# Instructions for Challenge #2

As we learned from the module on inheritance and polymorphism, a super class should contain all the instance variables that are common to all subclasses. The subclasses inherit the superclass variables and methods, and can have additional variables & methods, and can override methods from the superclass. A superclass can also implement an interface, which forces it to code specific methods.

**Overview of Project**Find the zipped Netbeans project on Canvas, which contains a skeleton of the driver and **domain** classes, **GrandparentTradition,** **ParentTradition** and **ChildrenTradition.** See the UML diagram below for the details of each class. The **driver** class will do 3 main tasks:

1. Read a text file & create the appropriate object for each record, depending on the record type
2. Add each object to a single arrayList that can hold all 3 types of objects (grandparent, parent, and child objects)
3. Once the arrayList is fully populated, process each object by calling its polymorphic methods to:
   1. Display how each object celebrates the holidays
   2. Tabulates & displays the costs of the celebrations.

Diagram

Description automatically generated

Domain Classes:  
Carefully look at the superclass called **GrandparentsTradition** which implements the interface called *Celebratable*. Then, define all of its subclasses ***making sure to reference the superclass methods where appropriate (e.g. constructor, toString, and tabulateCosts ).***

* Define the appropriate instance variables in each of the subclasses (see UML diagram).
* Define the appropriate constructor in each of the subclasses, taking advantage of inheritance.
* Define the getters & setters in each of the subclasses.
* Define the **tabulateCosts()** and the **celebrate()** polymorphic methods in each of the subclasses. Be sure to reference superclass versions of the tabulateCosts() method:
  + Costs at the Grandparent level are just an estimate of 10 x the cost per serving
  + Costs at the Parent level are the same as the costs at the Grandparent level plus the costs of the drinks and desserts per guest that the parents invited
  + Costs at the Children level are the same as the costs at the Parent level plus the costs of the movie rental.
* Define the **toString()** method of each subclass, making sure to also reference the superclass .toString().
* See the examples of the output in the last couple of pages in this document.

**Driver Class:**In the **main method** you must define the arrayList that will be returned from the createTraditions() method. Then, you must pass that arrayList as an argumen to the celebrateHolidays() method.

? = **createTraditions();** **celebrateHolidays**(?);

In the **createTraditions()** method you must finish the code to:

1. Add the arrayList as a return type to the method and return it at the end of the method.
2. Within a loop read each field in each record & depending on the first letter in the record, create a Grandparent, Parent, or Children object.
3. Within the same loop add each object created to an arrayList. Be sure to carefully the select the data type of the arrayList to be able to hold all 3 types of classes.
4. Once the entire file has been read, close it.

In the **celebrateHolidays()** method you must:

1. Add the arrayList as a parameter to the method.
2. Write a loop that will iterate through the entire arrayList
   1. Within the loop, call the polymorphic methods that will cause each object to display how they celebrate the holidays and what is the cost of doing so.

Note: For all classes, cost of meal is fixed for 10 people. Cost of dessert &drinks are additional for parents (per invited guest), and for children get the cost of 1 movie added.

The **toString()** method should follow the **formats** below for each class:

For **GrandparentTradition** objects:

We grandparents like to celebrate the holidays like \_\_\_\_\_\_\_ during the \_\_\_\_\_\_ holiday season at the \_\_\_\_\_.

We eat \_\_\_\_\_ as the main dish, with \_\_ side dishes.

We like to eat in the \_\_\_\_\_.

The food is from a \_\_\_\_ source.

The cost per serving is about \_\_\_\_

For a typical gathering of 10, we will spend \_\_\_\_

For **ParentTradition** objects:

We parents like to celebrate the holidays like \_\_\_\_\_\_ during the \_\_\_\_ holiday season at the \_\_\_\_.

We eat \_\_\_\_\_ as the main dish, with \_\_ side dishes.

We like to eat in the \_\_\_\_\_.

The food is from a \_\_\_\_\_ source.

The cost per serving is about \_\_\_

We ALSO like to invite at least \_\_ friends over to our house after our meal to eat \_\_\_\_\_ for dessert, and drink \_\_\_\_\_.

We pay \_\_\_\_ for each dessert, and \_\_\_\_ for each drink.

For a typical gathering of 10, we will spend \_\_\_ plus the costs of desserts & drinks per guest: \_\_\_\_

For **ChildrenTradition** objects:

We children like to celebrate the holidays like \_\_\_\_ during the \_\_\_\_ holiday season at the \_\_\_\_.

We eat \_\_\_ as the main dish, with \_\_ side dishes.

We like to eat in the \_\_\_.

The food is from a \_\_\_ source.

The cost per serving is about \_\_\_

We ALSO like to invite at least \_\_ friends over to our house after our meal to eat \_\_\_\_\_ for dessert, and drink \_\_\_\_.

