

CS401 Final Project - Coupon Inventory System

Name: Sharanheer Choudhari
Seat Number: A20398615

Project Report

(a) Project Managing Schedule

- The project involve different development stages including problem analysis, requirement gathering, designing, implementation, testing and debugging.
- Below is the daily progress report including the estimated time in hours and the description of task performed at each stage of the software development life cycle.

Daily Progress Report

Date	Day	Estimated hrs	Task performed	Status
11/08/2017	Wednesday	2h	Analyzing the problem and requirements	Completed
11/09/2017	Thursday	3h	Software specification -Flow diagram and UML	Completed
11/10/2017	Friday	2h	Designing algorithm for input functionality	Completed
11/11/2017	Saturday	3h	Designing algorithm for search functionality	Completed
11/12/2017	Sunday	4h	Designing algorithm for list functionality	Completed
11/13/2017	Monday	2h	Coding - implemented the input functionality	Completed
11/14/2017	Tuesday	2h	Coding - Implemented the search functionality	Completed
11/15/2017	Wednesday	3h	Coding - Implemented the list functionality	Completed
11/16/2017	Thursday	5h	Coding - GUI building and merging all the functions	Completed
11/17/2017	Friday	5h	Testing & Debugging	Completed
11/18/2017	Saturday	4h	Documentation	Completed
	Total	1d 11h		

(b) Problem Specification

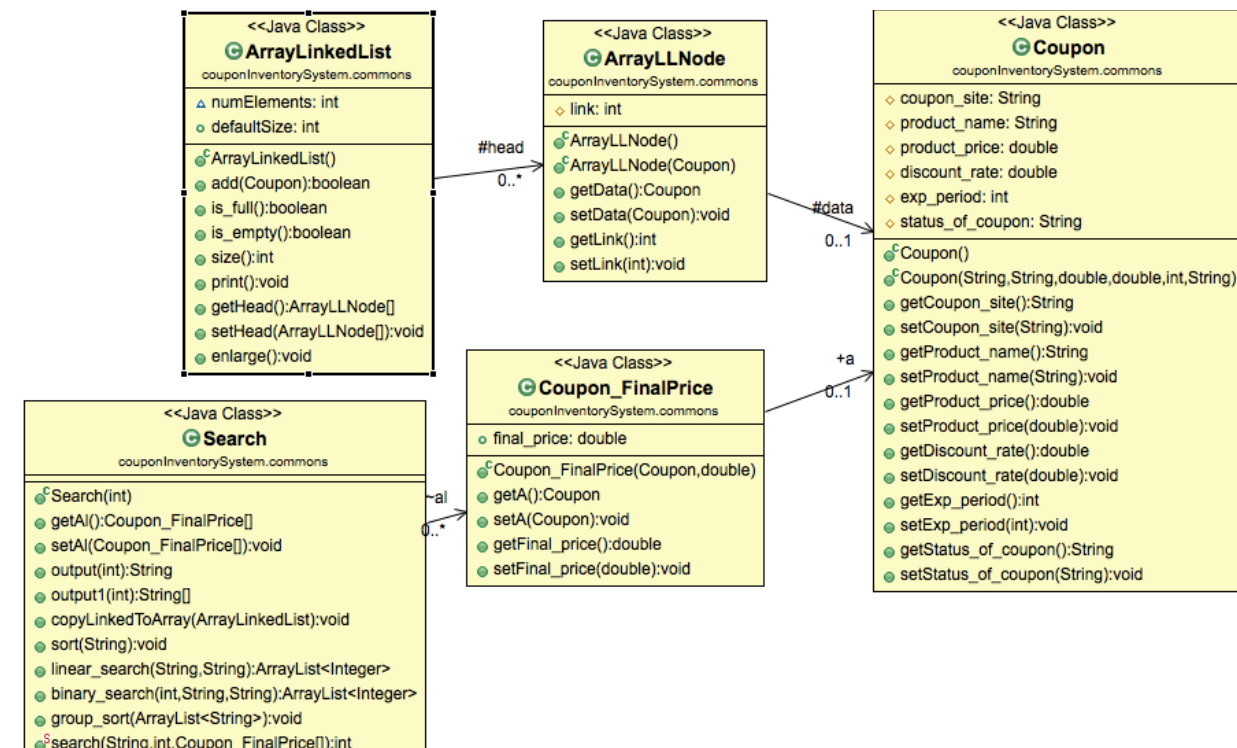
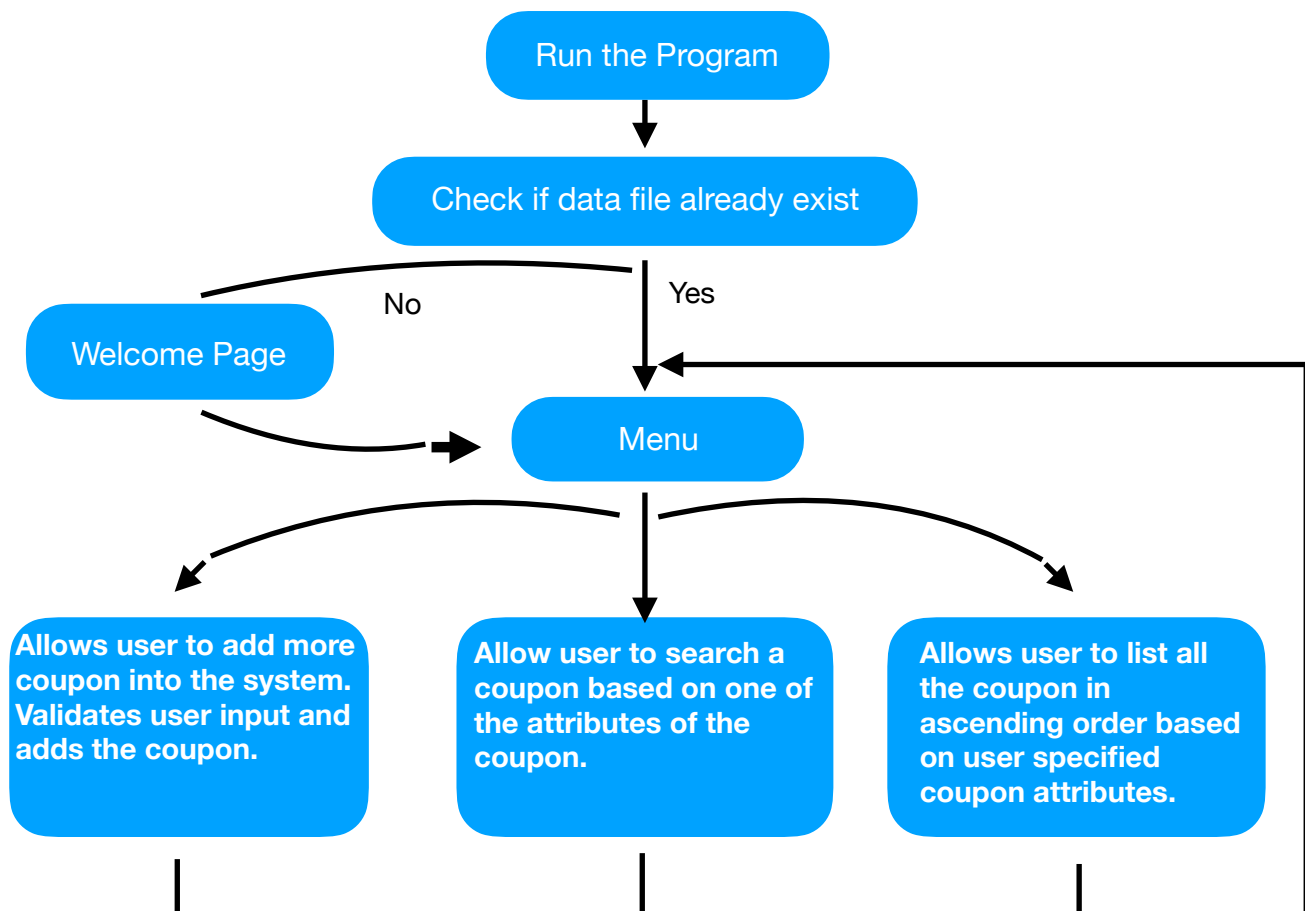
- Managing, storing and searching large number of coupons becomes a very difficult task. Using the coupon inventory system (CIS) it enable user to easily organize coupons in a very efficient way.
- Validate user input to make sure correct information is provided by the user for the system to perform all the task without any errors.
- Solves the problem of searching a coupon by providing a very systematic way of searching any coupon from the coupon database.
- Helps in giving flexibility to search for a coupon based on one of the attributes of the coupon such as coupon provider name, product name, original price, discount rate, expiration period and status of the coupon.
- Designing an algorithm to sort the coupons based on multiple attributes and list them in the ascending order.
- Design algorithms which is efficient in terms of computation time and takes less memory space.
- Building a user-friendly interface which is easy to understand and is fun to use.
- Implement and write code which is easy to understand and modify for future improvements.
- Make sure the software handle any run-time exceptions allowing software to run smoothly and coherently.

