# Homework: Software Quality Assurance Introduction

## Think Testing: Gas Station

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| **Problem #1** | Wrong fuel |
| **Problem #2** | Engine problem (antifreeze, overheated, accumulator is down and etc..) |
| **Problem #3** | Software problem ( Software reports an empty tank ) |
| **Problem #4** | Wrong car |

## Think Testing: Tooth Brushing

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| **Step #1** | Wash your hand to be sure that they are clean |
| **Step #2** | Open the tube and put a little ( over the whole bristles ) toothpaste |
| **Step #3** | A little bit water over the head of the tooth |
| **Step #4** | brush over the right down teeth 5 times |
| **Step #5** | brush over the right up teeth 5 times |
| **Step #6** | brush over the left down teeth 5 times |
| **Step #7** | brush over the left up teeth 5 times |
| **Step #8** | clenched teeth |
| **Step #9** | Brush the right side of the teeth 10 times |
| **Step #10** | Brush the left side of the teeth 10 times |
| **Step #11** | Open the mouth |
| **Step #12** | Brush the down right back of the teeth 5 times |
| **Step #13** | Brush the up right back of the teeth 5 times |
| **Step #14** | Brush the up left back of the teeth 5 times |
| **Step #15** | Brush the down left back of the teeth 5 times |
| **Step #16** | rinse your mouth several times |

## Think Testing: 5 Kg Bag

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| **Test #1** | **The bag**  Check the bag:   * Is it a bag * Is it made of paper * are there handles * is it broken |
| **Test #1** | **5kg sharp grocery products**  **Steps:** fill the bag with sharp grocery products  **How to check:**   * take the bag and check the handles * is the product still inside the bag * is the bag ripped |
| **Test #2** | **5kg frozen products**  **Steps:** fill the bag with frozen grocery products  **How to check:**   * take the bag and check the handles * is the product still inside the bag * is the paper wet and how much time handle the products |
| **Test #3** | **Less than 5kg products**  **Steps:** fill the bag with grocery products that are less than 5kg  **How to check:**   * take the bag and check the handles * is the product still inside the bag |
| **Test #4** | **More than 5kg products**  **Steps:** fill the bag with grocery products that are more than 5kg  **How to check:**   * take the bag and check the handles * is the product still inside the bag |
| **Test #5** | **More than one use of the bag**  **Steps:**   * fill the bag with grocery products * do the check * take the products out of the bag * repeat several times   **How to check:**   * take the bag and check the handles * is the product still inside the bag |
| **Test #6** | **Smell test**  Is the bag smell |
| **Test #7** | **Drop test**  **Steps:**   * fill the bag with grocery products * take it 1m off the ground * drop it   **How to check:** check if the bag is ripped |
| **Test #8** | **Stains**  **Steps:**   * fill the bag with grocery products * take it and make a few steps   **How to check:** does it stain the hands |

## Login Form UX Problems

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| **Problem #1** | URL have to be “My-wonderful-shop.com/login” – name of the app and the website is diffent and the controller for the view is wrong |
| **Problem #2** | First username/email then pass – switched text inputs |
| … | Missed “register” button |
|  | Log out button – you have to be logged in if you want to log out |
|  | Lost pass have to be under log in |
|  | Log in have to be merge with text input width or on the right of remember me box |
|  | The eye in pass text area – when we can see and when we can`t see the problem |

## Weather Forecast Bug

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| **Mistake** | The developer made the following mistake: the temperatures come from the external source in degrees Fahrenheit, but are displayed in degrees Celsius without a conversion. |
| **Bug (location)** | The bug in the code should be in the module / function, responsible for: convert from Fahrenheit to celsius |
| **Failure (symptoms)** | When the buggy code goes in production, it fails as follows: wrong results, such as extremely hot temperatures (like 78 °C) |

## Age Checking Machine

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| The machine fails when the age is exactly 18; |

## Testing an Electric Water Kettle

### Test Scenario #1: Boil Water

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| Test case #1 | **Boil 1 liter of water 🡪 success** |
| Description | Pour 1 liter of water, start the kettle, and wait until it gets hot. |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the water gets hot and the kettle automatically switches off (2-3 minutes). |
| Expected results | The boiling process should complete in less than 4 minutes.  The water should get hot. **It should be 90…120°C**  The kettle should automatically power off when the water gets too hot.  The kettle lid should stay closed. |

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| Test case #2 | **Boil an empty kettle 🡪 fail** |
| Description | Try to boil an empty kettle (no water inside) and make sure the boiling stops (automatically switches off) almost immediately after starting. |
| Steps | 1. Empty the kettle (pour out any existing water) and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the kettle automatically switches off (0.5-2 seconds). |
| Expected results | The boiling process should complete in less than 2 minutes.  The kettle should automatically power off, shortly after start.  The kettle lid should stay closed.  The kettle lid should stay not hot. |

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| Test case #3 | **Boil not enough water 🡪 fail** |
| Description | Try to boil between 50ml and 150ml, start the kettle and make sure the boiling stops (automatically switches off) almost immediately after starting. |
| Steps | 1. Fill 50-150ml of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the kettle automatically switches off (0.5-2 seconds). |
| Expected results | The boiling process should complete in less than 2 minutes.  The kettle should automatically power off, shortly after start.  The kettle lid should stay closed.  The kettle lid should stay not hot. |

