# COMP 201 Coursework 1

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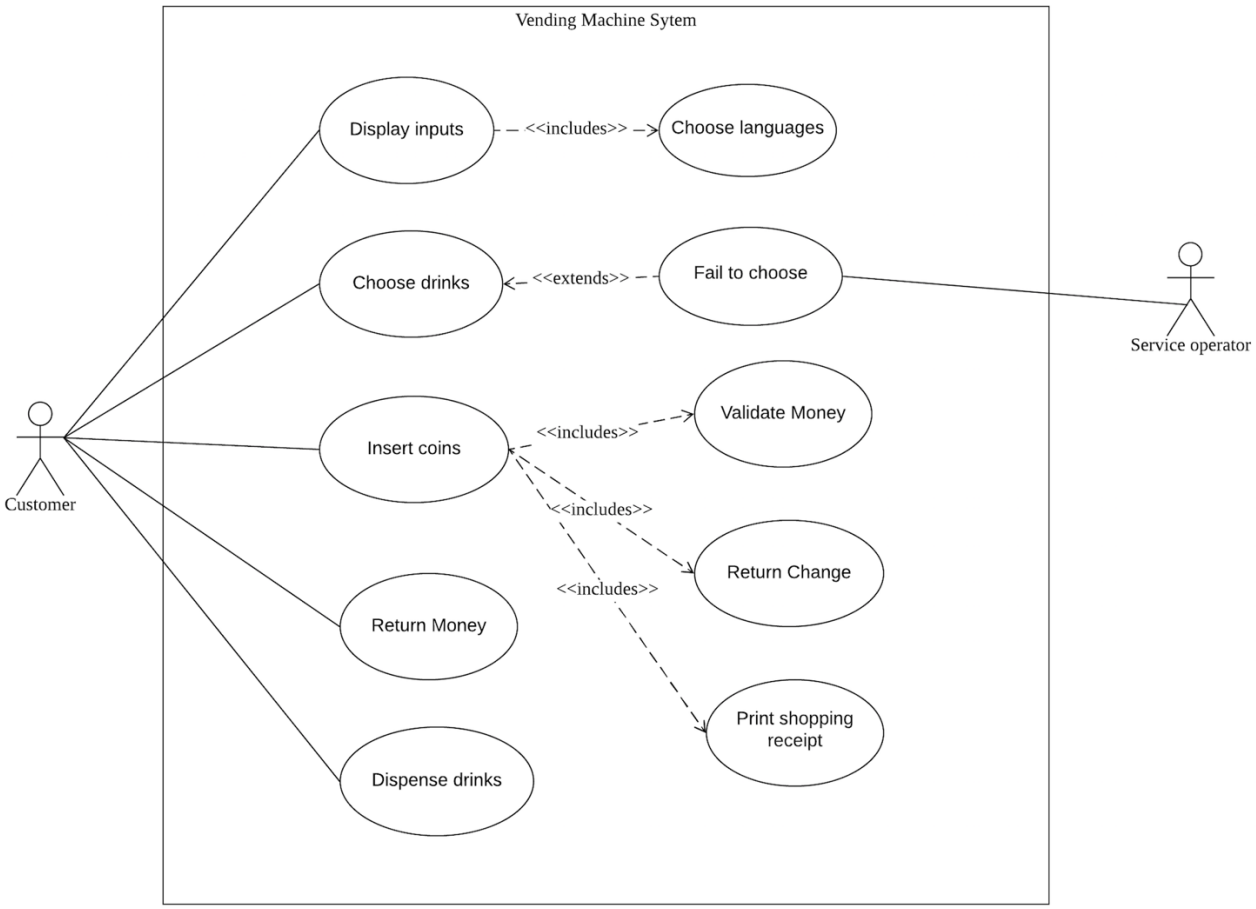
# ***Section 1***

