**Toogood Transform System**

**Detail Design**

**Written By: Eric Ho**

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# **Overview**

## **System Overview**

Toogood Transform System is used for transform input, from multiple different source in different format, to a generic standard output that could be used by other part of the application.

Currently the system only supports 2 different input formats, but developer can easily extend it to support more input source

## **Data Format**

### **Source 1:**

**Identifier**,**Name**,**Type**,**Opened**,**Currency**

123|AbcCode,My Account,2,01-01-2018,CD

**Identifier**

* The identifier column has both a numeric id and an account code, separated by the “|” character
* Need to parse out the account code and output it

**Type**

* 1 = Trading
* 2 = RRSP
* 3 = RESP
* 4 = Fund

**Currency**

* CD = CAD
* US = USD

### **Source 2:**

**Name**,**Type**,**Currency**,**Custodian Code**

My Account,RRSP,C

**Currency**

* C = CAD
* U = USD

**Custodian Code** = Account Code

### **Output:**

**AccountCode**,**Name**,**Type**,**Open Date**,**Currency**

AbcCode,My Account,RRSP,2018-01-01,CAD

**Open Date** is optional field

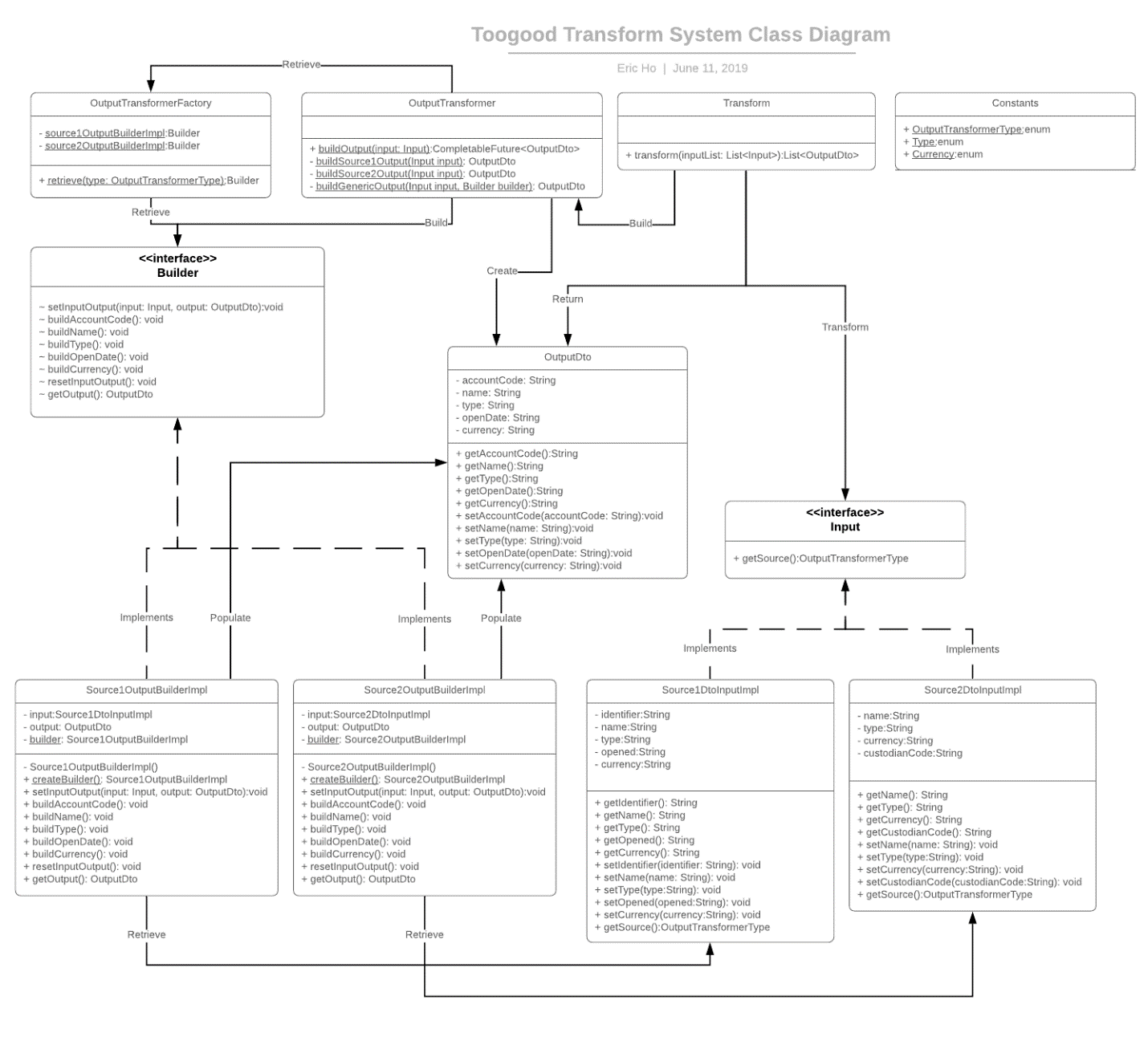
## **Assumption**

1. "Source Account File" means Source 1
2. Source input value as been saved to an object in a separate system
3. Transformed data will only saved to an object and ready to be used by another system, not return in a csv file
4. No validation is required, so any data missing value will still treat as a valid output