(c) Software Specification

The Coupon Inventory System (CIS) consist of three main functions

1. User Input:
 - Input to the software can be provided either by providing a data file or through manually.
 - Initially when the CIS is used for the first time it ask the user to select a data file from the local drive, which is used as a database for storing all the coupons and creates a linked list for future processing
 - Once entering the coupons through the file, it allows user to input more coupons manually by clicking the add coupons button.
 - The coupons will be saved to the database file and will also be added to the linked list.
2. Searching Coupon:
 - It allows user to search for coupons based on one of the coupon attributes such as Coupon provider name, Product name, etc.
 - It first creates a sorted list using the main linked list. It then uses two algorithms, linear search and binary search to search coupons.
 - Once the coupon is found it provides how many searches it took using linear and binary search and also gives the coupon in a tabular format.
 - If there is not coupon found based on the user input, it will give a message saying “No element found” and gives number of comparisons performed by both the algorithms.
3. Listing Coupons:
 - It gives a list of all the coupons stored in the database in ascending order of the attributes of the coupon.
 - It asks user to choose the attributes on which they need to sort and prints all the coupons in the specified order.
 - This allows user to sort and make decision how they can make efficient use of the coupons. Eg: Sorting coupons based on the final price and using the information obtained from the list function to make a decision about which is the cheapest deal possible.

(d) Design Diagram and UML



(e) Operational Document

- Run the program.
- Welcome screen appears asking user to browse the file from the local drive.
- Once the file is selected, a menu screen appears using which user can select below function.

Adding Coupon

- On clicking this button, user can choose to add more coupons to the coupon database.
- All the fields for a coupon must be entered before adding coupon to the system otherwise a error message will popup.
- Once all the field are entered user can select proceed button to store the coupon to the database.
- On clicking cancel, control will return to the menu screen.

Searching Coupon

- On clicking the search, user can select an attribute of the coupon per which it wants to search the coupon from the database.
- Once the attribute is selected, user needs to enter the value its searching for and click proceed. Eg: Provide product name if user wants to search for a coupon based on name.
- If user inputs a valid input, the software will search the coupon and provide all the coupons found to the user.

Listing Coupon

- On selecting this function, user can select the attributes per which the sorting of the coupon list needs to be performed.
- User can maximum choose three attributes per which it needs to sort.
- Once the attributes are chosen, user needs to click proceed.
- A detailed list of all the coupons is provided to the user.

(f) Testing Document

- If the input file is not provided in the below format, the software won't work and will give error.
- For all other cases the software works without any error.

Format:

"CouponProvider<space>ProductName<space>Price<space>Discount Rate<space>
Expiration<space>Status"

```
groupon nike 100.0 10.0 60 Unused  
WorldFree armaniwatc 1000.0 20.0 30 unused
```

Coupon Provider : Must not exceed 10 alphabets and can contain special characters like & and _.

Product Name: Must not exceed 20 alphabets and can contain special characters like & and _.

Discount rate : Must be less than or equal to 100 and greater than 0.

Expiration: Must be greater than zero and should be provided in number of days.