## Customer Diagram




## Customer Use cases

| ID | UC 1 |
|---|---|
| Name | Display inputs |
| Description | Inform the customer of the details of the current transaction, such as:<br>1.Display recipes and price<br>2.Show the monetary amount that customer has provided in the purchasing process<br>3.Display transaction time<br>4.Display changes immediately<br>5. Reset the balance after a transaction<br>6.Display “Sold out” if the drinks is unavailable" |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1.Press ‘Begin Purchase button’<br>2.Choose language option<br>3.Display current transaction |
| Post-condition | If it is available, display information on the screen |
| Includes | Use case 6 “Choose Languages” |
| Extensions | |
| Triggers | Begin purchase request entered |

| ID | UC 2 |
|---|---|
| Name | Choose Drinks |
| Description | Allow the selection of a drink by customer via keypad and produce the drink after proper purchase |
| Pre-conditions | Vending drink machine in service |
| Event flow | Choose drinks options via keypad<br>drinks request entered |
| Post-condition | Select drinks' number will display |
| Includes | |
| Extensions | Use case 7"Fail to choose" |
| Triggers | Press keypad select number |

| ID | UC 3 |
|---|---|
| Name | Insert coins |
| Description | Customer inserts coins to purchase the drinks |
| Pre-conditions | 1.Vending drink machine in service<br>2.There are enough coins in the machine for exchanging the customer payments<br>3. Cash box is not full |
| Event flow | 1.Check cash box, if it is full, reject the transaction and sent alert to service operator; if not, allow to insert coins to purchase<br>2.Show the monetary amount that customer has provided in the purchasing process<br>3.Display changes immediately on screen |
| Post-condition | Balance of inputted coins updated |
| Includes | Use case 8“Validate money”<br>Use case 9“Return change”<br>Use case 10“Print shopping receipt” |
| Extensions | |
| Triggers | Insert coins request entered |

| ID | UC 4 |
| --- | --- |
| Name | Return money |
| Description | Enables a customer to have their inputted money return to them if they decide not to purchase a drink, before producing the drinks |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1.Cancel the transaction<br>2.Return the money<br>3.Display balance |
| Post-condition | Reset the balance to 0 |
| Includes | |
| Extensions | |
| Triggers | Cancel the transaction request entered |

| ID | UC 5 |
| --- | --- |
| Name | Dispense drinks |
| Description | Customer picks up drinks |
| Pre-conditions | 1.Vending drink machine in service<br>2.There are enough disposable cups to dispense drinks |
| Event flow | 1.After completing producing drinks including: heat up water, mix drinks, fill the cups, clean the vessel<br>2.Deliver drinks to the customer<br>3.Customers pick up the drinks |
| Post-condition | Reset balance to 0 |
| Includes | |
| Extensions | |
| Triggers | Receive the message that the drinks are ready |

| ID | UC 6 |
|---|---|
| Name | Choose language |
| Description | Choose a preferred language |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1.Choose the Language select option<br>2.Select languages and press yes |
| Post-condition | If the language changed successfully, then the display will change into that language immediately |
| Includes | |
| Extensions | |
| Triggers | Select language request entered |

