7.1a

```
In [126]:  import os
           import json
           from pathlib import Path
           import gzip
           import pandas as pd
           import s3fs
           import hashlib
           endpoint_url='https://storage.budsc.midwest-datascience.com'
           current_dir = Path(os.getcwd()).absolute()
           results_dir = current_dir.joinpath('results')
           results_dir.mkdir(parents=True, exist_ok=True)
           def read_jsonl_data():
               s3 = s3fs.S3FileSystem(
                   anon=True,
                   client_kwargs={
                       'endpoint_url': endpoint_url
                   }
               )
               src_data_path = 'data/processed/openflights/routes.jsonl.gz'
               with s3.open(src_data_path, 'rb') as f_gz:
                   with gzip.open(f_gz, 'rb') as f:
                       records = [json.loads(line) for line in f.readlines()]
               return records
           def flatten_record(record):
               flat_record = dict()
               for key, value in record.items():
                   if key in ['airline', 'src_airport', 'dst_airport']:
                       if isinstance(value, dict):
                           for child_key, child_value in value.items():
                               flat_key = '{}_{}'.format(key, child_key)
                               flat_record[flat_key] = child_value
                   else:
                       flat_record[key] = value
               return flat_record
           def create_flattened_dataset():
               records = read_jsonl_data()
               parquet_path = results_dir.joinpath('routes-flattened.parquet')
               return pd.DataFrame.from_records([flatten_record(record) for record in rec
           ords])
           df = create_flattened_dataset()
```
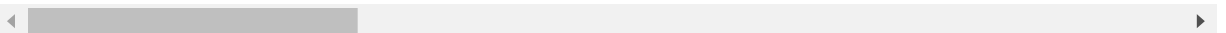
In [127]:
```
df
```

Out[127]:

	airline_airline_id	airline_name	airline_alias	airline_iata	airline_icao	airline_callsign	airli
0	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
1	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
2	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
3	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
4	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
...	...	...	...	...	...	...	
67658	4178	Regional Express	Qantas Airways	ZL	RXA	REX	
67659	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67660	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67661	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67662	19016	Apache Air	Apache	ZM	IWA	APACHE	U

67663 rows × 38 columns

In [128]:
```python
partitions = (
        ('A', 'A'), ('B', 'B'), ('C', 'D'), ('E', 'F'),
        ('G', 'H'), ('I', 'J'), ('K', 'L'), ('M', 'M'),
        ('N', 'N'), ('O', 'P'), ('Q', 'R'), ('S', 'T'),
        ('U', 'U'), ('V', 'V'), ('W', 'X'), ('Y', 'Z')
    )
kv_key = (
        'A', 'B', 'C-D', 'E-F',
        'G-H', 'I-J', 'K-L', 'M',
        'N', 'O-P', 'Q-R', 'S-T',
        'U', 'V', 'W-X', 'Y-Z'
    )
```

In [129]:
```python
df['key'] = df.apply(lambda row: str(row.src_airport_iata).upper() + str(row.d
st_airport_iata).upper()
                     + str(row.airline_iata).upper(), axis = 1)
```

In [130]:
```python
#df['kv_key'] = df['key'].str.get(0)
kv_list = []
getout = 0
for row in df['key']:
    success, counter = 0, 0
    first = row[0:1]
    for partition in partitions:
        if (partition[0] == first) or (partition[1] == first):
            kv_list.append(kv_key[counter])
            success = 1
        counter += 1
    if success == 0:
        print(row)
```
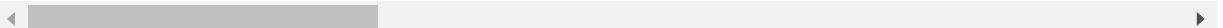
In [131]:
```python
df['kv_key'] = kv_list
```

In [132]:
```python
df
```

Out[132]:

	airline_airline_id	airline_name	airline_alias	airline_iata	airline_icao	airline_callsign	airli
0	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
1	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
2	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
3	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
4	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
...	...	...	...	...	...	...	
67658	4178	Regional Express	Qantas Airways	ZL	RXA	REX	
67659	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67660	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67661	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67662	19016	Apache Air	Apache	ZM	IWA	APACHE	U

