CAB302 Assignment 2: Inventory Management Application Report
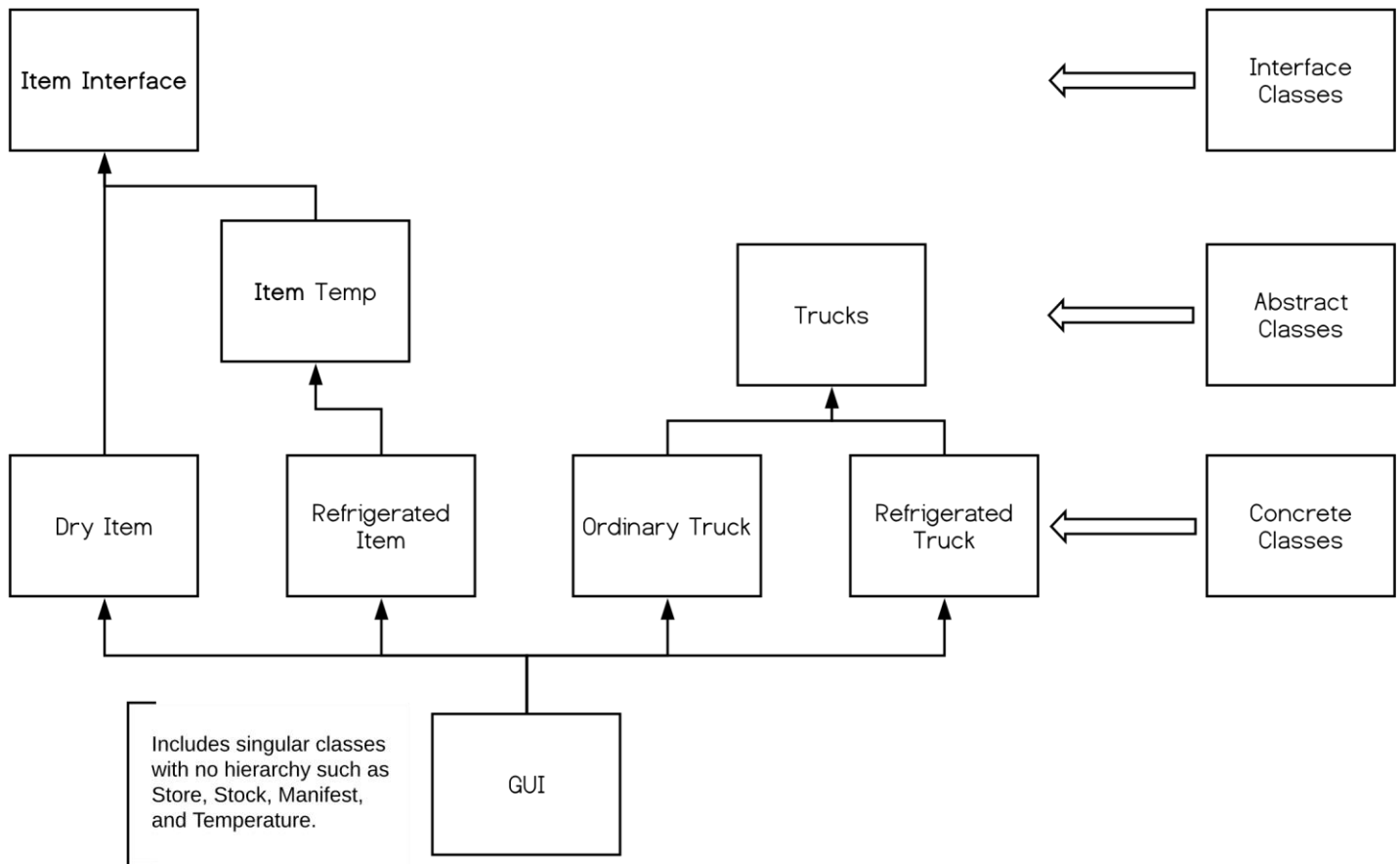
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Diagram:

Polymorphism

In Java's Object-Oriented Programming, objects are written in separate classes therefore the main program needs a way to refer to those classes, polymorphism is commonly used in that area. When a parent/superclass is used to refer to a child/class object polymorphism is achieved. All of superclasses and subclasses use polymorphism as there are only one way to access a referenced declared variable. Once an item is declared the reference is created then the users can use the methods within that reference/item.

Classes & Interaction

Interface Class

Item Interface determines each item/object's characteristics and behaviour, similar to creating a blueprint in terms of building architecture. It is the layout that the object takes. In this case, Item Interface gives Dry Item and Refrigerated Item classes name, cost, price, reorder point and reorder amount. This is because both Item classes must have those characteristics for the Store to function appropriately.

Interfaces can contain constants which we are not currently using as each item have different characteristic values. Interfaces cannot be instantiated but they are implemented into other classes.