We pay \_\_\_ for each dessert, and \_\_\_\_ for each drink.

AND, before and after our meal we like to play \_\_\_\_\_.

We also like watching holiday movies like \_\_\_\_\_\_\_ which usually cost about \_\_\_\_\_

At bedtime, we like to read holiday stories like \_\_\_\_\_\_\_\_\_.

For a typical gathering of 10, we will spend \_\_\_\_ plus the costs of desserts & drinks per guest: \_\_\_\_ plus the cost of a movie: \_\_\_\_

Given the following records in the **input** text file for the project:

g Thanksgiving Autumn 6:00pm turkey 8 dining\_room 20.00 home-cooked   
g Christmas Winter 1:00pm pork 6 outdoor\_patio 30.00 catered  
g Easter Spring 3:00pm ham 7 dining\_room 25.00 pot\_luck  
g Fourth\_of\_July Summer 1:00pm ribs 5 picnic 15.00 barbeque  
p Thanksgiving Autumn 7:00pm chicken 6 outdoor\_patio 20.00 home-cooked 12 pumpkin\_pie apple\_cider 3.00 4.00  
p Christmas Winter 5:00pm ham 10 dining\_room 35.00 home-cooked 10 flan egg\_nog 3.25 1.95  
p Easter Spring 6:00pm mac-n-cheese 4 dining\_room 20.00 pot\_luck 8 carrot\_cake orange\_juice 3.25 2.50  
p Fourth\_of\_July Summer 11:00am sandwiches 3 picnic 15.00 catered 15 apple\_pie lemonade 3.50 1.50  
c Thanksgiving Autumn 5:00pm ham 10 living\_room 17.00 pot\_luck 25 pecan\_pie wine 5.00 6.00 Checkers Pilgrims\_in\_America Coming\_to\_America 3.25  
c Christmas Winter 3:00pm turkey 8 dining\_room 28.00 catered 12 peppermint\_ice\_cream champagne 4.25 6.50 Chess Twas\_the\_Night\_Before\_Christmas It's\_a\_Wonderful\_Life 3.00  
c Easter Spring 4:00pm lamb 6 dining\_room 32.00 home-cooked 10 egg\_custard tomato\_juice 4.25 1.50 Easter\_Egg\_Hunt Peter\_Rabbit The\_Greatest\_Story\_Ever\_Told 4.50  
c Fourth\_of\_July Summer 10:00am pancakes 3 outdoor\_patio 12.00 home-cooked 12 peaches mimosa 2.50 7.50 volleyball An\_American\_Tail Independence\_Day 3.75

The following is the **output** of the project:

We grandparents like to celebrate the holidays like Thanksgiving during the Autumn holiday season at the 6:00pm. We eat turkey as the main dish, with 8 side dishes.  
We like to eat in the dining\_room.   
The food is from a home-cooked source.   
The cost per serving is about $20.00  
For a typical gathering of 10, we will spend 200.00

We grandparents like to celebrate the holidays like Christmas during the Winter holiday season at the 1:00pm.   
We eat pork as the main dish, with 6 side dishes.  
We like to eat in the outdoor\_patio.   
The food is from a catered source.   
The cost per serving is about $30.00  
For a typical gathering of 10, we will spend 300.00

We grandparents like to celebrate the holidays like Easter during the Spring holiday season at the 3:00pm.   
We eat ham as the main dish, with 7 side dishes.  
We like to eat in the dining\_room.   
The food is from a pot\_luck source.   
The cost per serving is about $25.00  
For a typical gathering of 10, we will spend 250.00

We grandparents like to celebrate the holidays like Fourth\_of\_July during the Summer holiday season at the 1:00pm.   
We eat ribs as the main dish, with 5 side dishes.  
We like to eat in the picnic.   
The food is from a barbeque source.   
The cost per serving is about $15.00  
For a typical gathering of 10, we will spend 150.00

We parents like to celebrate the holidays like Thanksgiving during the Autumn holiday season at the 7:00pm.   
We eat chicken as the main dish, with 6 side dishes.  
We like to eat in the outdoor\_patio.   
The food is from a home-cooked source.   
The cost per serving is about $20.00  
We ALSO like to invite at least 12 friends over to our house after our meal to eat pumpkin\_pie for dessert, and drink apple\_cider.  
We pay $3.00 for each dessert, and 4.00 for each drink.   
For a typical gathering of 10, we will spend 200.00 plus the costs of desserts & drinks per guest: $84.00