67663 rows × 40 columns

```
In [111]:  kv_dir = results_dir.joinpath('kv2')
           kv_dir.mkdir(parents=True, exist_ok=True)
           df.to_parquet(kv_dir, partition_cols = ['kv_key'])
```

7.1b

```
In [133]:  import hashlib
           def hash_key(key):
               m = hashlib.sha256()
               m.update(str(key).encode('utf-8'))
               return m.hexdigest()

           df['hashed'] = df.apply(lambda row: hash_key(row.key), axis = 1)

           df['hash_key'] = df.apply(lambda row: row.hashed[0].upper(), axis = 1)
```

In [134]: `df`

Out[134]:

	airline_airline_id	airline_name	airline_alias	airline_iata	airline_icao	airline_callsign	airli
0	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
1	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
2	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
3	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
4	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
...	...	...	...	...	...	...	
67658	4178	Regional Express	Qantas Airways	ZL	RXA	REX	
67659	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67660	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67661	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67662	19016	Apache Air	Apache	ZM	IWA	APACHE	U

67663 rows × 42 columns

In [114]:
```
hash_dir = results_dir.joinpath('hash')
hash_dir.mkdir(parents=True, exist_ok=True)
df.to_parquet(hash_dir, partition_cols = ['hash_key'])
```

7.1c

In [135]:
```python
import pygeohash

def datacenter_search(latitude, longitude, west, central, east):

    target = pygeohash.encode(latitude, longitude, precision = 5)
    distancew = pygeohash.geohash_haversine_distance(target, west)
    distancec = pygeohash.geohash_haversine_distance(target, central)
    distancee = pygeohash.geohash_haversine_distance(target, east)

    if (distancew < distancec) and (distancew < distancee):
        return 'west'
    elif (distancec < distancew) and (distancec < distancee):
        return 'central'
    else:
        return 'east'
```

In [136]:
```python
west = pygeohash.encode(45.5945645, 121.1786823, precision = 5)
central = pygeohash.encode(41.1544433, 96.0422378, precision = 5)
east = pygeohash.encode(39.08344, 77.6497145, precision = 5)

df['location'] = df.apply(
    lambda row: datacenter_search(row.src_airport_latitude,row.src_airport_longitude,
                                  west, central, east), axis = 1)
```

In [138]:
```python
geo_dir = results_dir.joinpath('geo')
geo_dir.mkdir(parents=True, exist_ok=True)
df.to_parquet(geo_dir, partition_cols = ['location'])
```

`In [137]:` `df`

`Out[137]:`

	airline_airline_id	airline_name	airline_alias	airline_iata	airline_icao	airline_callsign	airli
0	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
1	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
2	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
3	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
4	410	Aerocondor	ANA All Nippon Airways	2B	ARD	AEROCONDOR	
...	...	...	...	...	...	...	
67658	4178	Regional Express	Qantas Airways	ZL	RXA	REX	
67659	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67660	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67661	19016	Apache Air	Apache	ZM	IWA	APACHE	U
67662	19016	Apache Air	Apache	ZM	IWA	APACHE	U