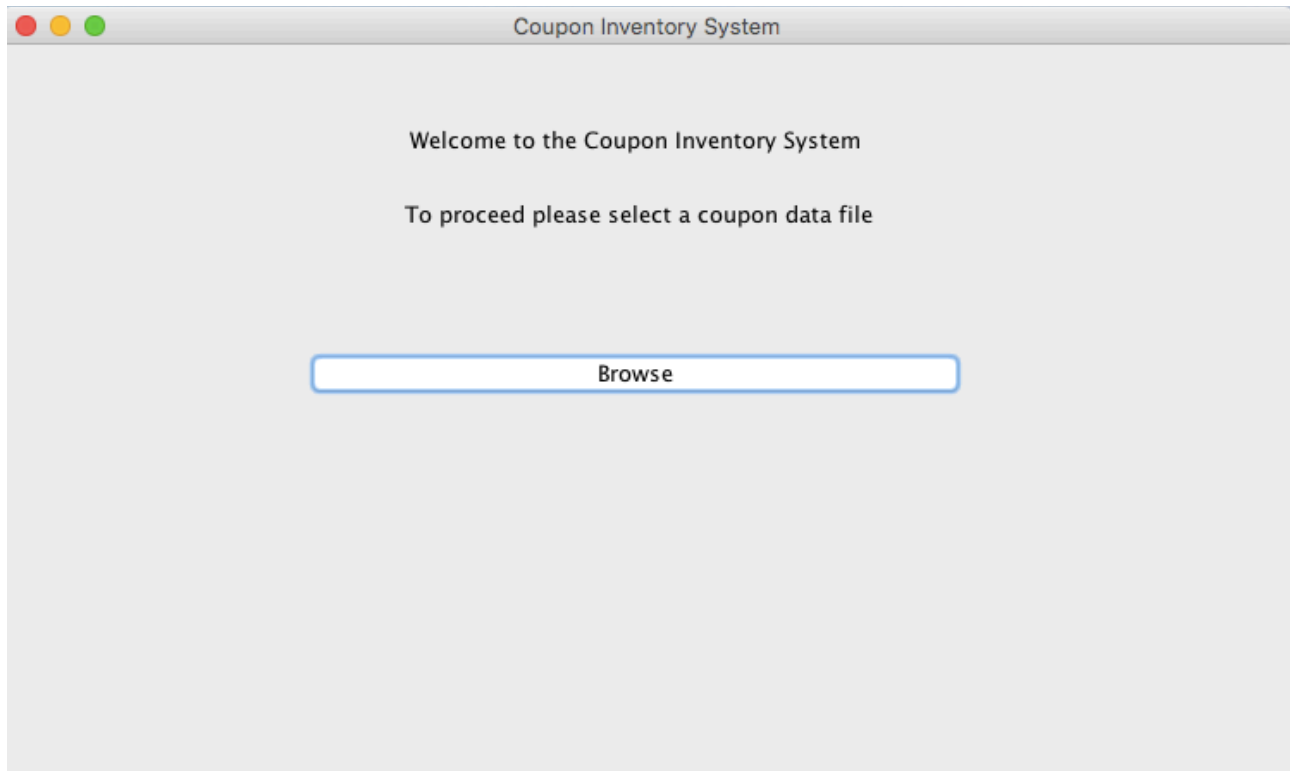
Status: Must contain only 'Unused' or 'Redeemed'.

(g) Future Improvement Document

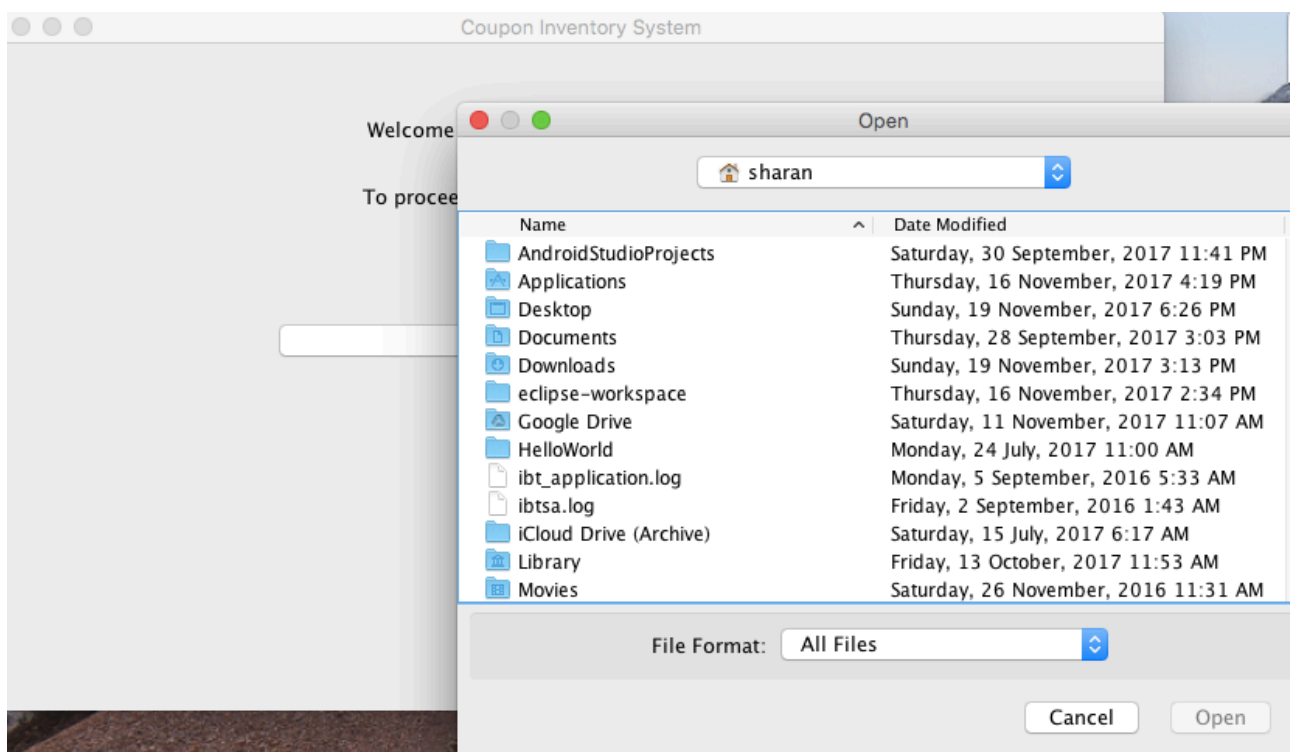
- A feature can be added to the system to restrict the user from adding duplicate coupon.
- A feature can be added to the system to update the status of the coupon from unused to redeemed.
- A feature can be added to the system to remove a coupon from the system if its expired or no longer required by the user.
- A notification feature can be added to the system to notify user if a coupon is about to expire.
- Add a feature to scan the input file for any error before adding it to the coupon database.