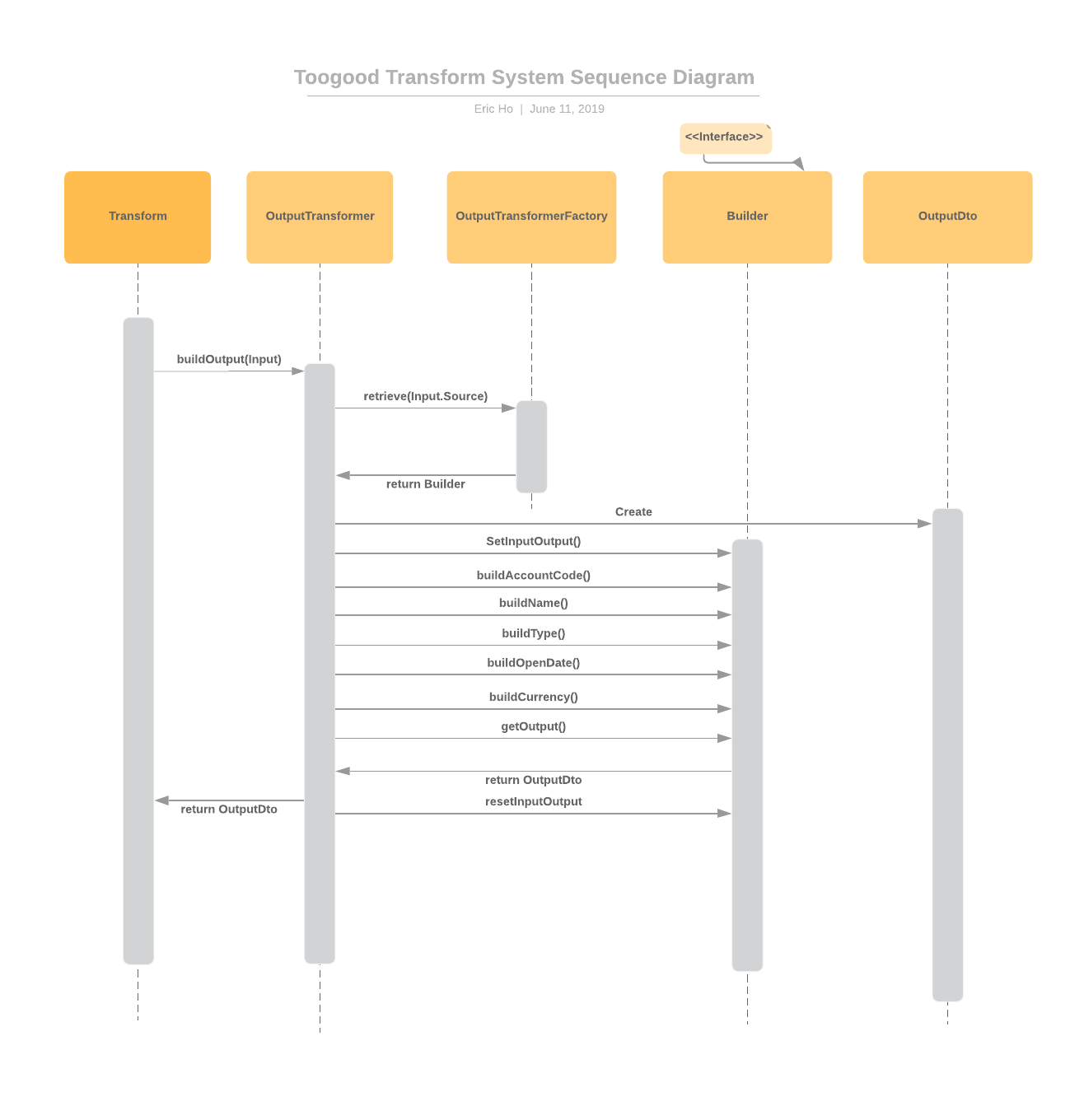
Note: attached the original requirement



# **Class Diagram**



# **Sequence Diagram**



# **Class Definition**

1. **Transform**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform |
| Class Name | Transform |
| Purpose | The main purpose of the class is to transform a list of class implement Input interface and return a list of OutputDto objects for other part of the system to use  Assumption: Data from Source 1 will save to Source1DtoInputImpl, Data from Source 2 will save to Source2DtoInputImpl, etc  To add another Input source, please perform the following   * add a new enum value for Input.OutputTransformerType * add a new Singleton class implementing Input Interface * add a new class implementing Builder Interface * add a new instance value and condition to create new instance of the class in OutputTransformerFactory * add a new condition and private method in OutputTransformer |

* 1. Operations

|  |  |  |
| --- | --- | --- |
| public List<OutputDto> transform(List<Input> inputList) | | |
| Parameters | List<Input> inputList | A list of class implement Input interface needed to be transform |
| Return | List<OutputDto> | A list of OutputDto objects contain the transformed input value |
| Purpose | Transform a list of class implement Input interface and return a list of OutputDto objects for other part of the system to use  By reading CompletableFuture from OutputTransformer, all request is running in asynchronously | |

1. **Builder**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.builder |
| Interface Name | Builder |
| Purpose | In order to use the Builder design pattern, an interface containing all the steps that the implemented class need to implement |

* 1. Operations

|  |  |  |
| --- | --- | --- |
| void setInputOutput(Input input, OutputDto output) | | |
| Parameters | Input input | A class implemented the Input interface to contain the input value |
| Parameters | OutputDto output | A class contain an object for the builder class to update and return with transformed data |
| Purpose | The process to set up the input class and the output class | |

|  |  |
| --- | --- |
| void buildAccountCode() | |
| Purpose | Build the value of Account Code for the OutputDto object |

|  |  |
| --- | --- |
| void buildName() | |
| Purpose | Build the value of Name for the OutputDto object |

|  |  |
| --- | --- |
| void buildType() | |
| Purpose | Build the value of Type for the OutputDto object |

|  |  |
| --- | --- |
| void buildOpenDate() | |