67663 rows × 43 columns

7.1d

```python
In [175]:  def balance_partitions(keys, num_partitions):
               partitions = []
               keys.sort()                                 # Sorts the keys.
               batch = int(len(keys) / num_partitions)     # Figures out how many keys per p
           artition, rounded down.
               remainder = len(keys) % num_partitions      # Figures out the remainder to di
           stribute the keys that don't fit.
               #print(batch)
               #print(remainder)
               batch_counter = 0
               batch_list = []
               for x in keys:
                   #print(x)
                   #print(batch_counter)
                   if batch_counter < batch:
                       batch_list.append(x)
                   elif remainder > 0:                     # Allocates a single key to the
            first x partitions, where x = remainder.
                       batch_list.append(x)
                       remainder -= 1
                   else:
                       #print(batch_list)
                       partitions.append(batch_list)       # When the keys in the batch hi
           t the max bax size, add that list to partitions
                       batch_counter = 0                   # and reset.
                       batch_list = [x]
                   batch_counter += 1
               partitions.append(batch_list)               # Add the last batch to the par
           tition.
               return partitions


           keys = ['A1', 'A3', 'B6', 'R4', 'B1', 'X4', 'A2', 'H2', 'V4', 'S3']
           balance_partitions(keys, 3)
```

```
Out[175]:  [['A1', 'A2', 'A3', 'B1'], ['B6', 'H2', 'R4'], ['S3', 'V4', 'X4']]
```

```python
In [179]: wdw = ['Astro Orbiter',                        # To scale up, we used a list of
          every ride at WDW, sorted by park initially.
          'The Barnstormer',
          'Big Thunder Mountain Railroad',
          'Buzz Lightyear\'s Space Ranger Spin',
          'Casey Jr, Splash \'N\' Soak Station',
          'Cinderella Castle',
          'Country Bear Jamboree',
          'Dumbo the Flying Elephant',
          'Enchanted Tales with Belle',
          'Enchanted Tiki Room',
          'Frontierland Shootin\' Arcade',
          'The Hall of Presidents',
          'Haunted Mansion',
          'It\'s a Small World',
          'Jungle Cruise',
          'Liberty Square Riverboat',
          'Mad Tea Party',
          'The Magic Carpets of Aladdin',
          'Main Street Vehicles — Themed Area',
          'The Many Adventures of Winnie the Pooh',
          'Mickey\'s PhilharMagic',
          'Mickey\'s Royal Friendship Faire stage show',
          'Monsters, Inc. Laugh Floor',
          'Peter Pan\'s Flight',
          'A Pirate\'s Adventure ~ Treasures of the Seven Seas',
          'Pirates of the Caribbean',
          'Prince Charming Regal Carrousel',
          'Seven Dwarfs Mine Train',
          'Sorcerers of the Magic Kingdom[1]',
          'Space Mountain',
          'Splash Mountain',
          'Swiss Family Treehouse',
          'Tom Sawyer Island',
          'Tomorrowland Speedway',
          'Tomorrowland Transit Authority PeopleMover',
          'Under the Sea ~ Journey of The Little Mermaid',
          'Walt Disney World Railroad',
          'Walt Disney\'s Carousel of Progress',
          'Advanced Training Lab',
          'The American Adventure',
          'American Heritage Gallery',
          'Awesome Planet',
          'Beauty and the Beast: Sing-Along',
          'Bijutsu-kan Gallery',
          'Canada: Far and Wide',
          'Disney & Pixar Short Film Festival',
          'Meet and Greet Anna and Elsa from Frozen',
          'Gallery of Arts and History',
          'Gran Fiesta Tour Starring The Three Caballeros',
          'House of the Whispering Willows',
          'ImageWorks: The What-If Labs',
          'Impressions de France',
          'Journey into Imagination with Figment',
          'Kidcot Fun Stops',
          'Living with the Land',
```

```
'Frozen Ever After',
'Mexico Folk Art Gallery',
'Mission: SPACE',
'Project Tomorrow: Inventing the Wonders of the Future',
'Reflections of China',
'SeaBase',
'The Seas with Nemo & Friends',
'Soarin\'',
'Spaceship Earth',
'Stave Church Gallery',
'Test Track',
'Turtle Talk with Crush',
'Alien Swirling Saucers',
'Beauty and the Beast Live on Stage',
'Celebrity Spotlight',
'Disney Junior Play & Dance!',
'Fantasmic!',
'For the First Time in Forever: A Frozen Sing-Along Celebration',
'Mickey and Minnie\'s Runaway Railway',
'Indiana Jones Epic Stunt Spectacular!',
'Jedi Training: Trials of the Temple',
'Lightning McQueen\'s Racing Academy',
'Mickey Short Theater',
'Millennium Falcon Smugglers Run',
'Muppet*Vision 3D',
'Rise of the Resistance',
'Rock \'n\' Roller Coaster Starring Aerosmith',
'Slinky Dog Dash',
'Star Wars Launch Bay',
'Star Tours: The Adventures Continue',
'Star Wars: A Galactic Spectacular',
'Toy Story Mania!',
'The Twilight Zone Tower of Terror',
'Voyage of the Little Mermaid',
'Walt Disney Presents',
'Affection Section',
'Avatar Flight of Passage',
'The Boneyard',
'Conservation Station',
'Cretaceous Trail',
'Dinosaur',
'Dino Sue',
'Discovery Island Trails',
'Expedition Everest: Legend of the Forbidden Mountain',
'Fossil Fun Games',
'Finding Nemo - The Musical',
'Habitat Habit!',
'It\'s Tough to be a Bug!',
'Kali River Rapids',
'Kilimanjaro Safaris',
'Maharajah Jungle Trek',
'Na\'vi River Journey',
'The Oasis Exhibits',
'Pangani Forest Exploration Trail',
'Tree of Life',
'TriceraTop Spin',
'UP! A Great Bird Adventure',
```

```
 'Wild Africa Trek',
 'Wilderness Explorers',
 'Wildlife Express Train',
 'Festival of the Lion King']
```

```
 'Wild Africa Trek',
 'Wilderness Explorers',
 'Wildlife Express Train',
```