(h) Visual Presentation screen shots

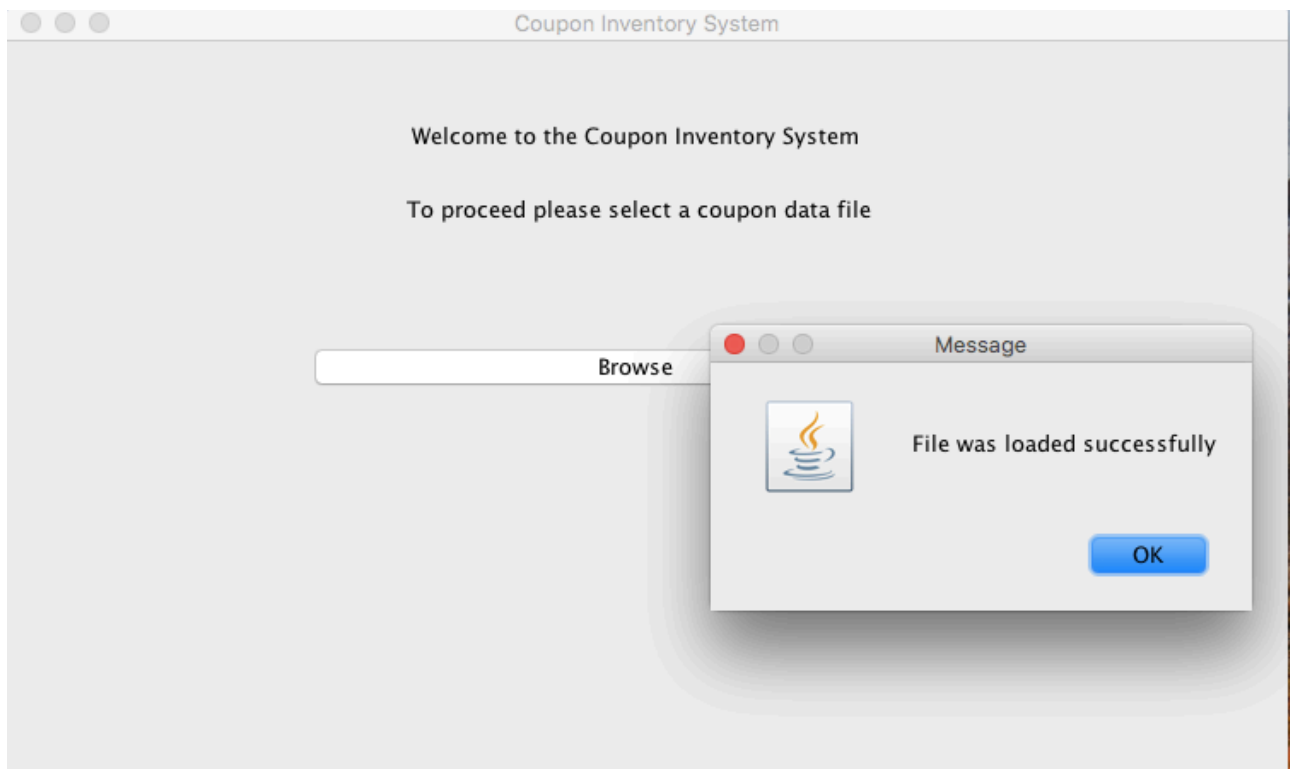
On running the program for the first time, a welcome screen appears as below.



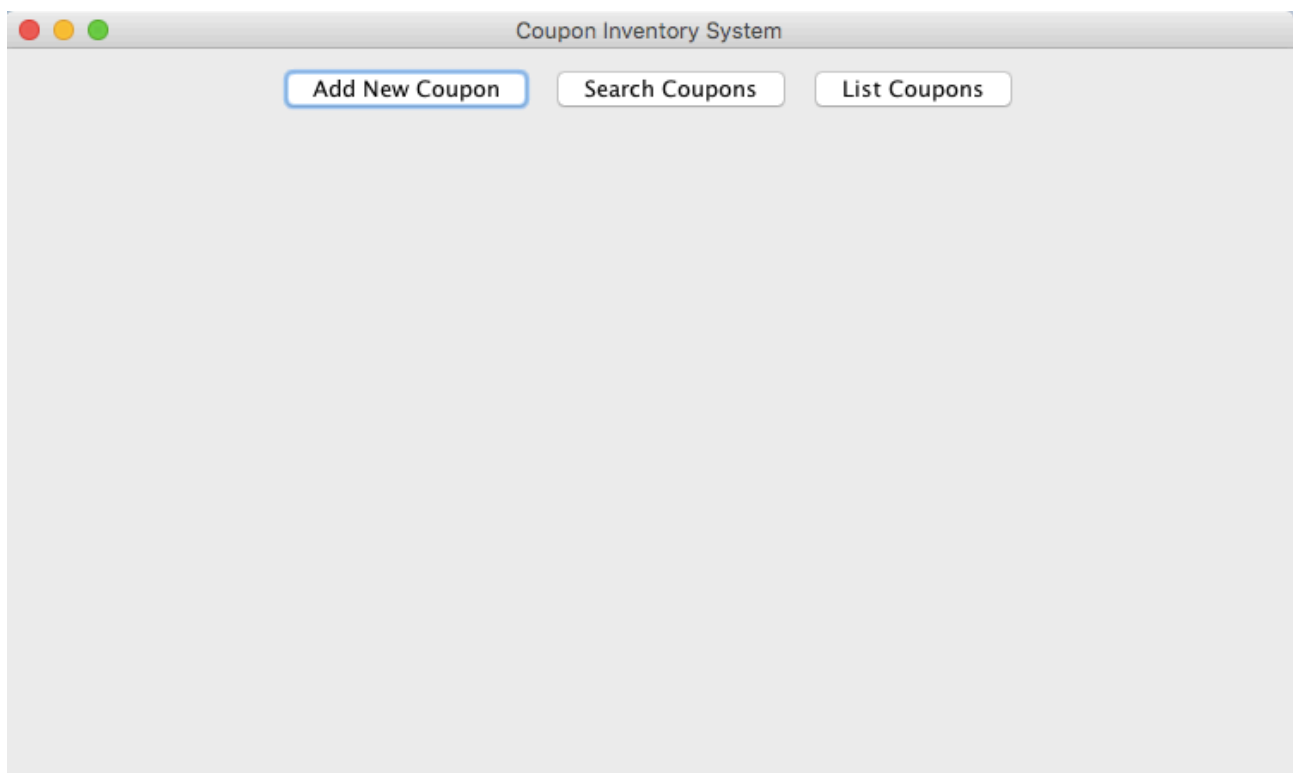
On clicking Browse, it gives user to select the file from the local drive.



