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Exercise Session: Test Case Design

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Airport Connection Check

- API function to check validity of a connection between two flights.
  - If the arrival airport of Flight A differs from the departure airport of Flight B, connection is invalid.
  - If departure time of Flight B is too close to the arrival time of Flight A, connection is invalid.
  - If an airport doesn't exist, the connection is invalid…

Airport Connection Check

```
validConnection(Flight flightA, Flight flightB)
                    returns ValidityCode
```

A `Flight` is a data structure consisting of:

- A unique identifying flight code
  (string, three characters followed by four numbers).
- The originating airport code (three character string).
- The scheduled departure time from the originating airport
  (in universal time).
- The destination airport code (three character string).
- The scheduled arrival time at the destination airport (in universal time).

Airport Connection Check

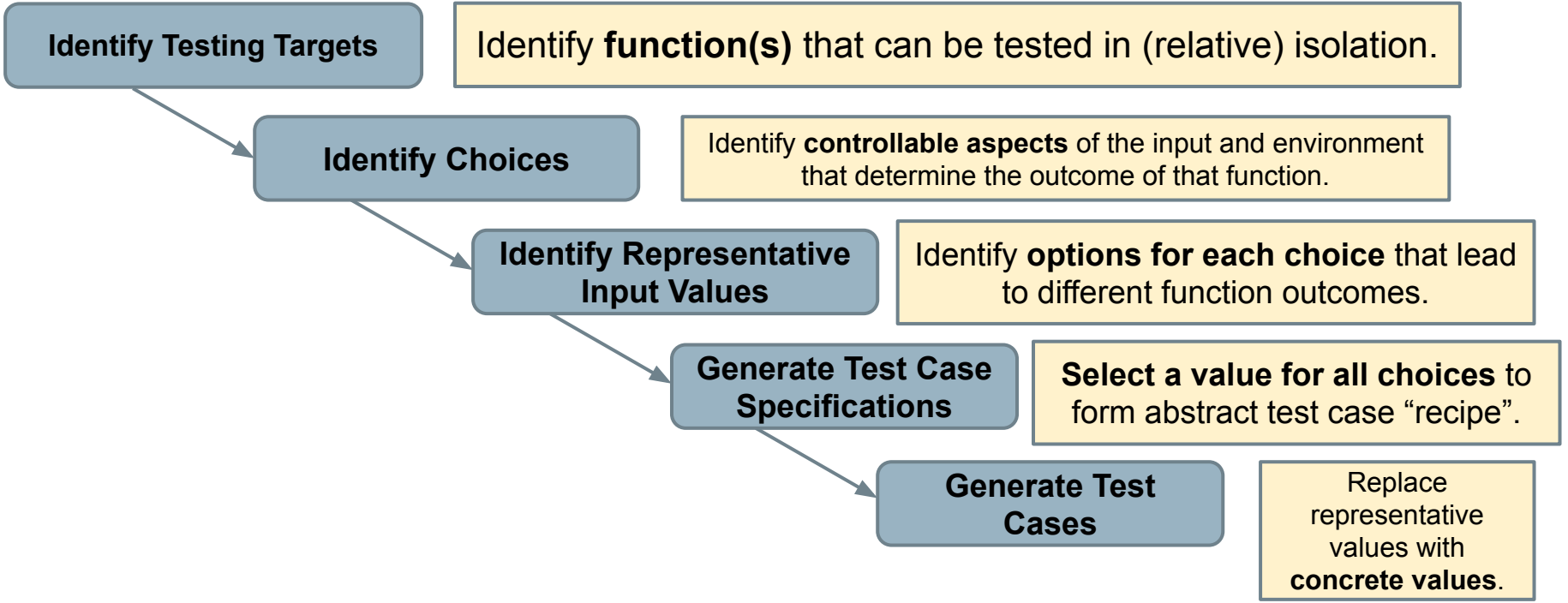
There is also a flight database, where each record contains:

- Three-letter airport code (three character string).
- Airport country (string).
- Minimum domestic connection time
  - (integer, minimum num. minutes that must be allowed for flight connections to be valid).
- Minimum international connection time
  - (more time is required due to need to clear customs and meet regulations)