| Purpose | Build the value of Open Date for the OutputDto object |

|  |  |
| --- | --- |
| void buildCurrency() | |
| Purpose | Build the value of Currency for the OutputDto object |

|  |  |
| --- | --- |
| void resetInputOutput() | |
| Purpose | Reset the value of Input object and Output object in the implemented class  As the implemented class is a Singleton class, the object need to be remove after the process so it would not affect the result for the next process |

|  |  |  |
| --- | --- | --- |
| OutputDto getOutput() | | |
| Return | OutputDto | a class contain an object with the transformed data from input value |
| Purpose | Return the transformed class | |

1. **Source1OutputBuilderImpl**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.builder |
| Class Name | Source1OutputBuilderImpl |
| Implements | Builder |
| Purpose | Implementing Builder interface for Builder design pattern  Using Singleton design pattern as only a single object is needed  All method in Builder interface must be implemented for transform input from Source 1 to Output |

* 1. Attributes

|  |  |
| --- | --- |
| private Source1DtoInputImpl input | Input class containing input from Source 1 |
| private OutputDto output | OutputDto class will contain all transformed input value from Input class |
| private static Source1OutputBuilderImpl builder | Private static value for Singleton design pattern |

* 1. Operations

|  |  |
| --- | --- |
| private Source1OutputBuilderImpl() | |
| Purpose | Private constructor for Singleton design pattern |

|  |  |
| --- | --- |
| public static Source1OutputBuilderImpl createBuilder() | |
| Purpose | Create a single copy of the class for Singleton design pattern |

|  |  |  |
| --- | --- | --- |
| public void setInputOutput(Input input, OutputDto output) | | |
| Parameters | Input input | A class implemented the Input interface to contain the input value |
| Parameters | OutputDto output | A class contain an object for the builder class to update and return with transformed data |
| Purpose | Set the value for Input and OutputDto class  Check the instance of the Input class to make sure it is the Input class from Source 1 can be handle by this class | |

|  |  |
| --- | --- |
| public void buildAccountCode() | |
| Purpose | Transform Identifier, input value from Source 1, to OutputDto AccountCode  Split the value of Identifier by '|', and use the right side of the value as AccountCode |

|  |  |
| --- | --- |
| public void buildName() | |
| Purpose | Transform Name, input value from Source 1, to OutputDto Name |