On selecting the coupon data file, a confirmation message appears on the screen.



On clicking OK , the coupon is loaded into the database and the Menu screen shows up as below.



User can now select different function like adding new coupon, search coupon or list coupon.

When the user selects add new coupon, below screen shows up.

Coupon Inventory System

Coupon Site : Must be alphabets & limited to 10 char

Product name : Must be alphabets & limited to 20 char

Original Price : Must be a positive value

Discount Rate : Must be a positive value

Expiration Period : Must be number of days between (1-365)

Status of Coupon : ☒ Unused ☐ Redeemed

User can now enter all the details for a coupon and click proceed in order to store the coupon to the database.

Coupon Inventory System

Coupon Site : Must be alphabets & limited to 10 char

Product name : Must be alphabets & limited to 20 char

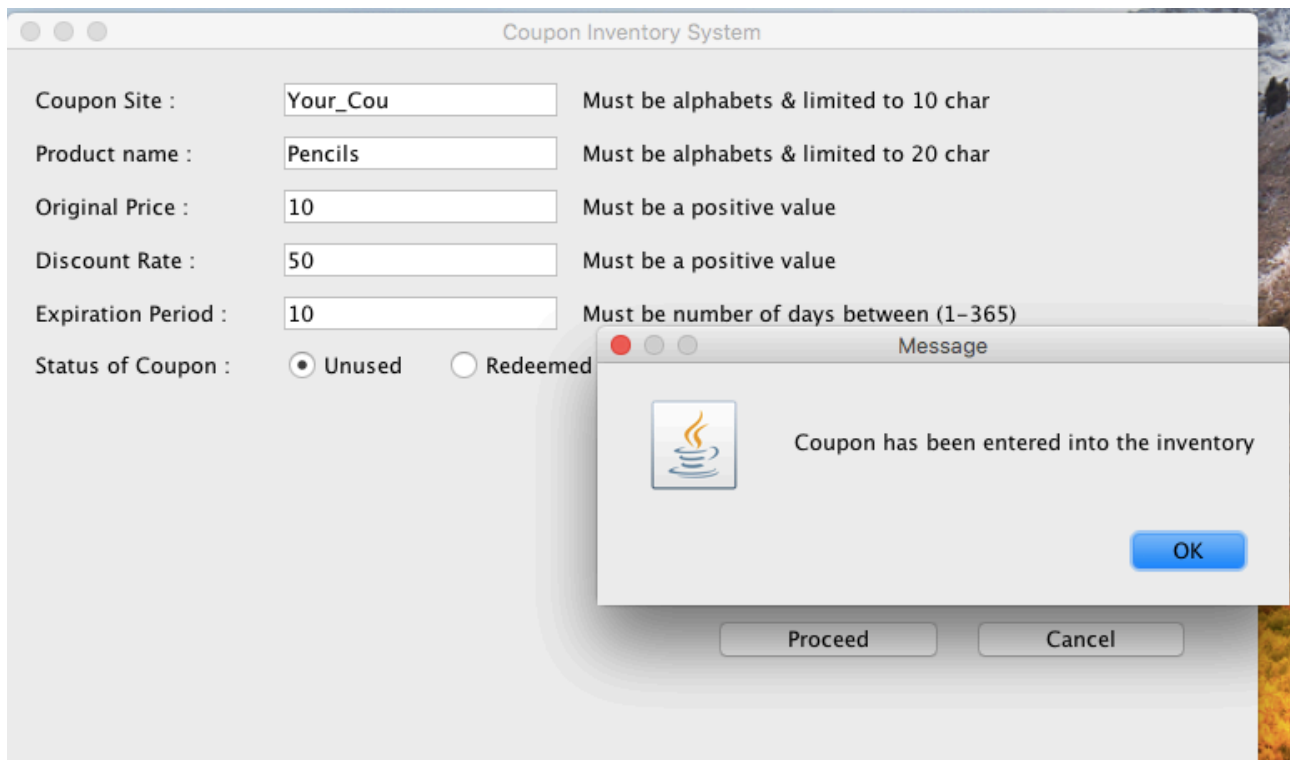
Original Price : Must be a positive value

Discount Rate : Must be a positive value

Expiration Period : Must be number of days between (1-365)

Status of Coupon : ☒ Unused ☐ Redeemed

On clicking the proceed button, a confirmation message pops up if all the requirement is met.