`ValidityCode` is an integer with value:

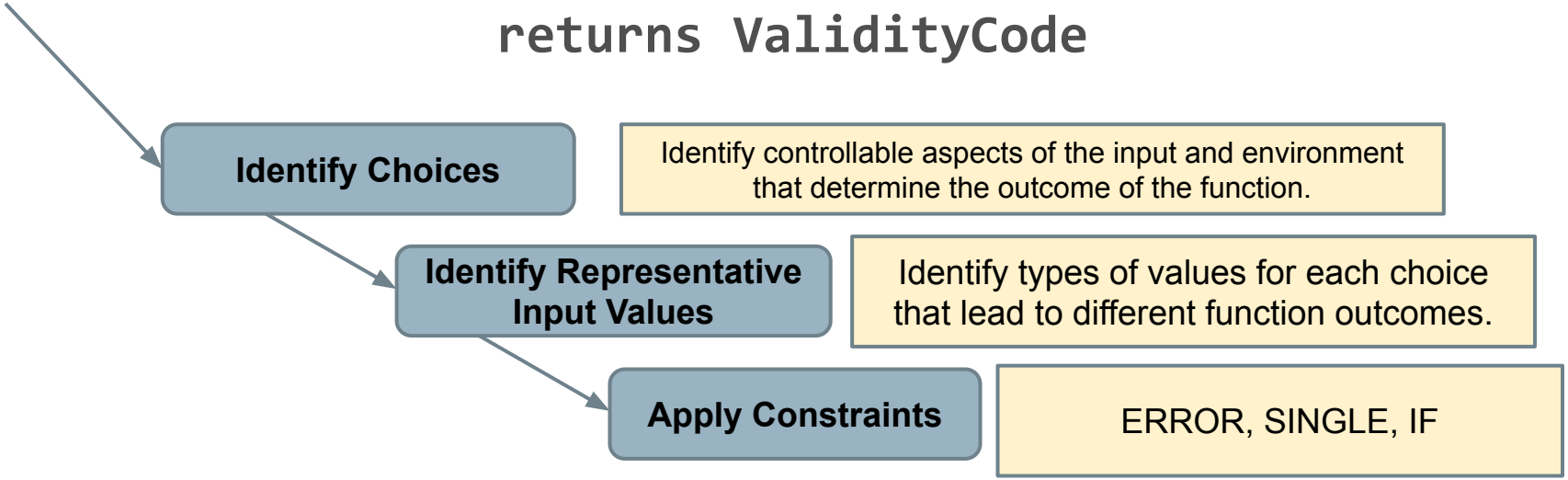
- 0 for OK
- 1 for invalid airport code
- 2 for a connection that is too short
- 3 for flights that do not connect (flightA does not land in same location as flightB)
- 4 for any other errors (malformed input or any other unexpected errors).

Creating Functional Tests



Your Task

```
validConnection(Flight flightA, Flight flightB)
                returns ValidityCode
```



Hints

- Two explicit parameters (Flight A and B) and one implicit (airport database).
  - Flight has multiple fields (potential choices)
  - Database records have multiple fields (potential choices).
  - Remember that representative values can interact. This must be accounted for.
    - **IF constraints indicate when combinations of values should be used for different choices.**

Hints

- Consider how arrival time (flight A), departure time (flight B), and minimum connection time interact.
- Consider that domestic and international connection times can differ in length.
- Consider how the database contents can influence behavior.
- Consider how input can be invalid or malformed
  - (don’t just list “invalid input” but give clear examples).

Example to Start

FlightA

Choice: Originating Airport Code

- Valid airport
- Not in database **[error]**
- Not a correctly formatted airport **[error]**
  - (not a three-letter string)

Partial solution on Canvas

FlightB

Choice: Originating Airport Code

- malformed (not a three-letter string) **[error]**
- not in database **[error]**
- valid code, differs from destination airport of flight a **[error]**
  [if flight a's destination airport code = valid code]
- valid code, same as destination of flight a
  [if flight a's destination airport code = valid code]

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