

SOFTWARE ENGINEERING PROBLEM SPECIFICATION TABLE:

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| CLIENT | Mercado Libre |
| USER | Sellers of Mercado Libre |
| FUNCTIONAL REQUIREMENTS | <ol style="list-style-type: none">1. Register a new product2. Make an Order3. Remove from the inventory all elements purchased in an order4. Add elements to the inventory5. The search engine of products must allow the user to search by range for the numbers or by interval for the strings6. The system must allow the user to search for any products by a given filter.7. The system must allow the user to search for any orders by a given filter.8. Persistence9. Search an specific product |
| PROBLEM CONTEXT | <p>Mercado Libre has hired us to develop an application for online sales. For this purpose, they want the application to allow adding and removing products. They also want a functionality to be implemented that allows users to search for products based on various filters, such as name, description, price, available quantity, category, and the number of times purchased.</p> |
| Non-FUNCTIONAL REQUIREMENTS | <ol style="list-style-type: none">1. The program must allow the user to add as many products as he wants.2. The search engine must use the binary search algorithm.3. The program to implement data persistence using JSON serialization model4. The project must be developed using Test Driven Development |

Functional Requirements Analysis Table:

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| Name or ID | 1. Register a new product | | |
| Summary | The system must be able to enter information about a new product | | |
| Inputs | Input name | Data type | Selection or repetition condition |
| | name | String | the string cannot be empty |
| | description | String | the string cannot be empty |
| | price | double | price needs to be greater than 0 |
| | amount | int | amount needs to be greater than 0 |
| | category | Category | category must be within the given range |
| General activities necessary to achieve the results | The system will create the product object and depending on its category, it will be added to one database or another. | | |
| Result or postcondition | The system will verify that the information is valid, and if it is, it will be added to the database and a message will be displayed informing that the product was added correctly, otherwise a message will be sent informing of the problem. | | |
| Outputs | Output name | Data type | Selection or repetition condition |
| | Message | String | |

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| Name or ID | 2. Make an Order | | |
| Summary | The system must allow the user to make an order. The order may have one or many products. | | |
| Inputs | Input name | Data type | Selection or repetition condition |
| | buyerName | String | the string cannot be empty |
| | productsList | ArrayList<String> | While the input string is not equal to 0, the process of adding products will be repeated. The requested quantity of the product must match the inventory. |
| | purchaseDate | String | If the user is buying somethings products |
| General activities necessary to achieve the results | The system verifies that the data is correct, as well as checking if the requested quantities are consistent with the inventory, and then generates the order, saving it in the database | | |
| Result or postcondition | If there is no issue, the system will return a message confirming that the order has been successfully added and add the order to the database. Otherwise, it will return an error message. | | |
| Outputs | Output name | Data type | Selection or repetition condition |
| | message | String | |

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| Name or ID | 3. Remove from the inventory all elements purchased in an order | | |
| Summary | When an order is placed, the requested quantity of the product will be deducted from the inventory (only if the requested quantity is consistent). | | |
| Inputs | Input name | Data type | Selection or repetition condition |
| | productName | String | The product name must match one in the inventory |
| | amount | int | The quantity must be greater than 0. |
| General activities necessary to achieve the results | The system will search for the product in the database based on the name and subtract the quantities from the inventory. | | |
| Result or postcondition | The system will verify the requested quantity of the product. If it is coherent, it will subtract it from the inventory; otherwise, it will throw an exception. | | |
| Outputs | Output name | Data type | Selection or repetition condition |
| | eMessage | AmountException | If the requested quantity is inconsistent with the inventory |

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| Name or ID | 4. Add elements to the inventory | | |
| Summary | The system will allow the user to select a product and increase its quantity in stock. | | |
| Inputs | Input name | Data type | Selection or repetition condition |
| | productName | String | The product name must match one in the inventory |
| | amount | int | The quantity must be greater than 0. |
| General activities necessary to achieve the results | The system will search for the product in the database based on the name and increase its stock level. | | |
| Result or postcondition | The system will search for the product and add the quantities, if the quantities to be added are negative it will throw an exception | | |
| Outputs | Output name | Data type | Selection or repetition condition |
| | eMessage | negativeException | only if the amount is less than 1. |

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| Name or ID | 5. The search engine of products must allow the user to search by range for the numbers or by interval for the strings | | |
| Summary | The system must be able to filter the information by a range or an interval given by the user. | | |
| Inputs | Input name | Data type | Selection or repetition condition |
| | minorLimit | Integer | If the user is filtering by numbers |
| | mayorLimit | | |
| | initLetter | String | If the user is filtering by a letter |
| | initPrefix | | If the user is filtering by a prefix |
| | lastLetter | | If the user is filtering by a letter |
| | lastPrefix | | If the user is filtering by a prefix |
| General activities necessary to achieve the results | The system must search all elements that are in the interval or range and return all these elements | | |
| Result or postcondition | An array with the elements is ready to be sorted and showed to the user | | |
| Outputs | Output name | Data type | Selection or repetition condition |
| | array | Product[] | If the user has entered an interval or range to filter the information |

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| Name or ID | 6. The system must allow the user to search for any products by a given filter. | | |
| Summary | The system must have a search engine for the products. The search engine must allow the user to search for any products by their name, price, category, and number of times bought. | | |
| Inputs | Input name | Data type | Selection or repetition condition |
| | filter | integer | If the user is searching for any products using a given filter |
| | array | Product[] | If the system has found products with the previous filter |
| General activities necessary to achieve the results | when the system knows what filter that will use, it will will organize the products to be shown. | | |
| Result or postcondition | The system has extracted the required information and has sorted that to be shown. | | |
| Outputs | Output name | Data type | Selection or repetition condition |
| | products | String | If the user is searching for any products and they exist in the system |
| | error | Exception | If the products required are not saved in the system yet |

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| Name or ID | 7. The system must allow the user to search for any orders by a given filter. | | |
| Summary | The system must have a search engine for the made orders. The search engine must allow the user to search for any orders by their buyer name, final price, and date of purchase. | | |
| Inputs | Input name | Data type | Selection or repetition condition |
| | filter | Integer | If the user is searching for any orders using a given filter |
| General activities necessary to achieve the results | when the system knows what is the filter that will use, it will search the required information and will organize that to be shown. | | |
| Result or postcondition | The system has extracted the required information and has sorted that to be shown. | | |
| Outputs | Output name | Data type | Selection or repetition condition |
| | orders | String | If the user is searching for any orders and they exist in the system |
| | error | Exception | If the orders required are not saved in the system yet |

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| Name or ID | 8. Persistence | | |
| Summary | The system must be able to persist the information that an user has inserted in it although the program will be closed. | | |
| General activities necessary to achieve the results | For that, when the program will be closed all changes or new information will be saved in a txt document to be charged when the user opens the program again. | | |
| Result or postcondition | All information will be saved to be charged when the user opens the program again. | | |

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| Name or ID | 9. The system must allow the user to search for a specific product . | | |
| Summary | The system must allow the user to search for a product using the name, amount, sales and category of the product. | | |
| Inputs | Input name | Data type | Selection or repetition condition |
| | name | String | If the user is searching for a specific product |
| | amount | int | |
| | sales | int | |
| | category | int | |
| General activities necessary to achieve the results | The system tries to search for the product. If the product is registered in the system, it will return the amount of that product. Else, the system must show an error | | |
| Result or postcondition | The system has extracted the required amount and can show it. | | |
| Outputs | Output name | Data type | Selection or repetition condition |
| | amount | int | If the user is searching for a specific product |
| | error | Exception | If the product is not registered |