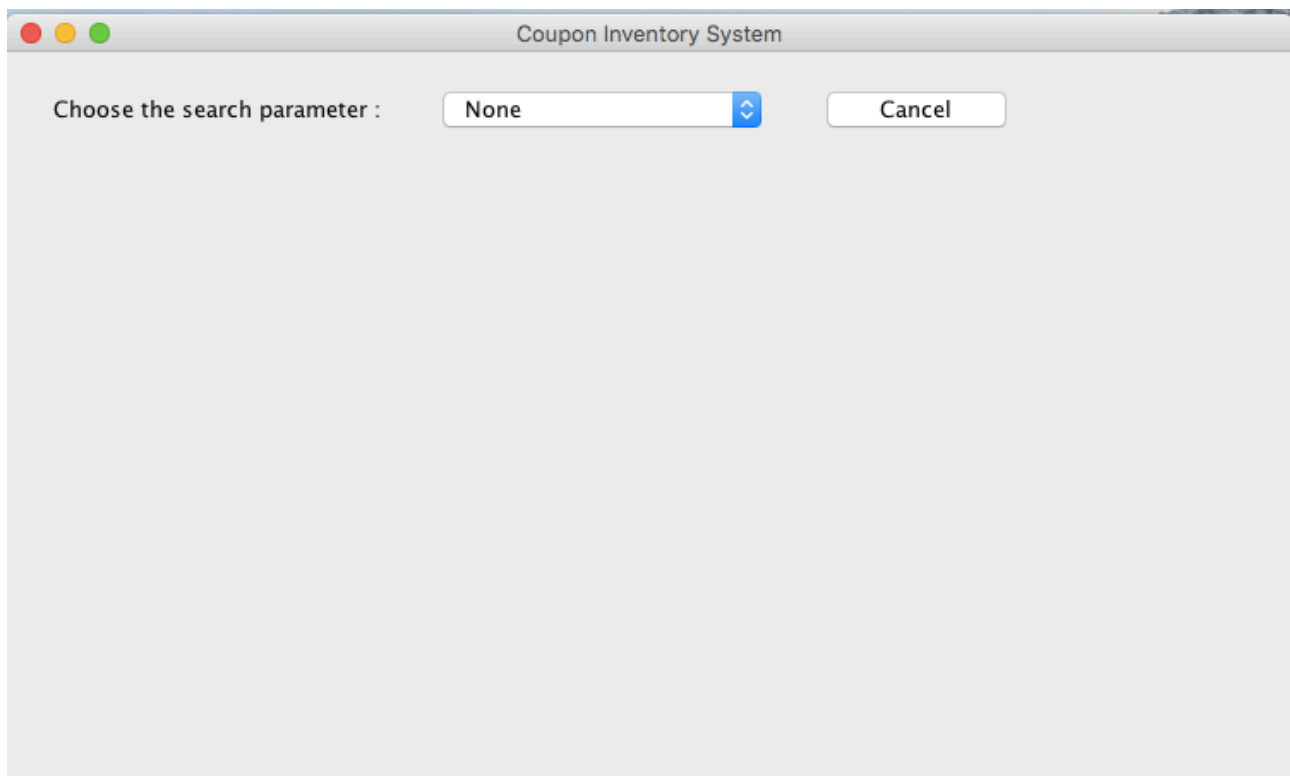


The screenshot shows a window titled "Coupon Inventory System". It contains several input fields and validation messages:


- Coupon Site : Must be alphabets & limited to 10 char
- Product name : Must be alphabets & limited to 20 char
- Original Price : Must be a positive value
- Discount Rate : Must be a positive value
- Expiration Period : Must be number of days between (1-365)
- Status of Coupon : ☒ Unused ☐ Redeemed

At the bottom of the form are "Proceed" and "Cancel" buttons. A "Message" popup window is displayed in the foreground, showing a stack of coins icon and the text "Coupon has been entered into the inventory". It has an "OK" button.

User can choose to search for coupon from the inventory by clicking the search coupon button. On clicking the search button, below screen appears.

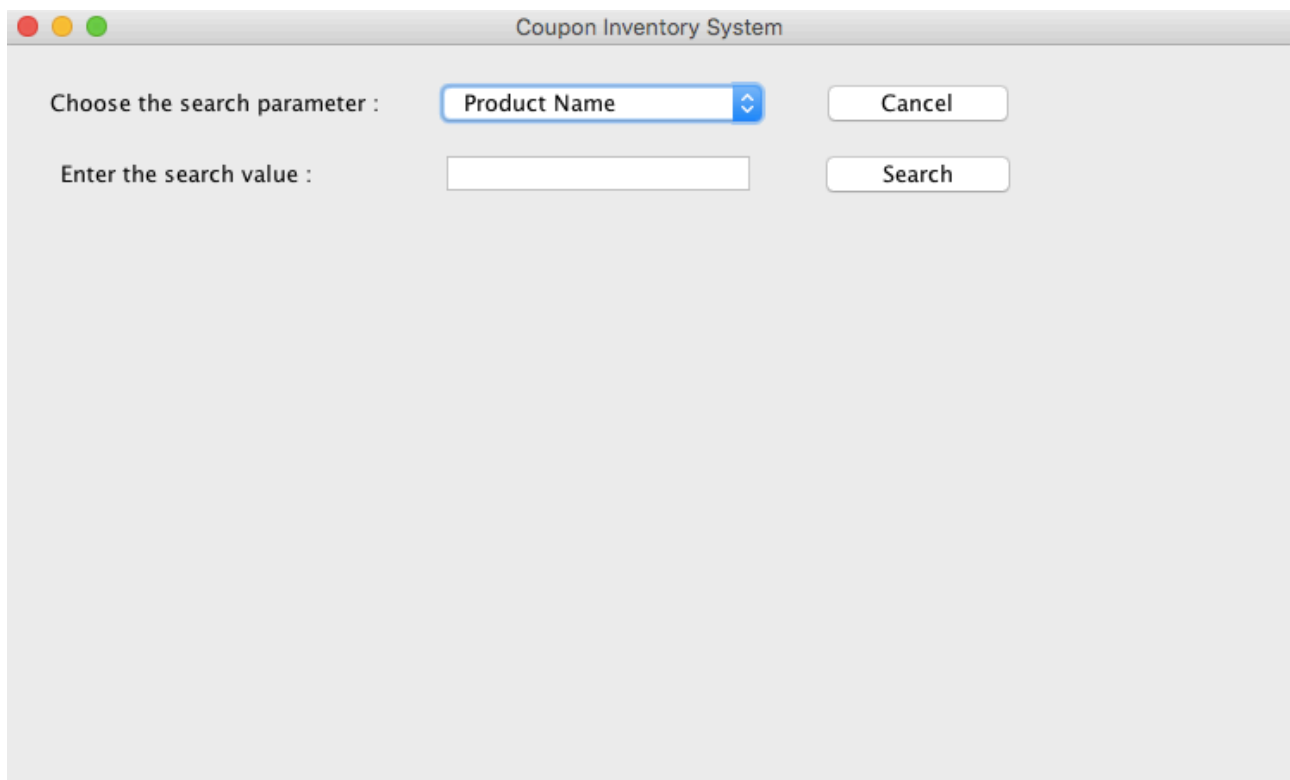


The screenshot shows a window titled "Coupon Inventory System". It contains a search parameter selection area:

Choose the search parameter : 

The rest of the window is empty.

User then needs to select per which attribute the user wants to search the coupon as below.