In [180]: wdw

```
Out[180]: ['Astro Orbiter',
           'The Barnstormer',
           'Big Thunder Mountain Railroad',
           "Buzz Lightyear's Space Ranger Spin",
           "Casey Jr, Splash 'N' Soak Station",
           'Cinderella Castle',
           'Country Bear Jamboree',
           'Dumbo the Flying Elephant',
           'Enchanted Tales with Belle',
           'Enchanted Tiki Room',
           "Frontierland Shootin' Arcade",
           'The Hall of Presidents',
           'Haunted Mansion',
           "It's a Small World",
           'Jungle Cruise',
           'Liberty Square Riverboat',
           'Mad Tea Party',
           'The Magic Carpets of Aladdin',
           'Main Street Vehicles\xa0- Themed Area',
           'The Many Adventures of Winnie the Pooh',
           "Mickey's PhilharMagic",
           "Mickey's Royal Friendship Faire stage show",
           'Monsters, Inc. Laugh Floor',
           "Peter Pan's Flight",
           "A Pirate's Adventure ~ Treasures of the Seven Seas",
           'Pirates of the Caribbean',
           'Prince Charming Regal Carrousel',
           'Seven Dwarfs Mine Train',
           'Sorcerers of the Magic Kingdom[1]',
           'Space Mountain',
           'Splash Mountain',
           'Swiss Family Treehouse',
           'Tom Sawyer Island',
           'Tomorrowland Speedway',
           'Tomorrowland Transit Authority PeopleMover',
           'Under the Sea ~ Journey of The Little Mermaid',
           'Walt Disney World Railroad',
           "Walt Disney's Carousel of Progress",
           'Advanced Training Lab',
           'The American Adventure',
           'American Heritage Gallery',
           'Awesome Planet',
           'Beauty and the Beast: Sing-Along',
           'Bijutsu-kan Gallery',
           'Canada: Far and Wide',
           'Disney & Pixar Short Film Festival',
           'Meet and Greet Anna and Elsa from Frozen',
           'Gallery of Arts and History',
           'Gran Fiesta Tour Starring The Three Caballeros',
           'House of the Whispering Willows',
           'ImageWorks: The What-If Labs',
           'Impressions de France',
           'Journey into Imagination with Figment',
           'Kidcot Fun Stops',
           'Living with the Land',
           'Frozen Ever After',
           'Mexico Folk Art Gallery',
```

```
'Mission: SPACE',
'Project Tomorrow: Inventing the Wonders of the Future',
'Reflections of China',
'SeaBase',
'The Seas with Nemo & Friends',
"Soarin'",
'Spaceship Earth',
'Stave Church Gallery',
'Test Track',
'Turtle Talk with Crush',
'Alien Swirling Saucers',
'Beauty and the Beast Live on Stage',
'Celebrity Spotlight',
'Disney Junior Play & Dance!',
'Fantasmic!',
'For the First Time in Forever: A Frozen Sing-Along Celebration',
"Mickey and Minnie's Runaway Railway",
'Indiana Jones Epic Stunt Spectacular!',
'Jedi Training: Trials of the Temple',
"Lightning McQueen's Racing Academy",
'Mickey Short Theater',
'Millennium Falcon Smugglers Run',
'Muppet*Vision 3D',
'Rise of the Resistance',
"Rock 'n' Roller Coaster Starring Aerosmith",
'Slinky Dog Dash',
'Star Wars Launch Bay',
'Star Tours: The Adventures Continue',
'Star Wars: A Galactic Spectacular',
'Toy Story Mania!',
'The Twilight Zone Tower of Terror',
'Voyage of the Little Mermaid',
'Walt Disney Presents',
'Affection Section',
'Avatar\xa0Flight of Passage',
'The Boneyard',
'Conservation Station',
'Cretaceous Trail',
'Dinosaur',
'Dino Sue',
'Discovery Island\xa0Trails',
'Expedition Everest: Legend of the Forbidden Mountain',
