializes and displays the graphical user interface (GUI) for the application.
57.
58. *
59.
60. * Parameters:
61.
62. * None
63.
64. *
65.
66. * Restrictions:
67.
68. * None
69.
70. *
71.
72. * Return:
73.
74. * void
75.
76. *
77.
78. * Restrictions:
79.
80. * None
81.
82. ****
83.
84. public static void createAndShowGUI() {
85.     JFrame frame = new JFrame("Haversine Distance Calculator");
86.     frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
87.     frame.getContentPane().setLayout(new BorderLayout());
88.
89.     // Define the preferred width and height for the frame
90.     int frameWidth = 800;
91.     int frameHeight = 600;
92.
93.     // Top Section: Blue Banner
94.     JPanel topPanel = new JPanel();
95.     topPanel.setBackground(Color.BLUE);
96.     topPanel.setLayout(new BoxLayout(topPanel, BoxLayout.Y_AXIS));
97.     topPanel.setBorder(BorderFactory.createEmptyBorder(20, 20, 20, 20)); // Add padding
98.
99.     // Load the image
100.    ImageIcon icon = new ImageIcon("haversine.png");
101.
102.    // Create a Label for the image
103.    JLabel lblImage = new JLabel(icon);
104.
105.    // Center the image within the blue panel
106.    lblImage.setHorizontalAlignment(SwingConstants.CENTER);
107.    lblImage.setVerticalAlignment(SwingConstants.CENTER);
108.
109.    // Add the Label to the blue panel
110.    topPanel.add(lblImage);
111.
112.    // White Banner: Text Description
113.    JPanel whiteBanner = new JPanel();
```

```

114. whiteBanner.setBackground(Color.WHITE);
115. whiteBanner.setLayout(new BorderLayout());
116. whiteBanner.setBorder(BorderFactory.createEmptyBorder(20, 40, 20, 20)); // Add padding
117.
118. JTextArea descriptionTextArea = new JTextArea(
119.     "Enter the names of two cities and press the find button.\n" +
120.     "Or press random for the system to select two random cities from our database.\n" +
121.     "If the information shown is correct then press calculate button."
122. );
123. descriptionTextArea.setEditable(false); // Make the text area non-editable
124. descriptionTextArea.setLineWrap(true); // Enable automatic Line wrapping
125. descriptionTextArea.setWrapStyleWord(true); // Wrap at word boundaries
126.
127. // Calculate preferred size of the JTextArea based on the text content
128. descriptionTextArea.setPreferredSize(new Dimension(400, 100)); // Adjust size as needed
129.
130. whiteBanner.add(descriptionTextArea, BorderLayout.CENTER);
131.
132. topPanel.add(whiteBanner);
133.
134. frame.add(topPanel, BorderLayout.NORTH);
135.
136. // Middle Section: Red Banner
137. JPanel middlePanel = new JPanel();
138. middlePanel.setBackground(Color.RED);
139. middlePanel.setLayout(new GridLayout(3, 3)); // 3 rows, 3 columns
140. middlePanel.setBorder(BorderFactory.createEmptyBorder(20, 20, 20, 20)); // Add padding
141.
142. // Labels
143. String[] labels = {"City", "Longitude", "Latitude"};
144. for (String label : labels) {
145.     JLabel lbl = new JLabel(label);
146.     lbl.setHorizontalAlignment(SwingConstants.CENTER);
147.     middlePanel.add(lbl);
148. }
149.
150. /*
151. * Loop to configure text fields in the middle panel
152. */
153.
154. /*
155. for (int i = 0; i < 2; i++) { // Loop for two rows
156.     for (int j = 0; j < 3; j++) { // Loop for three columns
157.         JTextField textField = new JTextField();
158.         if (j == 0) {
159.             textField.setEditable(true); // Make text fields in City column editable
160.             if (i == 0) {
161.                 city1TextField = textField; // Assign the first editable text field to city1TextField
162.                 textField.setText("City1");
163.             } else {
164.                 city2TextField = textField; // Assign the second editable text field to city2TextField
165.                 textField.setText("City2");
166.             }
167.         } else {
168.             textField.setEditable(false); // Make other text fields non-editable
169.             if (i == 0) {
170.                 if (j == 1) {
171.                     city1LngTextField = textField; // Assign the first non-editable text field for Longitude
172.                 } else if (j == 2) {
173.                     city1LatTextField = textField; // Assign the first non-editable text field for Latitude
174.                 }
175.             } else {
176.                 if (j == 1) {
177.                     city2LngTextField = textField; // Assign the second non-editable text field for Longitude
178.                 } else if (j == 2) {
179.                     city2LatTextField = textField; // Assign the second non-editable text field for Latitude
180.                 }
181.             }
182.         }
183.         textField.setHorizontalAlignment(SwingConstants.CENTER);
184.         // Set preferred size to make text fields smaller
185.         textField.setPreferredSize(new Dimension(100, 30));
186.         middlePanel.add(textField);
187.     }
188. }
189.
190. frame.add(middlePanel, BorderLayout.CENTER);
191.
192. // Bottom Section: Buttons
193. JPanel bottomPanel = new JPanel();
194. bottomPanel.setLayout(new GridLayout(1, 5)); // 1 row, 5 columns
195. bottomPanel.setBorder(BorderFactory.createEmptyBorder(20, 20, 20, 20)); // Add padding
196.
197. // Create buttons with specified colors
198. JButton findButton = createButton("Find", Color.GREEN);
199. JButton randomButton = createButton("Random", Color.BLUE);
200. JButton calculateButton = createButton("Calculate", new Color(128, 0, 128)); // Purple color
201. JButton clearButton = createButton("Clear", Color.RED);

```