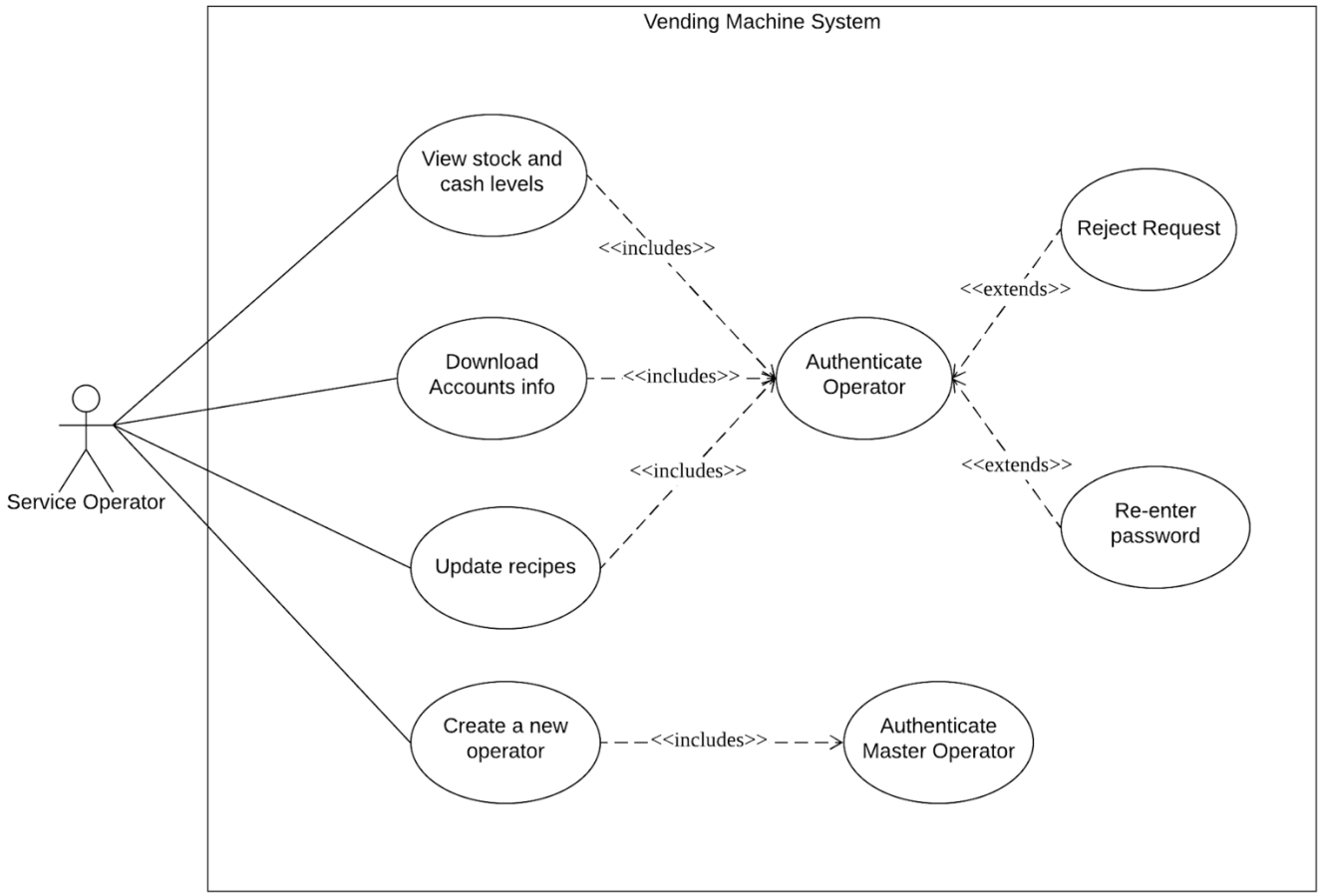
| ID | UC 7 |
| --- | --- |
| Name | Fail to choose |
| Description | If the level of integrant stock is too low or the cash box is full or plastic cups are run out, customer cannot choose drinks, and system will send alert to the service operator |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1.If the only problem is stock, choose another drinks<br>2. If the problem is cash box or cups numbers, customer can chooses cancel transactions and return money |
| Post-condition | Return to the home page on screen |
| Includes | |
| Extensions | |
| Triggers | Stock is too low or the cash box is full or plastic cups are run out |

| ID | UC 8 |
| --- | --- |
| Name | Validate Money |
| Description | Check the input coins is valid and return any object that it deems invalid |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1.Inserts coins<br>2.Validate and calculate coins<br>3.Return invalid coins |
| Post-condition | Balance of valid coins updated |
| Includes | |
| Extensions | |
| Triggers | Validate Money request entered |

| ID | UC 9 |
|---|---|
| Name | Return Change |
| Description | Checks to make sure that change is available and enable the vending machine to return additional change after purchase |
| Pre-conditions | 1.Vending drink machine in service<br>2.There are enough coins in the machine for exchanging the customer payments<br>3. Cash box is not full |
| Event flow | 1.Validate and calculate coins<br>2.Display changes immediately<br>3.Retrun Change |
| Post-condition | Balance minus the cost |
| Includes | |
| Extensions | |
| Triggers | Coins inputted greater than drinks cost |

| ID | UC 10 |
| --- | --- |
| Name | Print shopping receipt |
| Description | customer whether print the shopping list or not |
| Pre-conditions | Vending drink machine in service |
| Event flow | Choose receipt option |
| Post-condition | Print receipt |
| Includes | |
| Extensions | |
| Triggers | Receipt option request entered |