'Fossil Fun Games',
'Finding Nemo - The Musical',
'Habitat Habit!',
"It's Tough to be a Bug!",
'Kali River Rapids',
'Kilimanjaro Safaris',
'Maharajah Jungle Trek',
"Na'vi River Journey",
'The Oasis Exhibits',
'Pangani Forest Exploration Trail',
'Tree of Life',
'TriceraTop Spin',
'UP! A Great Bird Adventure',
'Wild Africa Trek',
'Wilderness Explorers',
```

```
                'Wildlife Express Train',
                'Festival of the Lion King']
```

```
                'Wildlife Express Train',
                'Festival of the Lion King']
```

```
In [181]: balance_partitions(wdw, 3)
```

```
Out[181]:  [["A Pirate's Adventure ~ Treasures of the Seven Seas",
             'Advanced Training Lab',
             'Affection Section',
             'Alien Swirling Saucers',
             'American Heritage Gallery',
             'Astro Orbiter',
             'Avatar\xa0Flight of Passage',
             'Awesome Planet',
             'Beauty and the Beast Live on Stage',
             'Beauty and the Beast: Sing-Along',
             'Big Thunder Mountain Railroad',
             'Bijutsu-kan Gallery',
             "Buzz Lightyear's Space Ranger Spin",
             'Canada: Far and Wide',
             "Casey Jr, Splash 'N' Soak Station",
             'Celebrity Spotlight',
             'Cinderella Castle',
             'Conservation Station',
             'Country Bear Jamboree',
             'Cretaceous Trail',
             'Dino Sue',
             'Dinosaur',
             'Discovery Island\xa0Trails',
             'Disney & Pixar Short Film Festival',
             'Disney Junior Play & Dance!',
             'Dumbo the Flying Elephant',
             'Enchanted Tales with Belle',
             'Enchanted Tiki Room',
             'Expedition Everest: Legend of the Forbidden Mountain',
             'Fantasmic!',
             'Festival of the Lion King',
             'Finding Nemo - The Musical',
             'For the First Time in Forever: A Frozen Sing-Along Celebration',
             'Fossil Fun Games',
             "Frontierland Shootin' Arcade",
             'Frozen Ever After',
             'Gallery of Arts and History',
             'Gran Fiesta Tour Starring The Three Caballeros',
             'Habitat Habit!',
             'Haunted Mansion'],
            ['House of the Whispering Willows',
             'ImageWorks: The What-If Labs',
             'Impressions de France',
             'Indiana Jones Epic Stunt Spectacular!',
             "It's Tough to be a Bug!",
             "It's a Small World",
             'Jedi Training: Trials of the Temple',
             'Journey into Imagination with Figment',
             'Jungle Cruise',
             'Kali River Rapids',
             'Kidcot Fun Stops',
             'Kilimanjaro Safaris',
             'Liberty Square Riverboat',
             "Lightning McQueen's Racing Academy",
             'Living with the Land',
             'Mad Tea Party',
             'Maharajah Jungle Trek',
```

```
                     'Main Street Vehicles\xa0- Themed Area',
                     'Meet and Greet Anna and Elsa from Frozen',
                     'Mexico Folk Art Gallery',
                     'Mickey Short Theater',
                     "Mickey and Minnie's Runaway Railway",
                     "Mickey's PhilharMagic",
                     "Mickey's Royal Friendship Faire stage show",
                     'Millennium Falcon Smugglers Run',
                     'Mission: SPACE',
                     'Monsters, Inc. Laugh Floor',
                     'Muppet*Vision 3D',