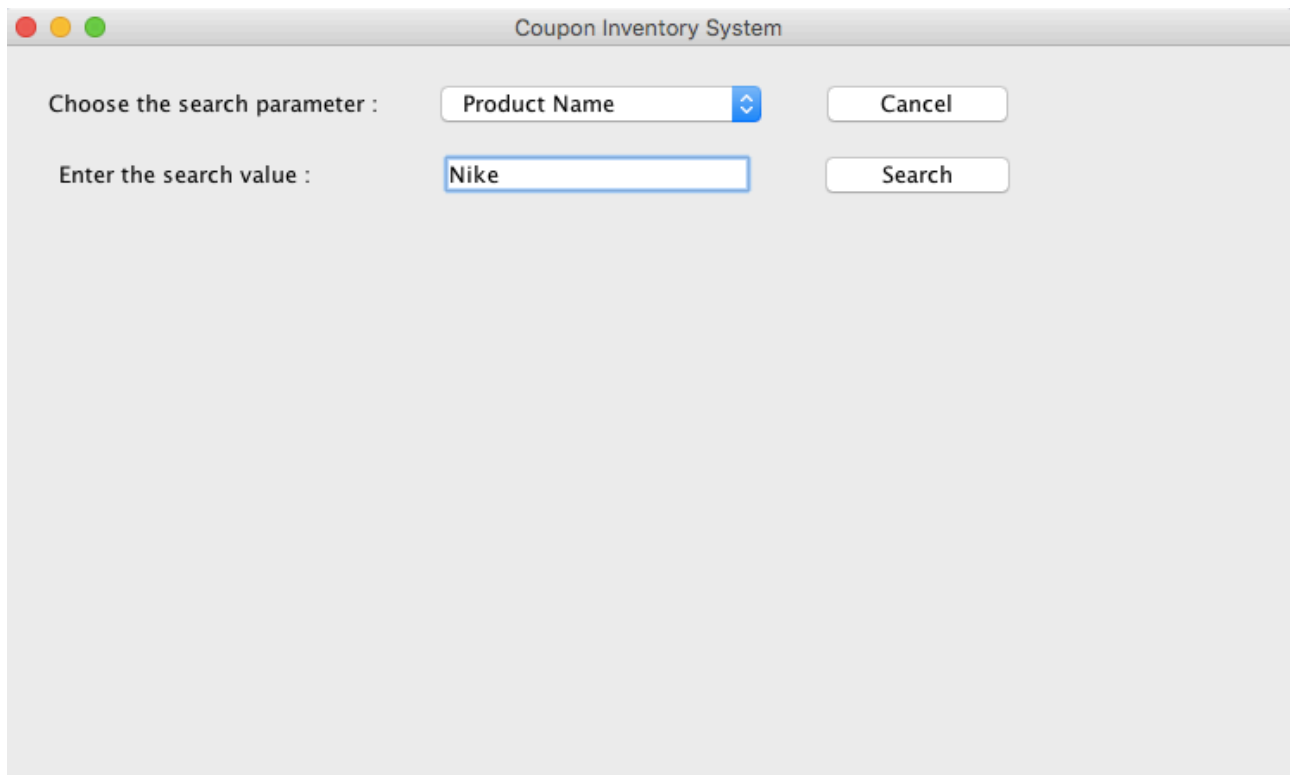


Coupon Inventory System

Choose the search parameter :

Enter the search value :

Then the user needs to enter the value of the attribute which should be searched.
In the below example, we are trying to search coupon based on product name 'Nike'.



Coupon Inventory System

Choose the search parameter :

Enter the search value :

If the entered attribute is found then the result is displayed as below.

Coupon Inventory System

Choose the search parameter :

Enter the search value :

Found 2 match
By Linear search it took 8 comparison and by Binary search it took 4 comparison

Coupon Provider	Product Name	Price	Discount Rate	Expiration	Redeemed/Un...	finalprice
groupon	nike	100.0	10.0	60	Unused	90.0
Apple	nike	50.0	20.0	60	Unused	40.0

And if the coupon is not found then it gives below message.

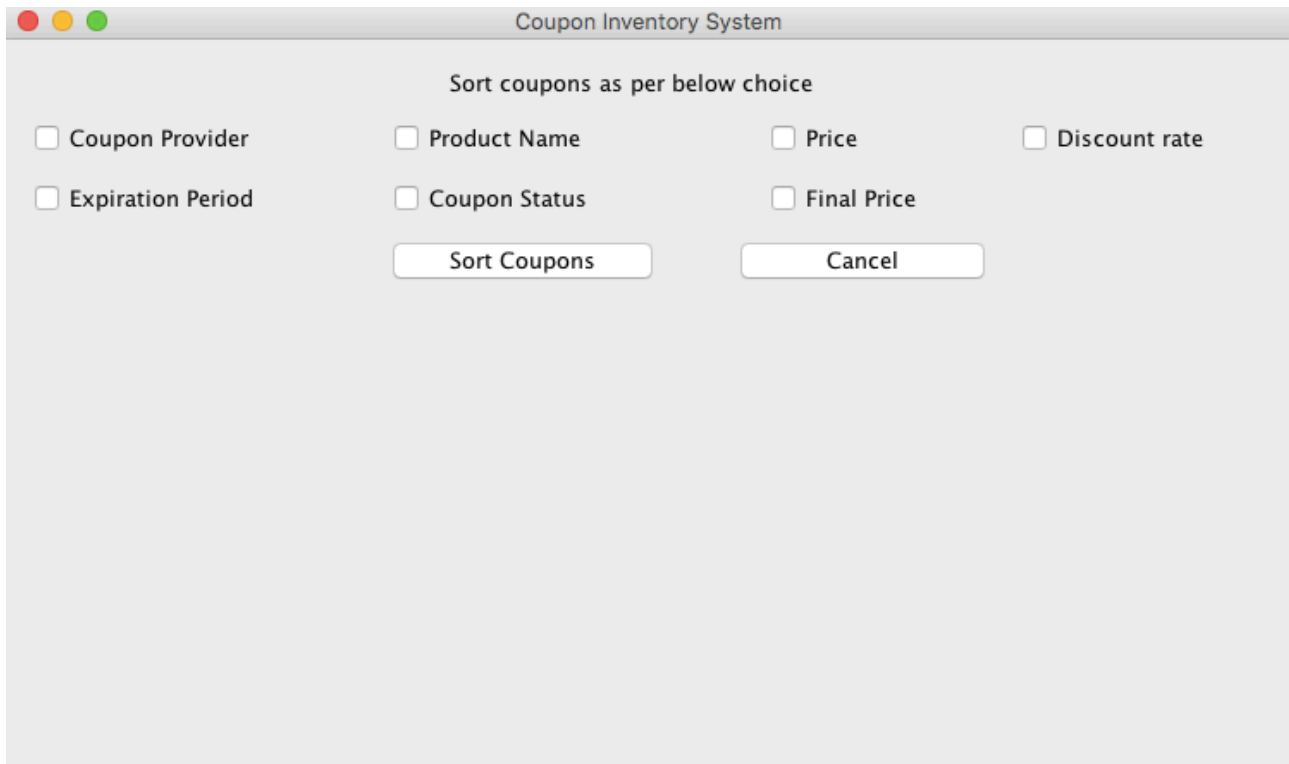
Coupon Inventory System

Choose the search parameter :

Enter the search value :

No Match Found
By Linear search it took 10 comparison and by Binary search it took 3 comparison

User can come out of the search window by clicking cancel button anytime.
If the user wants to list all the coupons in ascending order, the list coupons button must be clicked which pops up a screen as below.