# Operator Diagram




# Operator Use cases

| ID | UC 1 |
|---|---|
| Name | View stock and cash levels |
| Description | See how many days the integrant of the drinks can be used and the cash levels internet, if the cash box is full or the stock level is too low, send alert to engineer |
| Pre-conditions | 1.Vending drink machine in service<br>2.The connection between machine and internet is not broken |
| Event flow | 1.Choose to view stock levels<br>2.Choose to view cash levels |
| Post-condition | Display stock level and cash level |
| Includes | Use case 5“Authenticate Operator” |
| Extensions | |
| Triggers | Check stock and cash levels request entered |

| ID | UC 2 |
| --- | --- |
| Name | Download accounts information |
| Description | Download customer accounts information from the machine for a particular period |
| Pre-conditions | 1.Vending drink machine in service<br>2.The connection between machine and internet is not broken |
| Event flow | 1.Make requests to download accounts information<br>2.Enter the particular period<br>2.Download accounts information from the machine |
| Post-condition | Update download history |
| Includes | Use case 5“Authenticate Operator” |
| Extensions | |
| Triggers | Download customer information request entered |

| ID | UC 3 |
|---|---|
| Name | Update recipes |
| Description | Update new drinks recipes to the machine via internet |
| Pre-conditions | 1.Vending drink machine in service<br>2.The connection between machine and internet is not broken |
| Event flow | 1.Choose to update recipes<br>2.Update new recipes to the machine |
| Post-condition | Display new drinks recipes |
| Includes | Use case 5“Authenticate Operator” |
| Extensions | |
| Triggers | Update recipes request entered |

| ID | UC 4 |
|---|---|
| Name | Create a new operator |
| Description | Create a new operator account in case the machines memory has been wiped due to hardware failure |
| Pre-conditions | 1.Vending drink machine in service<br>2.The connection between machine and internet is not broken |
| Event flow | 1.Choose to create a new account<br>2.Authenticate Master Operator<br>3.Use re-enter password if password incorrect |
| Post-condition | New operated is created |
| Includes | Use case 5“Authenticate Master Operator” |
| Extensions | Use case 7“Re-enter password” |
| Triggers | Master password entered |