                     "Na'vi River Journey",
                     'Pangani Forest Exploration Trail',
                     "Peter Pan's Flight",
                     'Pirates of the Caribbean',
                     'Prince Charming Regal Carrousel',
                     'Project Tomorrow: Inventing the Wonders of the Future',
                     'Reflections of China',
                     'Rise of the Resistance',
                     "Rock 'n' Roller Coaster Starring Aerosmith",
                     'SeaBase'],
                    ['Seven Dwarfs Mine Train',
                     'Slinky Dog Dash',
                     "Soarin'",
                     'Sorcerers of the Magic Kingdom[1]',
                     'Space Mountain',
                     'Spaceship Earth',
                     'Splash Mountain',
                     'Star Tours: The Adventures Continue',
                     'Star Wars Launch Bay',
                     'Star Wars: A Galactic Spectacular',
                     'Stave Church Gallery',
                     'Swiss Family Treehouse',
                     'Test Track',
                     'The American Adventure',
                     'The Barnstormer',
                     'The Boneyard',
                     'The Hall of Presidents',
                     'The Magic Carpets of Aladdin',
                     'The Many Adventures of Winnie the Pooh',
                     'The Oasis Exhibits',
                     'The Seas with Nemo & Friends',
                     'The Twilight Zone Tower of Terror',
                     'Tom Sawyer Island',
                     'Tomorrowland Speedway',
                     'Tomorrowland Transit Authority PeopleMover',
                     'Toy Story Mania!',
                     'Tree of Life',
                     'TriceraTop Spin',
                     'Turtle Talk with Crush',
                     'UP! A Great Bird Adventure',
                     'Under the Sea ~ Journey of The Little Mermaid',
                     'Voyage of the Little Mermaid',
                     'Walt Disney Presents',
                     'Walt Disney World Railroad',
                     "Walt Disney's Carousel of Progress",
                     'Wild Africa Trek',
```

```
                    'Wilderness Explorers',
                    'Wildlife Express Train']]
```

```
In [182]: balance_partitions(wdw, 7)
```

```
Out[182]:  [["A Pirate's Adventure ~ Treasures of the Seven Seas",
             'Advanced Training Lab',
             'Affection Section',
             'Alien Swirling Saucers',
             'American Heritage Gallery',
             'Astro Orbiter',
             'Avatar\xa0Flight of Passage',
             'Awesome Planet',
             'Beauty and the Beast Live on Stage',
             'Beauty and the Beast: Sing-Along',
             'Big Thunder Mountain Railroad',
             'Bijutsu-kan Gallery',
             "Buzz Lightyear's Space Ranger Spin",
             'Canada: Far and Wide',
             "Casey Jr, Splash 'N' Soak Station",
             'Celebrity Spotlight',
             'Cinderella Castle',
             'Conservation Station',
             'Country Bear Jamboree',
             'Cretaceous Trail'],
            ['Dino Sue',
             'Dinosaur',
             'Discovery Island\xa0Trails',
             'Disney & Pixar Short Film Festival',
             'Disney Junior Play & Dance!',
             'Dumbo the Flying Elephant',
             'Enchanted Tales with Belle',
             'Enchanted Tiki Room',