```
202.         JButton exitButton = createButton("Exit", Color.GRAY);
203.
204.         // Add action listeners to buttons
205.         findButton.addActionListener(new ActionListener() {
206.             public void actionPerformed(ActionEvent e) {
207.                 Actions.findButtonClicked();
208.             }
209.         });
210.
211.         randomButton.addActionListener(new ActionListener() {
212.             public void actionPerformed(ActionEvent e) {
213.                 Actions.randomButtonClicked();
214.             }
215.         });
216.
217.         calculateButton.addActionListener(new ActionListener() {
218.             public void actionPerformed(ActionEvent e) {
219.                 Actions.calculateButtonClicked();
220.             }
221.         });
222.
223.         clearButton.addActionListener(new ActionListener() {
224.             public void actionPerformed(ActionEvent e) {
225.                 Actions.clearButtonClicked();
226.             }
227.         });
228.
229.         exitButton.addActionListener(new ActionListener() {
230.             public void actionPerformed(ActionEvent e) {
231.                 Actions.exitButtonClicked();
232.             }
233.         });
234.
235.         // Add buttons to bottom panel
236.         bottomPanel.add(findButton);
237.         bottomPanel.add(randomButton);
238.         bottomPanel.add(calculateButton);
239.         bottomPanel.add(clearButton);
240.         bottomPanel.add(exitButton);
241.
242.         frame.add(bottomPanel, BorderLayout.SOUTH);
243.
244.         // Set the preferred size of the frame
245.         frame.setPreferredSize(new Dimension(frameWidth, frameHeight));
246.
247.         // Center the frame on the screen
248.         frame.pack();
249.         frame.setLocationRelativeTo(null);
250.
251.         // Make the frame visible
252.         frame.setVisible(true);
253.     } /* End of createAndShowGUI method */
254.
255.     private static JButton createButton(String text, Color color) {
256.         JButton button = new JButton(text);
257.         button.setBackground(color);
258.         return button;
259.     }
260.
261.     // Getter methods for text fields
262.     public static JTextField getCity1TextField() {
263.         return city1TextField;
264.     }
265.
266.     public static JTextField getCity2TextField() {
267.         return city2TextField;
268.     }
269.
270.     public static JTextField getCity1LngTextField() {
271.         return city1LngTextField;
272.     }
273.
274.     public static JTextField getCity1LatTextField() {
275.         return city1LatTextField;
276.     }
277.
278.     public static JTextField getCity2LngTextField() {
279.         return city2LngTextField;
280.     }
281.
282.     public static JTextField getCity2LatTextField() {
283.         return city2LatTextField;
284.     }
285. } /* End of GUI class */
```

```
1. ****
2.
3. * File name:
4.
5. * Main.java
6.
7. *
8.
9. * Description:
10.
11. * This file contains the main method to initialize the Swing GUI application.
12.
13. *
14.
15. * Author:
16.
17. * Sarwan Heer
18.
19. *
20.
21. * Date: April 7, 2024
22.
23. *
24.
25. * Concepts:
26.
27. * Swing GUI initialization
28.
29. * Event dispatch thread management
30.
31. ****
32. import javax.swing.*;
33.
34. public class Main {
35.     public static void main(String[] args) {
36.         SwingUtilities.invokeLater(new Runnable() {
37.             public void run() {
38.                 GUI.createAndShowGUI();
39.             }
40.         });
41.     }
42. } /* End of Main class */
```

haversine.png

```
1. https://codehs.com/uploads/6c58dad0ea41d4d856a88f670a43e8b
```