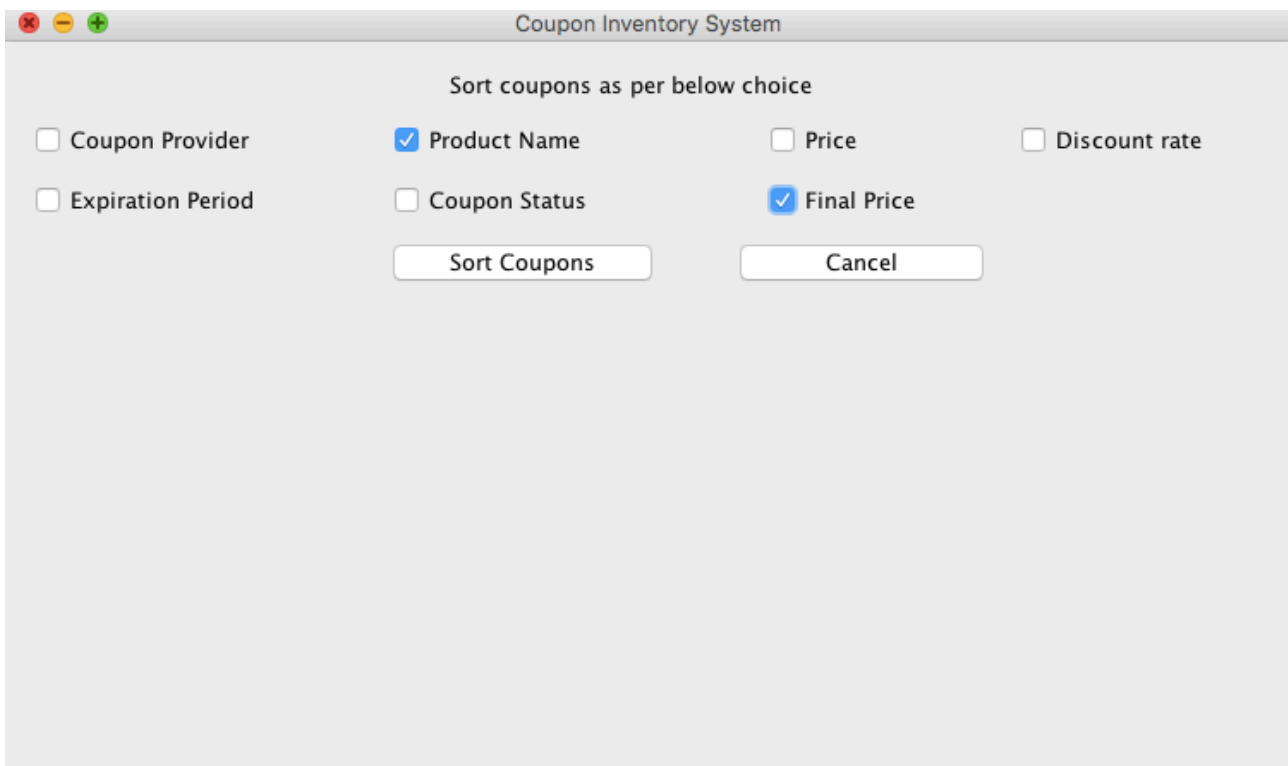
Coupon Inventory System

Sort coupons as per below choice

☐ Coupon Provider ☐ Product Name ☐ Price ☐ Discount rate

☐ Expiration Period ☐ Coupon Status ☐ Final Price

User can select the attributes per which they want to sort the coupons.
Maximum three attributes can be selected. If the user select more than three, it won't make any change to the output.



Coupon Inventory System

Sort coupons as per below choice

☐ Coupon Provider ☒ Product Name ☐ Price ☐ Discount rate

☐ Expiration Period ☐ Coupon Status ☒ Final Price

Here we are trying to sort the coupons based on product name and final price.
For sort to begin, user must click sort coupons.

The screenshot shows a window titled "Coupon Inventory System". Inside, there's a section "Sort coupons as per below choice" with several checkboxes: "Coupon Provider", "Product Name" (checked), "Price", "Discount rate", "Expiration Period", "Coupon Status", and "Final Price" (checked). Below these are "Sort Coupons" and "Cancel" buttons. A table lists various coupons with columns: Coupon Provider, Product Name, Price, Discount Rate, Expiration, Redeemed/Un..., and finalprice.

Coupon Provider	Product Name	Price	Discount Rate	Expiration	Redeemed/Un...	finalprice
Grp	adidas	12.0	50.0	10	Unused	6.0
WorldFree	armaniwatch	1000.0	20.0	30	unused	800.0
wecoupons	grapes	10.0	2.0	8	Unused	9.8
gofree	gucci	50.0	5.0	90	reedemed	47.5
BestBuy	ipadfourmini	300.0	20.0	10	Unused	240.0
Ubereats	mcd	20.0	25.0	3	Unused	15.0
Apple	nike	50.0	20.0	60	Unused	40.0
groupon	nike	100.0	10.0	60	Unused	90.0
Your_Cou	Pencils	10.0	50.0	10	Unused	5.0
Uber	subway	20.0	50.0	5	Unused	10.0

To return to the menu screen, user should click cancel button.

(i) Data File

```
groupon nike 100.0 10.0 60 Unused
WorldFree armaniwatch 1000.0 20.0 30 unused
gofree gucci 50.0 5.0 90 reedemed
Uber subway 20.0 50.0 5 Unused
Ubereats mcd 20.0 25.0 3 Unused
BestBuy ipadfourmini 300.0 20.0 10 Unused
Apple nike 50.0 20.0 60 Unused
wecoupons grapes 10.0 2.0 8 Unused
Grp adidas 12.0 50.0 10 Unused
```