|  |  |
| --- | --- |
| public void buildType() | |
| Purpose | Transform Type, input value from Source 1, to OutputDto Type  Use the input id to find out the value from enum Type in Constants class |

|  |  |
| --- | --- |
| public void buildOpenDate() | |
| Purpose | Transform Opened, input value from Source 1, to OutputDto OpenDate |

|  |  |
| --- | --- |
| public void buildCurrency() | |
| Purpose | Transform Currency, input value from Source 1, to OutputDto Currency  Use the input currency to find out the value from enum Currency in Constants class |

|  |  |
| --- | --- |
| public void resetInputOutput() | |
| Purpose | Reset the value of Inputlist and Output in the implemented class  As the implemented class is a Singleton class, the object need to be remove after the process so it would not affect the result for the next process |

|  |  |  |
| --- | --- | --- |
| public OutputDto getOutput() | | |
| Return | OutputDto | a class contain an object with the transformed data from input value |
| Purpose | Return the transformed OutputDto class | |

1. **Source2OutputBuilderImpl**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.builder |
| Class Name | Source2OutputBuilderImpl |
| Implements | Builder |
| Purpose | Implementing Builder interface for Builder design pattern  Using Singleton design pattern as only a single object is needed  All method in Builder interface must be implemented for transform input from Source 2 to Output |

* 1. Attributes

|  |  |
| --- | --- |
| private Source2DtoInputImpl input | Input class containing input from Source 2 |
| private OutputDto output | OutputDto class will contain all transformed input value from Input class |
| private static Source2OutputBuilderImpl builder | Private static value for Singleton design pattern |

* 1. Operations

|  |  |
| --- | --- |
| private Source2OutputBuilderImpl() | |
| Purpose | Private constructor for Singleton design pattern |

|  |  |
| --- | --- |
| public static Source2OutputBuilderImpl createBuilder() | |
| Purpose | Create a single copy of the class for Singleton design pattern |

|  |  |  |
| --- | --- | --- |
| public void setInputOutput(Input input, OutputDto output) | | |
| Parameters | Input input | A class implemented the Input interface to contain the input value |
| Parameters | OutputDto output | A class contain an object for the builder class to update and return with transformed data |
| Purpose | Set the value for Input and OutputDto class  Check the instance of the Input class to make sure it is the Input class from Source 2 can be handle by this class | |

|  |  |
| --- | --- |
| public void buildAccountCode() | |
| Purpose | Transform CustodianCode, input value from Source 2, to OutputDto AccountCode |

|  |  |
| --- | --- |
| public void buildName() | |
| Purpose | Transform Name, input value from Source 2, to OutputDto Name |

|  |  |
| --- | --- |
| public void buildType() | |
| Purpose | Transform Type, input value from Source 2, to OutputDto Type |

|  |  |
| --- | --- |
| public void buildOpenDate() | |
| Purpose | Not need to implemented because Source 2 input didn't contain open date |

|  |  |
| --- | --- |
| void buildCurrency() | |
| Purpose | Transform Currency, input value from Source 2, to OutputDto Currency  Use the input currency to find out the value from enum Currency in Constants class |

|  |  |
| --- | --- |
| void resetInputOutput() | |
| Purpose | Reset the value of Input object and Output object in the implemented class  As the implemented class is a Singleton class, the object need to be remove after the process so it would not affect the result for the next process |

|  |  |  |
| --- | --- | --- |
| OutputDto getOutput() | | |
| Return | OutputDto | A class contain an object with the transformed data from input value |
| Purpose | Return the transformed OutputDto class | |

1. **Input**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.Input |
| Interface Name | Input |
| Purpose | Interface all input class from different source needed to implement  All implemented class needed to return a type of source in the getSource method |

* 1. Operations

|  |  |  |
| --- | --- | --- |
| public OutputTransformerType getSource() | | |
| Return | OutputTransformerType | A enum Type of the source |
| Purpose | Method to return the source of the implemented class | |

1. **Source1DtoInputImpl**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.input |
| Class Name | Source1DtoInputImpl |
| Implements | Input |
| Purpose | Class implemented Input interface representing the input from Source 1 |

* 1. Attributes

|  |  |
| --- | --- |
| private String identifier | Value from Source 1 |
| private String name | Value from Source 1 |
| private String type | Value from Source 1 |
| private String opened | Value from Source 1 |
| private String currency | Value from Source 1 |