Abstract Classes & Abstraction

This type of class tends to be more general/less specific than concrete classes since it is further up on the hierarchy, hence that interfaces cannot be instantiated. *Abstraction* is implemented for hiding the implementation from the user, it can be seen what the object does but not how it does it.

Item Temp can give its subclasses the behaviour to have a temperature, while Trucks can also be inherited for the subclasses to have a temperature it includes a quantity to determine a refrigerated trucks quantity with that temperature.

The temperature in the Item Temp is used accordingly with the refrigerated truck. Since each Refrigerated Item has a required temperature, the refrigerated truck dispatched will be based on that temperature so that all the items within the cargo does not spoil.

Concrete Classes

Concrete classes are at the end of the hierarchy as they contain the constructors that initializes that specific item.

Our concrete classes:

- Dry Item
- Refrigerated Item
- Ordinary Truck
- Refrigerated Truck
- Stock
- Store
- Manifest

These classes have a constructor that creates an object that has the attributes passed within the parameter. They all interact with each other using the setters and getters within the classes. For example, an item "rice" in Stock have a quantity of "10" in Store and if we had to check the reorder point to restock, then we would look at the item "rice" individually by accessing it using the getter in Dry Item class, likewise for the refrigerated item. If "rice" is due for reordering, then a Manifest is created which determines the items needed to be reordered and which Trucks are needed to be dispatched. When the items are bought from the distribution centre, the Store then restocks those items and updates the Store's capital and Stock accordingly. Each class is needed for the entire program to work hence that referencing/polymorphism plays a big role in the project as the objects in an OOP based program it is the only way to access an object's attributes.

GUI Test Report:

SCREEN 1 - Initial Page – GENERATE MANIFEST button is disabled before items are initiated
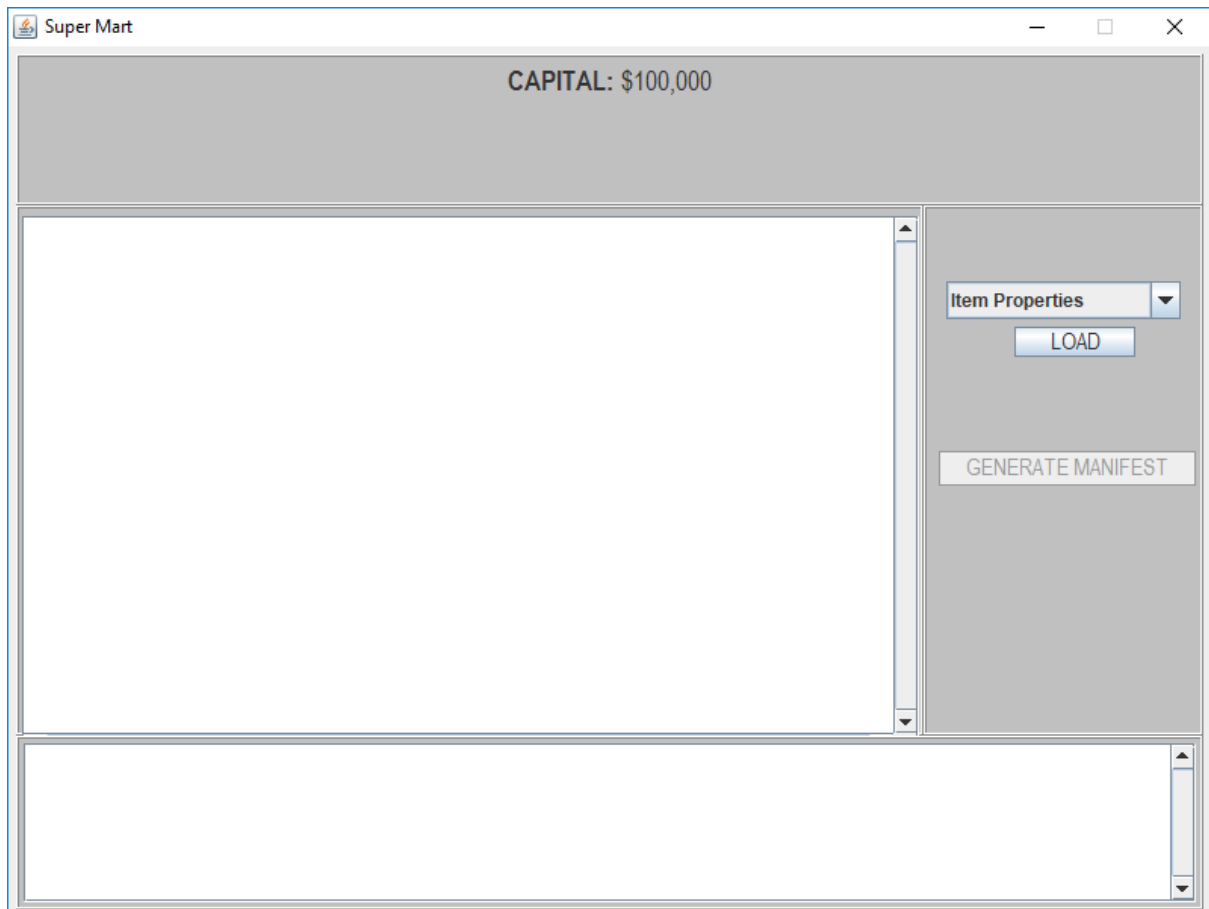
SCREEN 2 – After loading item properties – GENERATE MANIFEST enabled, inventory table is shown, and a console-like output showing the processed data.

