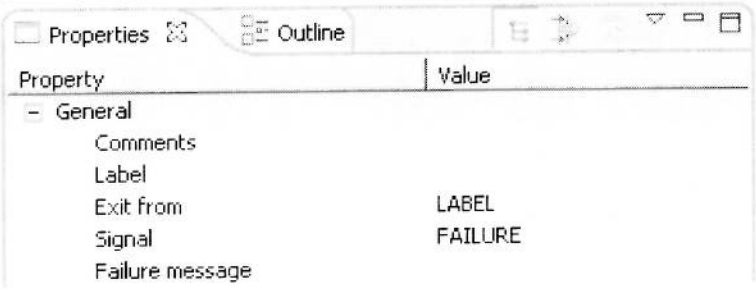
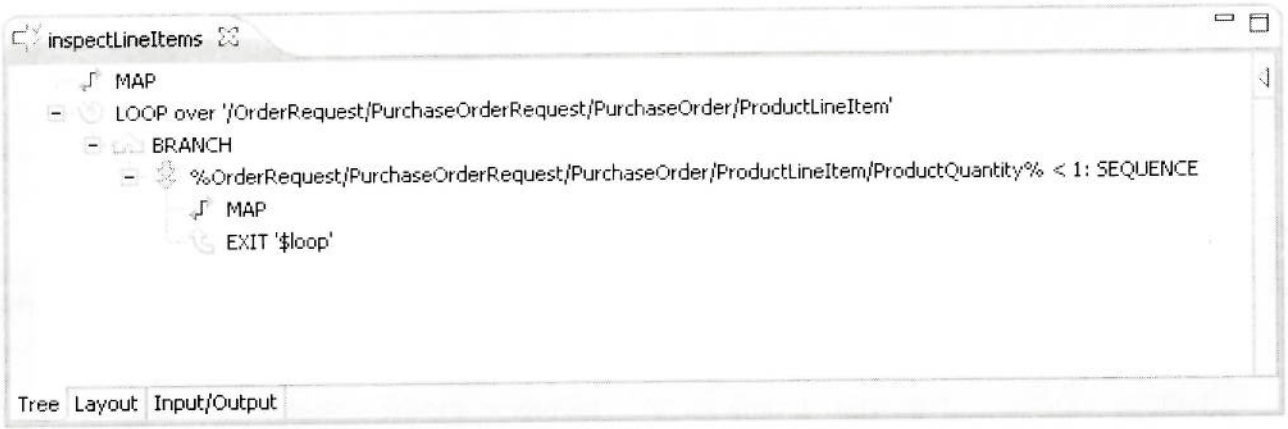


2. What happens if the riskyOperation service works (doesn't fail) ? **Only the 1st and the 2nd SEQUENCE statements get executed. The content of the file is read into memory and is returned to the caller.**

Exercise 8: Validation Service

1. Why did we set isValid to true at the very beginning? **isValid is an Output variable. As such, it should always been initialized.**
2. Is there another way we could have validated this particular value with writing Flow or Java? **We could have written a Java service, but dealing with such nested structures in Java produces deeply nested code that is hard to maintain. When using Flow, we could have used other loop (eg REPEAT) or mapping (eg using Indexes) functionality.**

Extra credit solution:



Exercise 9: Mapping Service

1. How is a transformer different from a normal service? **It requires explicit assignment of its mappings. It does not do implicit mapping. Transformers do not receive a full copy of the pipeline and all transformers in a MAP step can execute in parallel.**
2. What if the transformer you want to use is not in the transformer drop-down list? **You can use any service as transformer by selecting the browse (Browse...) button at the bottom of the transformer dropdown.**
3. Why did we need to LOOP over ProductLineItems? Why not just map from ProductLineItems to Items? **Because we needed to apply transformers to some of the source values. The structure of the two documents is different as well.**

Exercise 10: Create a Java Service

1. What exactly is each line of the Java code doing in the endsWith service? **See the inline comments below:**

```
// get a cursor to access the pipeline

IDataCursor cursor = pipeline.getCursor();

// retrieve the two input values from the pipeline. NOTE: there is
// no test that these values are actually present!

String string = IDataUtil.getString(cursor, "string");
String suffix = IDataUtil.getString(cursor, "suffix");

// compute the value to be returned

String value = string.endsWith(suffix) ? "true" : "false";

// store the return value in the pipeline

IDataUtil.put(cursor, "value", value);

// destroy (release) the cursor, as we do not need it any longer.

cursor.destroy();
```

2. Is the service thread safe? What would you have to do if not? **Yes, it is. Because it's not using any shared state and it's not calling any method that's not thread safe. Otherwise you would have to add the appropriate synchronization primitives to protect such shared state.**
3. How could the cursor handling be improved? **The cursor should be destroyed before we start the computation of the result (The line calling string.endsWith()). To store the results in the pipeline another cursor should be created using the getCursor() method of the pipeline object. The reason for this is, to have the cursors allocated for as short as possible. You should do this whenever you invoke a method that might require some time to compute its result. In the present example the overhead caused by cursor management outweighs the benefits of a shorter cursor lifetime.**