* 1. Operations
* Getter of the attributes
* Setter of the attributes

|  |  |  |
| --- | --- | --- |
| public OutputTransformerType getSource() | | |
| Return | OutputTransformerType | A enum Type of the source |
| Purpose | Return the enum value to identify where Source 1 is the source of input for this class | |

1. **Source2DtoInputImpl**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.input |
| Class Name | Source2DtoInputImpl |
| Implements | Input |
| Purpose | Class implemented Input interface representing the input from Source 2 |

* 1. Attributes

|  |  |
| --- | --- |
| private String name | Value from Source 2 |
| private String type | Value from Source 2 |
| private String currency | Value from Source 2 |
| private String custodianCode | Value from Source 2 |

* 1. Operations
* Getter of the attributes
* Setter of the attributes

|  |  |  |
| --- | --- | --- |
| public OutputTransformerType getSource() | | |
| Return | OutputTransformerType | A enum Type of the source |
| Purpose | Return the enum value to identify where Source 2 is the source of input for this class | |

1. **OutputDto**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.output |
| Class Name | OutputDto |
| Purpose | OutputDto contain all generic value that would be used by other part of the system  All input classes needed to transform their data to the data in this class |

* 1. Attributes

|  |  |
| --- | --- |
| private String accountCode | Value for output |
| private String name | Value for output |
| private String type | Value for output |
| private String openDate | Value for output |
| private String currency | Value for output |

* 1. Operations
* Getter of the attributes
* Setter of the attributes

|  |  |  |
| --- | --- | --- |
| public String toString() | | |
| Return | String | A string contain the output of toString() |
| Purpose | Override the toString() method to display output | |

1. **OutputTransformer**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.transformer |
| Class Name | OutputTransformer |
| Purpose | This is the class to specify how to use the Builder to transform the input data to output |

* 1. Operations

|  |  |  |
| --- | --- | --- |
| public static CompletableFuture<OutputDto> buildOutput(Input input) | | |
| Parameters | Input input | A class implemented the Input interface to contain the input value |
| Return | CompletableFuture<OutputDto> | A class contain an object for the builder class to update and return with transformed data |
| Purpose | Main method to transform the class implemented the Input interface to OutputDto based on the builder returned from OutputTransformerFactory | |

|  |  |  |
| --- | --- | --- |
| private static OutputDto buildSource1Output(Input input) | | |
| Parameters | Input input | A class implemented the Input interface to contain the input value |
| Return | OutputDto | A class contain an object for the builder class to update and return with transformed data |
| Purpose | Using the Singleton builder for Source 1 input to build the output  Use synchronized to make sure it is a thread-safe method as static object will be used | |

|  |  |  |
| --- | --- | --- |
| private static OutputDto buildSource2Output(Input input) | | |
| Parameters | Input input | A class implemented the Input interface to contain the input value |
| Return | OutputDto | A class contain an object for the builder class to update and return with transformed data |
| Purpose | Using the Singleton builder for Source 2 input to build the output  Use synchronized to make sure it is a thread-safe method as static object will be used | |

|  |  |  |
| --- | --- | --- |
| private static OutputDto buildGenericOutput(Input input, Builder builder) | | |
| Parameters | Input input | A class implemented the Input interface to contain the input value |
| Parameters | Builder builder | A builder class for specific source |
| Return | OutputDto | A class contain an object for the builder class to update and return with transformed data |
| Purpose | Perform a generic way to transform input to ouput regardless which builder object is in used | |

1. **OutputTransformerFactory**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.transformer |
| Class Name | OutputTransformerFactory |
| Purpose | Use Factory design pattern to return a builder class based on the enum Type in the Input Interface |

* 1. Attributes

|  |  |
| --- | --- |
| private static Builder source1OutputBuilderImpl | Builder implemented class for Source 1 |
| private static Builder source2OutputBuilderImpl | Builder implemented class for Source 2 |

* 1. Operations

|  |  |  |
| --- | --- | --- |
| public static Builder retrieve(OutputTransformerType type) | | |
| Parameters | OutputTransformerType type | A type of source input from enum OutputTransformerType in constants |
| Return | Builder | A builder object based on the source input |
| Purpose | Return a class implemented Builder Interface based on the enum Type in the Input Interface | |

1. **Constants**
   1. Details

|  |  |
| --- | --- |
| Package | com.toogood.data.transform.util |
| Class Name | Constants |
| Purpose | To store constant value |

* 1. Attributes

|  |  |
| --- | --- |
| public static enum OutputTransformerType | Enum containing all different kind of input source |
| public static enum Type | Enum type for identify the Output Type value from the input value |
| public static enum Currency | Enum type for identify the Output Currency value from the input value |