

Network Constructor Algorithm

Network Constructor Algorithm

- Phase 1: Creating Schedule Services
 - Generates operational and codeshare schedule services independent of the number of fare types
- Phase 2: Creating Fare Services
 - For each operational and codeshare scheduled service created in Phase 1, creates fare services, using the fare file

Network Constructor Algorithm

- This list describes information needed for phase 1:
 - Input files that the algorithm reads in
 - Patterns that the algorithm regulates
 - Categories that the algorithm assigns to each type and pattern
 - Rules that the algorithm uses to generate patterns
 - Minimum connection time restrictions the algorithm searches for
 - Edits that the algorithm performs
 - Patterns that the algorithm performs
 - Codeshares that the algorithm generates
- Let's do a deeper dive on the above list

Network Constructor Algorithm

- Key Input files that the algorithm reads in phase1 regulate the number of patterns and operations constructed for each market. They include:
 - Values for computing nonstop cutoff and other- than- single plane cutoff
 - Minimum Connect Times
 - List of values for connection generation rules
 - ‘Flags” that indicate whether to perform duplicate or overlapping edits

Network Constructor Algorithm

- Regulating Patterns – uses the following formulas to regulate the number and type or category of patterns generated:
 - **Nonstop Cutoff Level** – the minimum number of Non-Stops to prevent connections
 - **Other-Than-Single-Plane Cutoff Level** – prevents further connection operations of lower priority type

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- Categories Patterns – Assigns each type of pattern to a category which also indicates priority or preference

Pattern Categories Priority

- A: Direct, No stops
- B: Direct, 1 stop
- D: Direct, 2 stops
- G: Direct, > 2 stops
- C: Online connection, 1 stop
- E: Online connection, 2 stops
- H: Online connection, > 2 stops
- F: Interline connection, 1 stop
- I: Interline connection, > 1 stop
- J: Online double connection
- K: Interline double connection
- L : Code Share Categories

Network Constructor Algorithm

- Rules are used to regulate patterns

Rules of Pattern Generation

- Direct, No Stops
 - Reject if TRC allows connect traffic only
- Direct, 1 Stop
 - Reject if TRC allows nonstop or interline connect traffic only
- Online Connection, 1 - Stop
 - Reject if OTSP cutoff level has been satisfied
 - Reject if TRC allows nonstop or interline connect traffic only
 - Reject if minimum or maximum connect times are violated
 - Reject if routing is circuitous
 - Reject if back tracking occurs
 - Reject if more than 2 flight legs are present
 - Reject if segment 1 and segment 2 airlines are not the same
 - Reject if segment 1 and segment 2 have the same flight number
 - Reject if intersecting days of operation are zero

Network Constructor Algorithm

- Meeting Minimum Connection time restrictions
 - Each connecting service must meet the minimum connection time restrictions specified in the MCT file

Network Constructor Algorithm

- Edit process used to cull the number and types of connection operations generated for each market.
 - Duplicate Edit
 - Overlapping Edit

Edit Process

- Duplicate Edit Rules

- Apply to connect services having the same O&D, connect point and the same flight number on segment 1 or segment 2

XXX (Flt 4433) Arv 1215 YYY (Flt 4123) Dep 1300

XXX (Flt 4433) Arv 1215 YYY (Flt 4456) Dep 1400

XXX (Flt 4433) Arv 1215 YYY (Flt 4789) Dep 1500 *Edited out*

- Overlapping Edit Rules

- Applies to connections that depart before and arrive after the direct or connecting flight to which it is compared

Network Constructor Algorithm

- Generating Patterns
 - Approaches pattern generation in the form of iterative passes
 - Generates all possible non-circuitous patterns
 - Uses Market Size file as a filter
 - Relaxes the circuitry restraints so that patterns can be generated for markets with no operations
 - Builds double connections

Network Constructor Algorithm

- Generating Codeshares
 - After creating and editing the operational services, the codeshare generation module is activated

Network Constructor Algorithm

- Phase 2: Creating Fare Services
 - In phase 2, the Network Constructor algorithm builds fare services for each operational and codeshare schedule service created in phase 1
 - Information in the Fare file determines the number and type of fares assigned to each fare service built for a particular schedule service