Super Mart							— □ ✕

CAPITAL: $100,000

Name	Cost	Price	Reorder Point	Reorder Am...	Temperature	Quantity	
rice	2	3	225	300		0	
beans	4	6	450	525		0	
pasta	3	4	125	250		0	
biscuits	2	5	450	575		0	
nuts	5	9	125	250		0	
chips	2	4	125	200		0	
chocolate	5	8	250	375		0	
bread	2	3	125	200		0	
mushrooms	2	4	200	325	10	0	
tomatoes	1	2	325	400	10	0	
lettuce	1	2	250	350	10	0	
grapes	4	6	125	225	9	0	
asparagus	2	4	175	275	8	0	
celery	2	3	225	350	8	0	
chicken	10	14	325	425	4	0	
beef	12	17	425	550	3	0	
fish	13	16	375	475	2	0	
yoghurt	10	12	200	325	3	0	
milk	2	3	300	425	3	0	

Item Properties ▼

LOAD

GENERATE MANIFEST

[Item Name: milk][Item Cost: 2][Item Price: 3][Item Reorder Point: 300][Item Reorder Amount: 425][Item Temperature: 3]
[Item Name: cheese][Item Cost: 4][Item Price: 7][Item Reorder Point: 375][Item Reorder Amount: 450][Item Temperature: 3]
[Item Name: ice cream][Item Cost: 8][Item Price: 14][Item Reorder Point: 175][Item Reorder Amount: 250][Item Temperature: -20]
[Item Name: ice][Item Cost: 2][Item Price: 5][Item Reorder Point: 225][Item Reorder Amount: 325][Item Temperature: -10]
[Item Name: frozen meat][Item Cost: 10][Item Price: 14][Item Reorder Point: 450][Item Reorder Amount: 575][Item Temperature: -14]
[Item Name: frozen vegetable mix][Item Cost: 5][Item Price: 8][Item Reorder Point: 225][Item Reorder Amount: 325][Item Temperature: -12]

SCREEN 3 – Item properties already loaded error

Super Mart

CAPITAL: $100,000

Name	Cost	Price	Reorder Point	Reorder Am...	Temperature	Quantity
rice	2	3	225	300		0
beans	4	6	450	525		0
pasta	3	4	125	250		0
biscuits	2	5	450	575		0
nuts	5	9	125	250		0
chips	2	4	125	200		0
chocolate	5	8	250	375		0
bread	2	3	125	200		0
mushrooms	2	4	200	325	10	0
tomatoes	1	2	325	400	10	0
lettuce	1	2	250	350	10	0
grapes	4	6	125	225	9	0
asparagus	2	4	175	275	8	0
celery	2	3	225	350	8	0
chicken	10	14	325	425	4	0
beef	12	17	425	550	3	0
fish	13	16	375	475	2	0
yoghurt	10	12	200	325	3	0
milk	2	3	300	425	3	0

Item Properties ▼

LOAD

GENERATE MANIFEST

NOTE: Item Properties already loaded, no action taken

SCREEN 4 – GENERATE MANIFEST button clicked outputs a string in console "Manifest Generated"

Name	Cost	Price	Reorder Point	Reorder Am...	Temperature	Quantity
rice	2	3	225	300		0
beans	4	6	450	525		0
pasta	3	4	125	250		0
biscuits	2	5	450	575		0
nuts	5	9	125	250		0
chips	2	4	125	200		0
chocolate	5	8	250	375		0
bread	2	3	125	200		0
mushrooms	2	4	200	325	10	0
tomatoes	1	2	325	400	10	0
lettuce	1	2	250	350	10	0
grapes	4	6	125	225	9	0
asparagus	2	4	175	275	8	0
celery	2	3	225	350	8	0
chicken	10	14	325	425	4	0
beef	12	17	425	550	3	0
fish	13	16	375	475	2	0
yoghurt	10	12	200	325	3	0
milk	2	3	300	425	3	0

CAPITAL: $100,000

Super Mart

Item Properties

LOAD

GENERATE MANIFEST

Manifest Generated

SCREEN 5 – Load Manifest – Updates each item quantity correctly, however the cost taken from capital has inaccuracies. Console outputs of the manifest results.