             'Expedition Everest: Legend of the Forbidden Mountain',
             'Fantasmic!',
             'Festival of the Lion King',
             'Finding Nemo - The Musical',
             'For the First Time in Forever: A Frozen Sing-Along Celebration',
             'Fossil Fun Games',
             "Frontierland Shootin' Arcade",
             'Frozen Ever After'],
            ['Gallery of Arts and History',
             'Gran Fiesta Tour Starring The Three Caballeros',
             'Habitat Habit!',
             'Haunted Mansion',
             'House of the Whispering Willows',
             'ImageWorks: The What-If Labs',
             'Impressions de France',
             'Indiana Jones Epic Stunt Spectacular!',
             "It's Tough to be a Bug!",
             "It's a Small World",
             'Jedi Training: Trials of the Temple',
             'Journey into Imagination with Figment',
             'Jungle Cruise',
             'Kali River Rapids',
             'Kidcot Fun Stops',
             'Kilimanjaro Safaris'],
            ['Liberty Square Riverboat',
             "Lightning McQueen's Racing Academy",
             'Living with the Land',
             'Mad Tea Party',
             'Maharajah Jungle Trek',
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        'Main Street Vehicles\xa0- Themed Area',
        'Meet and Greet Anna and Elsa from Frozen',
        'Mexico Folk Art Gallery',
        'Mickey Short Theater',
        "Mickey and Minnie's Runaway Railway",
        "Mickey's PhilharMagic",
        "Mickey's Royal Friendship Faire stage show",
        'Millennium Falcon Smugglers Run',
        'Mission: SPACE',
        'Monsters, Inc. Laugh Floor',
        'Muppet*Vision 3D'],
       ["Na'vi River Journey",
        'Pangani Forest Exploration Trail',
        "Peter Pan's Flight",
        'Pirates of the Caribbean',
        'Prince Charming Regal Carrousel',
        'Project Tomorrow: Inventing the Wonders of the Future',
        'Reflections of China',
        'Rise of the Resistance',
        "Rock 'n' Roller Coaster Starring Aerosmith",
        'SeaBase',
        'Seven Dwarfs Mine Train',
        'Slinky Dog Dash',
        "Soarin'",
        'Sorcerers of the Magic Kingdom[1]',
        'Space Mountain',
        'Spaceship Earth'],
       ['Splash Mountain',
        'Star Tours: The Adventures Continue',
        'Star Wars Launch Bay',
        'Star Wars: A Galactic Spectacular',
        'Stave Church Gallery',
        'Swiss Family Treehouse',
        'Test Track',
        'The American Adventure',
        'The Barnstormer',
        'The Boneyard',
        'The Hall of Presidents',
        'The Magic Carpets of Aladdin',
        'The Many Adventures of Winnie the Pooh',
        'The Oasis Exhibits',
        'The Seas with Nemo & Friends',
        'The Twilight Zone Tower of Terror'],
       ['Tom Sawyer Island',
        'Tomorrowland Speedway',
        'Tomorrowland Transit Authority PeopleMover',
        'Toy Story Mania!',
        'Tree of Life',
        'TriceraTop Spin',
        'Turtle Talk with Crush',
        'UP! A Great Bird Adventure',
        'Under the Sea ~ Journey of The Little Mermaid',
        'Voyage of the Little Mermaid',
        'Walt Disney Presents',
        'Walt Disney World Railroad',
        "Walt Disney's Carousel of Progress",
        'Wild Africa Trek',
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            'Wilderness Explorers',
            'Wildlife Express Train']]
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