We parents like to celebrate the holidays like Christmas during the Winter holiday season at the 5:00pm.   
We eat ham as the main dish, with 10 side dishes.  
We like to eat in the dining\_room.   
The food is from a home-cooked source.   
The cost per serving is about $35.00  
We ALSO like to invite at least 10 friends over to our house after our meal to eat flan for dessert, and drink egg\_nog.  
We pay $3.25 for each dessert, and 1.95 for each drink.   
For a typical gathering of 10, we will spend 350.00 plus the costs of desserts & drinks per guest: $52.00  
  
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We parents like to celebrate the holidays like Easter during the Spring holiday season at the 6:00pm.   
We eat mac-n-cheese as the main dish, with 4 side dishes.  
We like to eat in the dining\_room.   
The food is from a pot\_luck source.   
The cost per serving is about $20.00  
We ALSO like to invite at least 8 friends over to our house after our meal to eat carrot\_cake for dessert, and drink orange\_juice.  
We pay $3.25 for each dessert, and 2.50 for each drink.   
For a typical gathering of 10, we will spend 200.00 plus the costs of desserts & drinks per guest: $46.00

We parents like to celebrate the holidays like Fourth\_of\_July during the Summer holiday season at the 11:00am.   
We eat sandwiches as the main dish, with 3 side dishes.  
We like to eat in the picnic.   
The food is from a catered source.   
The cost per serving is about $15.00  
We ALSO like to invite at least 15 friends over to our house after our meal to eat apple\_pie for dessert, and drink lemonade.  
We pay $3.50 for each dessert, and 1.50 for each drink.   
For a typical gathering of 10, we will spend 150.00 plus the costs of desserts & drinks per guest: $75.00

We children like to celebrate the holidays like Thanksgiving during the Autumn holiday season at the 5:00pm.   
We eat ham as the main dish, with 10 side dishes.  
We like to eat in the living\_room.   
The food is from a pot\_luck source.   
The cost per serving is about $17.00  
We ALSO like to invite at least 25 friends over to our house after our meal to eat pecan\_pie for dessert, and drink wine.  
We pay $5.00 for each dessert, and 6.00 for each drink.   
AND, before and after our meal we like to play Checkers.  
We also like watching holiday movies like Coming\_to\_America which usually cost about $3.25.  
At bedtime, we like to read holiday stories like Pilgrims\_in\_America.   
For a typical gathering of 10, we will spend 170.00 plus the costs of desserts & drinks per guest: $275.00 plus the cost of a movie: $3.25

We children like to celebrate the holidays like Christmas during the Winter holiday season at the 3:00pm.   
We eat turkey as the main dish, with 8 side dishes.  
We like to eat in the dining\_room.   
The food is from a catered source.   
The cost per serving is about $28.00  
We ALSO like to invite at least 12 friends over to our house after our meal to eat peppermint\_ice\_cream for dessert, and drink champagne.  
We pay $4.25 for each dessert, and 6.50 for each drink.   
AND, before and after our meal we like to play Chess.  
We also like watching holiday movies like It's\_a\_Wonderful\_Life which usually cost about $3.00.  
At bedtime, we like to read holiday stories like Twas\_the\_Night\_Before\_Christmas.   
For a typical gathering of 10, we will spend 280.00 plus the costs of desserts & drinks per guest: $129.00 plus the cost of a movie: $3.00

We children like to celebrate the holidays like Easter during the Spring holiday season at the 4:00pm.   
We eat lamb as the main dish, with 6 side dishes.  
We like to eat in the dining\_room.   
The food is from a home-cooked source.   
The cost per serving is about $32.00  
We ALSO like to invite at least 10 friends over to our house after our meal to eat egg\_custard for dessert, and drink tomato\_juice.  
We pay $4.25 for each dessert, and 1.50 for each drink.   
AND, before and after our meal we like to play Easter\_Egg\_Hunt.  
We also like watching holiday movies like The\_Greatest\_Story\_Ever\_Told which usually cost about $4.50.  
At bedtime, we like to read holiday stories like Peter\_Rabbit.   
For a typical gathering of 10, we will spend 320.00 plus the costs of desserts & drinks per guest: $57.50 plus the cost of a movie: $4.50

We children like to celebrate the holidays like Fourth\_of\_July during the Summer holiday season at the 10:00am.   
We eat pancakes as the main dish, with 3 side dishes.  
We like to eat in the outdoor\_patio.   
The food is from a home-cooked source.   
The cost per serving is about $12.00  
We ALSO like to invite at least 12 friends over to our house after our meal to eat peaches for dessert, and drink mimosa.  
We pay $2.50 for each dessert, and 7.50 for each drink.   
AND, before and after our meal we like to play volleyball.  
We also like watching holiday movies like Independence\_Day which usually cost about $3.75.  
At bedtime, we like to read holiday stories like An\_American\_Tail.   
For a typical gathering of 10, we will spend 120.00 plus the costs of desserts & drinks per guest: $120.00 plus the cost of a movie: $3.75