Super Mart

CAPITAL: $35,936.11

Name	Cost	Price	Reorder Point	Reorder Am...	Temperature	Quantity
rice	2	3	225	300		300
beans	4	6	450	525		525
pasta	3	4	125	250		250
biscuits	2	5	450	575		575
nuts	5	9	125	250		250
chips	2	4	125	200		200
chocolate	5	8	250	375		375
bread	2	3	125	200		200
mushrooms	2	4	200	325	10	325
tomatoes	1	2	325	400	10	400
lettuce	1	2	250	350	10	350
grapes	4	6	125	225	9	225
asparagus	2	4	175	275	8	275
celery	2	3	225	350	8	350
chicken	10	14	325	425	4	425
beef	12	17	425	550	3	550
fish	13	16	375	475	2	475
yoghurt	10	12	200	325	3	325
milk	2	3	300	425	3	425

Manifest ▼

LOAD

GENERATE MANIFEST

Manifest Loaded
Total Items Cost: 64063.89
Capital: 35936.11
biscuits=575,
bread=200,
chicken=425,

SCREEN 6 – Load Sales log 0 – shows the income and current capital in the console and also updates the inventory table.

Name	Cost	Price	Reorder Point	Reorder Am...	Temperature	Quantity
biscuits	2	5	450	575		181
nuts	5	9	125	250		214
chips	2	4	125	200		156
chocolate	5	8	250	375		282
bread	2	3	125	200		105
mushrooms	2	4	200	325	10	149
tomatoes	1	2	325	400	10	236
lettuce	1	2	250	350	10	198
grapes	4	6	125	225	9	110
asparagus	2	4	175	275	8	157
celery	2	3	225	350	8	266
chicken	10	14	325	425	4	286
beef	12	17	425	550	3	355
fish	13	16	375	475	2	107
yoghurt	10	12	200	325	3	274
milk	2	3	300	425	3	312
cheese	4	7	375	450	3	101
ice cream	8	14	175	250	-20	162
ice	2	5	225	325	-10	249
frozen meat	10	14	450	575	-14	355

CAPITAL: $65,266.11

Sales Log 0

LOAD

GENERATE MANIFEST

Sales Log 0 Loaded.
Total Income: 29330.0
Capital: 65266.11
Map: [biscuits=181, bread=105, chicken=286, chips=156, frozen meat=355, milk=312, beef=355, ice=249, frozen vegetable mix=216, rice=2

SCREEN 7 – Final Inventory and Capital – After all the whole process of generating manifest, loading manifest and loading sales log. The final stock is correctly updated but the capital still has inaccuracies.

Super Mart — □ ✕

CAPITAL: $21,630.91

Name	Cost	Price	Reorder Point	Reorder Am...	Temperature	Quantity
rice	2	3	225	300		386
beans	4	6	450	525		805
pasta	3	4	125	250		343
biscuits	2	5	450	575		853
nuts	5	9	125	250		357
chips	2	4	125	200		145
chocolate	5	8	250	375		540
bread	2	3	125	200		182
mushrooms	2	4	200	325	10	225
tomatoes	1	2	325	400	10	574
lettuce	1	2	250	350	10	430
grapes	4	6	125	225	9	198
asparagus	2	4	175	275	8	253
celery	2	3	225	350	8	263
chicken	10	14	325	425	4	571
beef	12	17	425	550	3	701
fish	13	16	375	475	2	734
yoghurt	10	12	200	325	3	338
milk	2	3	300	425	3	549

Manifest ▼

LOAD

GENERATE MANIFEST

Manifest Loaded
Total Items Cost: 40363.20
Capital: 21630.91
biscuits=853,
bread=182,
chicken=571,

SCREEN 8 – Stock Exception – When loading a manifest and the store's capital is insufficient, an error in the console appears to inform the client.

Name	Cost	Price	Reorder Point	Reorder Am...	Temperature	Quantity
rice	2	3	225	300		386
beans	4	6	450	525		805
pasta	3	4	125	250		343
biscuits	2	5	450	575		853
nuts	5	9	125	250		357
chips	2	4	125	200		145
chocolate	5	8	250	375		540
bread	2	3	125	200		182
mushrooms	2	4	200	325	10	225
tomatoes	1	2	325	400	10	574
lettuce	1	2	250	350	10	430
grapes	4	6	125	225	9	198
asparagus	2	4	175	275	8	253
celery	2	3	225	350	8	263
chicken	10	14	325	425	4	571
beef	12	17	425	550	3	701
fish	13	16	375	475	2	734
yoghurt	10	12	200	325	3	338
milk	2	3	300	425	3	549

CAPITAL: $21,630.91

Manifest

LOAD

GENERATE MANIFEST

Insufficient capital funds: Items not purchased