Exercise 11: Monitoring Services

1. Why is it necessary to create remote server aliases? **By design, MWS will communicate only with one instance of Integration server. When resubmitting a service invocation, MWS tells this Integration server where it wants the service instance to be scheduled for execution. To do so, MWS is sending the name of the remote server alias that should be used to resolve the final execution server.**
2. Under what circumstances would it be acceptable to resubmit a service? Why? **Those circumstances depend only on the service execution to be resubmitted. If a failed service had already executed half of its statements, then those statements may have caused some state changes where it may not be viable to do those changes again**

(Imagine a service giving a 3% raise to all employees, that failed after processing the first 100 employees).

Exercise 12: Invoking Services

1. Why and when would you use an HTTP URL alias for your services? You can use an HTTP URL alias if the name of the service, to be called by your clients might change from time to time. It also allows invoking services using a much shorter URL.
2. How do the services find their input data? They all depend on the presence of the node object in the input pipeline. This is a parsed representation of the XML document that was sent to integration server.
3. How do the services return their result? They return their result by XML encoding the content of the output pipeline.

Exercise 13: Create a Flat File Schema

1. Why can't flat files be imported like XML documents? Because a flat file contains no metadata like field names. Also it would be pure guesswork to find the correct delimiter characters.
2. What is the meaning of Nth field? Nth field is the name of an extractor, that returns a part of the data stored in a record, which is delimited by special delimiter characters.

Exercise 14: Create a Flat File Dictionary

1. What is the difference between a dictionary and a schema? A schema describes the records that are contained in a single flat file. A dictionary serves as a repository of record and composite definitions, which can be used across multiple schemas.
2. Why should you create the IS document type when the schema is complete? At this time all information is available to create the IS document type.

Exercise 15: Web Service Descriptors and Custom Faults

1. When would you create a Provider WSD when a Consumer WSD? You create a provider when you (Integration Server) provides a WEB service. You create a consumer WSD when you want to consume external WEB services.
2. How and when are WSC's created? They are implicity created when you create a WEB service consumer or provider.
3. Can you have more than one custom SOAP Fault Document? Yes. All you have to do is the addition of more error document types to the Response/Fault document list of the required operations.

Exercise 16: Broker Pub/Sub

1. What happens when a document is made publishable? The document is modified to contain a new document reference at the top level called _env. This envelope document contains data that is used internally by the broker to process the document. The second thing that happens is the publication of the new document type to the broker.

2. What would be the appropriate production settings for publishable properties **Discard** and **Time to Live** if the Storage type = Guaranteed? **Set discard to false, to the broker will never discard instances of this document. Only set discard to true, if your documents become obsolete after a given amount of time. Put this time amount into the "time to live" field.**
3. What two objects are required for publishing? **The Trigger and a document instance.**
4. What three objects are required for subscribing? **The trigger, the document type and the handling service.**
5. Why were you required to use the full document type name as argument name in the handleValidation Service? **Because this is the name, the broker uses to store the received document in the input pipeline of the handling service.**

Exercise 17: JMS Pub/Sub

1. What is a topic versus a queue? **A topic is a many to many communication, while a queue is a many to one communication channel.**

Exercise 18: Create Adapter Services

1. What administrative activity must be done prior to using adapter service templates? **A JDBC Adapter connection must be created. This object contains all administrative data, like connection information and database credentials, to connect to the database.**
2. Why is it important to specify the LOOP input array before mapping the insertOrderDetails fields? **This step is required to be able to access the individual array elements; one per loop iteration.**

Exercise 19: Adapter Notifications

1. What is automatically created and updated when you work with your notification service? **The database buffer tables storing the notification data**
2. What occurs when the notification schedule is enabled? **The Database trigger becomes enabled and the data corresponding to the notification is collected.**
3. Why is the notification schedule an administration task? **Database-Administrators like to know what happens to their databases and especially want to control repeating operations to their database.**
4. What is the database state a DBA prefers the most? **The database is properly backed up and shut down on a disk that is not mounted on an operating system that is not booted on a computer that is turned off and neither connected to a popwer plug or network cable.**

Exercise 20: Use Services In a Business Process

1. Why do you create swimlanes within a process? What effect do they have on the execution of the process? **Swimlanes are used to group steps, they have no meaning for the execution of the underlying implementation.**
2. What occurs throughout the system when you perform a build and upload from Designer? **It generates Code Fragments and glue logic and stores these in integration server. It also stores information about the process build in the database.**

3. What are the different start mechanisms for a process? **You can wait for a given document to be published (subscription), where you have to option to choose between Broker or JMS, or you can expose your process as a service.**