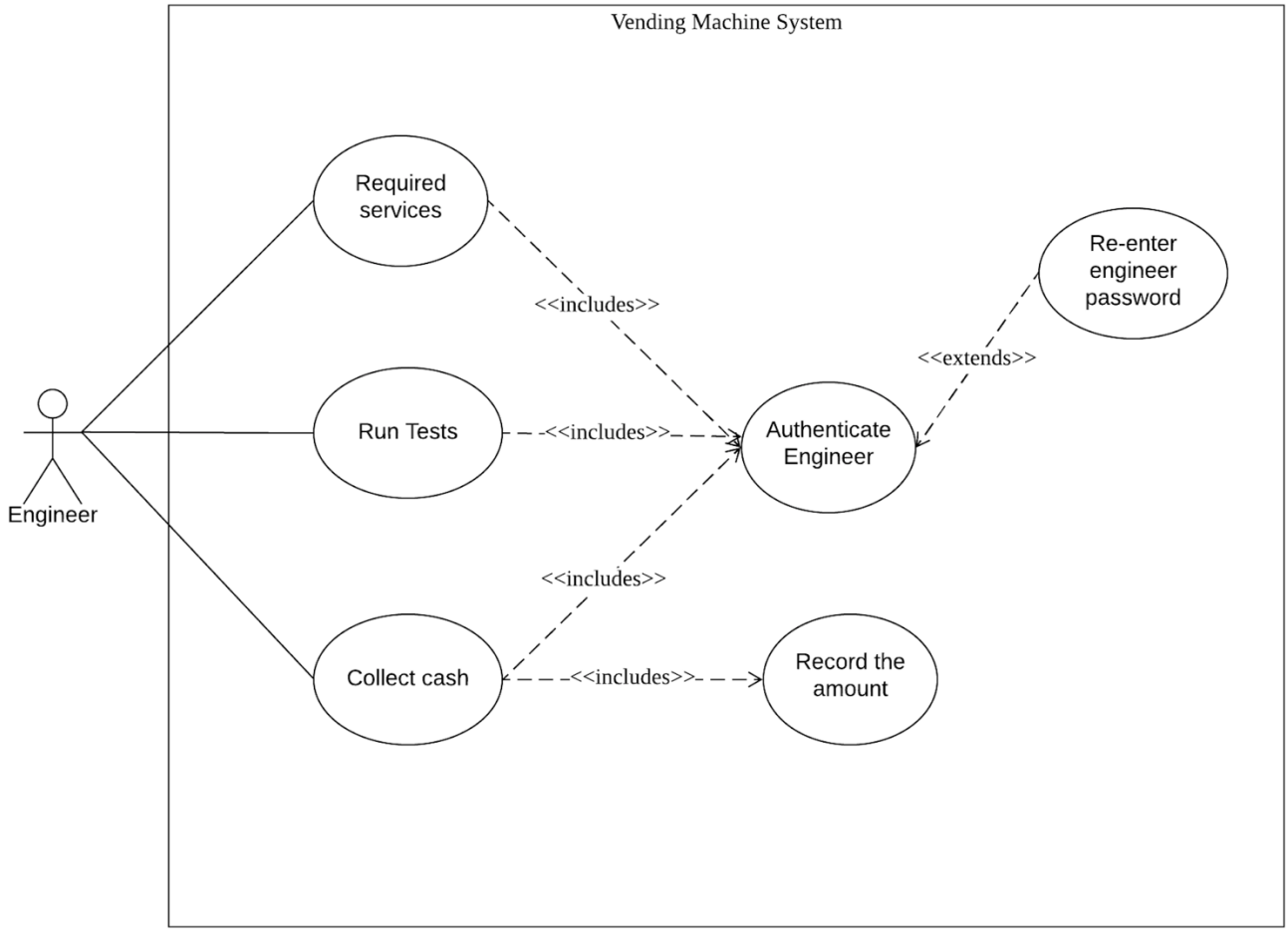
| ID | UC 5 |
|---|---|
| Name | Authenticate Operator |
| Description | Operator proves their identity to the online website |
| Pre-conditions | 1.Vending drink machine in service<br>2.The connection between machine and internet is not broken |
| Event flow | 1. Choose to authenticate operator identity<br>2. User enters password<br>3. User re-enters password if password incorrect |
| Post-condition | Operator is authenticated if credentials correct |
| Includes | |
| Extensions | Use case 7“Re-enter password”<br>Use case 8“Reject entering” |
| Triggers | Authenticated service requested and operator not authenticated |

| ID | UC 6 |
|---|---|
| Name | Authenticate Master Operator |
| Description | Master operator proves their master identity before creating a new account |
| Pre-conditions | 1.Vending drink machine in service<br>2.The connection between machine and internet is not broken |
| Event flow | 1. Choose to authenticate operator master identity<br>2. User enters password<br>3. User re-enters password if password incorrect |
| Post-condition | Master operator is authenticated if credentials correct |
| Includes | |
| Extensions | |
| Triggers | Authenticated service requested and operator not authenticated |

| ID | UC 7 |
|---|---|
| Name | Re-enter the password |
| Description | Enter the password again, if password incorrect |
| Pre-conditions | Vending drink machine in service |
| Event flow | Enter password again |
| Post-condition | Operator is  authenticated if password correct |
| Includes | |
| Extensions | |
| Triggers | Authenticated password requested |

| ID | UC 8 |
| --- | --- |
| Name | Reject entering |
| Description | Enter the incorrect password more than 3 times, reject entering request |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1.Enter 3 times incorrect password<br>2.Reject entering |
| Post-condition | User cannot press the password to enter |
| Includes | |
| Extensions | |
| Triggers | 3 times incorrect password entered |

# Engineer Diagram




# Engineer Use cases

| ID | UC 1 |
|---|---|
| Name | Required services |
| Description | Check the stock and fill the stock of dinks integrant and the number of cups |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1.Machine sends required services<br>2.Verify identity and turn into service model<br>3. Fill the stock of dinks integrant and the number of cups |
| Post-condition | Turns into service model |
| Includes | |
| Extensions | Use case 4“ Authenticate Engineer” |
| Triggers | 3 times incorrect password entered |

| ID | UC 2 |
|---|---|
| Name | Run tests |
| Description | Run a series of tests via using the keypad |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1.Verify identity and turn into service model<br>2. Run the tests |
| Post-condition | Update test taken history |
| Includes | Use case 4“ Authenticate Engineer” |
| Extensions | |
| Triggers | Tests requirements entered |

| ID | UC 3 |
|---|---|
| Name | Collect cash |
| Description | Collect the cash if the cash box is full and record the amount collected |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1.Verify identity and turn into service model<br>2. Collect the cash<br>3. Record the amount collected |
| Post-condition | Balance of cash box amount updated |
| Includes | Use case 4“ Authenticate Engineer”<br>Use case 5“ Record the amount” |
| Extensions | |
| Triggers | Collect cash request entered |

| ID | UC 4 |
|---|---|
| Name | Authenticate Engineer |
| Description | Engineer proves their identity to the vending machine |
| Pre-conditions | Vending drink machine in service |
| Event flow | 1. Choose to authenticate engineer identity<br>2. User enters password<br>3. User re-enters password if password incorrect |
| Post-condition | Engineer is authenticated if credentials correct |
| Includes | |
| Extensions | Use case 6“Re-enter engineer password” |
| Triggers | Authenticated service requested and engineer not authenticated |

| ID | UC 5 |
|---|---|
| Name | Record the amount |
| Description | Record the amount collected into the keypad |
| Pre-conditions | Vending drink machine in service |
| Event flow | Record the collected amount |
| Post-condition | Updated balance amount |
| Includes | |
| Extensions | |
| Triggers | Record the amount request entered |

| ID | UC 6 |
| --- | --- |
| Name | Re-enter engineer password |
| Description | Enter the password again within a short time interval, if timeout, turn into alert model and send warning |
| Pre-conditions | Vending drink machine in service |
| Event flow | Enter engineer password again within a short time interval |
| Post-condition | Operator is  authenticated if password correct |
| Includes | |
| Extensions | |
| Triggers | Authenticated password within a short time interval requested |

## ***Section 2***

Non-function Requirements

| | |
|---|---|
| Non- function 1 Description | After choosing the drinks, Customer have to pay for the drink within 1 minute, if not, the system will automatically rollback to the home page |
| Participant | 100 participants from different background |
| Test Processing | 1.100 participants buy the drinks via vending machine one by one<br>2.Record the time between choosing the drinks and purchasing rollback<br>3.Calculate the average time and the probability<br>4.Draw the graph<br>5.compare to the 1 minute |
| Predict Results | 99.9% of the test shows that the payment limited time is 1 minute |

| | |
|---|---|
| Non- function 2 Description | When the stock level is only for 10 days, the stock sensor should send alert to the service operator |
| Participant | 100 participants from different background |
| Test Processing | 1.100 participants test the stock level one by one<br>2.Record the stock level before the sensor sends alert to the operator.<br>3.Calculate the residual about stock level and draw the graph |
| Predict Results | 99.9% of the test shows that the payment limited time is 1 minute |

| | |
|---|---|
| Non- function 3 Description | After inserting the coins, the response time of vending machine displaying charge or current inputted amount should be 0.2 seconds |
| Participant | 100 participants from different background |
| Test Processing | 1.100 participants insert one pound coin in to the vending machine one by one<br>2.Record the time between insert coin action and display numbers on screen<br>3.Calculate the average time and the probability<br>4.Draw the graph |
| Predict Results | 99.9% of the test shows that the response time is 0.2 seconds |

| | |
|---|---|
| Non- function 4 Description | When the sensor water temperature reaches 100 degrees Celsius, stop heating |
| Participant | 100 participants from different background |
| Test Processing | 1.100 participants test the water temperature on by one when system stops heating water<br>2.Record the water temperatures when the sensor stops heating up water<br>3.Calculate the average temperature and the probability of 100 degree Celsius<br>4.Draw the graph |
| Predict Results | 99.9% of the test shows that when water temperature reaches up to 100 degree Celsius, stop heating |

| | |
|---|---|
| Non- function 5 Description | After producing drinks, the vending machine shall be able to deliver dinks to customer within 6 seconds |
| Participant | 100 participants from different background |
| Test Processing | 1.100 participants buy the drinks via vending machine one by one<br>2.Record the time of delivering the drinks to the customer<br>3.Calculate the average time and the probability<br>4.Draw the graph and compare to 6 minutes |
| Predict Results | 99.9% of the test shows that the deliver time of the drinks is 6 seconds |