### Test Scenario #2: Lid Test

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| Test case #1 | **Open the lid** |
| Description | Check if the lid is open correctly |
| Steps | Press the button to open the lid |
| Expected results | Correct open lid |

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| Test case #2 | **Close the lid** |
| Description | Check if the lid is open correctly |
| Steps | Close the lid |
| Expected results | lid closed successfully |

### Test Scenario #3: Design – Look and Feel

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| Test case #1 | **Check the kettle capacity** |
| Description | Check if the kettle capacity is 1 liter. |
| Steps | 1. Open the lid 2. Fill 500ml of cold water in the kettle 3. Add 500ml of cold water in the kettle 4. Add 500ml of cold water in the kettle |
| Expected results | The kettle should be overflowing after 1 liter. |

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| Test case #2 | **Check the look and feel** |
| Description | Check the kettle, the base, the power plug, the cables, etc. for obvious problem |
| Steps | 1. Check if the kettle is in working order 2. Check if the base is in working order 3. Check if the power plug is in working order 4. Check if the cables is in working order |
| Expected results | Тhe kettle, the base, the power plug, the cables have to be in working order (в изправност) |

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| Test case #3 | **Check the kettle and base to match** |
| Description | Check if the kettle can be plugged correctly in the base |
| Steps | Plug in the kettle in the base |
| Expected results | Kettle can be plugged correctly in the base |

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| Test case #4 | **Check power consumption** |
| Description | Check if the power consumption is ~ 1500W |
| Steps | Use **Shelly Plug** (orreliable) to measure the power consumption.   * **0** watts when **off** * **1400-1600** watts when **on.** |
| Expected results | The power consumption must be around 1500W. |

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| Test case #5 | **Check for water leaks (течове)** |
| Description | Check the kettle for water leaks |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the water gets hot and the kettle automatically switches off (2-3 minutes). |
| Expected results | No water leaks from the kettle |

### Test Scenario #4: Extreme Test / Special test

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| Test case #1 | **Boil ice cubes** |
| Description | Fill the kettle with ice cubes |
| Steps | 1. Fill 1 liter of ice cubes in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the water gets hot and the kettle automatically switches off (2-3 minutes). |
| Expected results | The boiling process should complete in less than 4 minutes.  The water should get hot ~ **90…120°C**  The kettle should automatically power off when the water gets too hot.  The kettle lid should stay closed. |

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| Test case #2 | **Power off (with the button) during boiling** |
| Description | Turn off the machine with the button during boiling |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait between 1 and 3 minutes and power off the machine with the button |
| Expected results | The boiling process should not be completed  The water should be warm, but not hot  The kettle lid should stay closed. |

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| Test case #3 | **Power off (from the power plug) during boiling** |
| Description | Turn off the machine from the power plug during boiling |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait between 1 and 3 minutes and power off the machine from the power plug |
| Expected results | The boiling process should not be completed  The water should be warm, but not hot  The kettle lid should stay closed |

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| Test case #4 | **low outside temperature** |
| Description | Check if the machine is working correctly at low temperatures outside |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the water gets hot and the kettle automatically switches off (2-3 minutes). |
| Expected results | The boiling process should complete in less than 4 minutes.  The water should get hot.  The kettle should automatically power off when the water gets too hot.  The kettle lid should stay closed. |

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| Test case #5 | **Boil tea/milk instead water** |
| Description | Check if the machine is working correctly with other liquids |
| Steps | 1. Fill 1 liter of tea/milk in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the water gets hot and the kettle automatically switches off (2-3 minutes). |
| Expected results | The boiling process should complete in less than 4 minutes.  The tea/milk should get hot.  The kettle should automatically power off when the tea/milk gets too hot.  The kettle lid should stay closed. |

### Test Scenario #5: Safety Tests

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| Test case #1 | **Check for electrical power at the kettle and base surface** |
| Description | Check for electricity at the kettle and base surface on each step |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. |
| Expected results | No electrical power at the kettle and base surface |

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| Test case #2 | **Check the button temperature** |
| Description | Check the power button temperature |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network. 3. Plug the boiler into the power base. 4. Switch on the kettle. |
| Expected results | The power button should not be hot. |

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| Test case #3 | **Test the kettle powered by +/- 10% of the typical voltage (220 V)** |
| Description | Check the kettle with different voltage |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network with +/-10% of the typical voltage 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the water gets hot and the kettle automatically switches off (2-3 minutes). |
| Expected results | The boiling process should complete in less than 4 minutes.  The kettle should automatically power off, shortly after start.  The kettle lid should stay closed. |

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| Test case #4 | **Little water in the base** |
| Description | Drop some drops of water over the base |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network with +/-10% of the typical voltage 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the water gets hot and the kettle automatically switches off (2-3 minutes). |
| Expected results | The boiling process should complete in less than 4 minutes.  The kettle should automatically power off, shortly after start.  The kettle lid should stay closed. |

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| Test case #5 | **Check cable get hot** |
| Description | Check cable get hot |
| Steps | 1. Fill 1 liter of cold water in the kettle and close the boiler lid. 2. Plug the power base in the electrical network with +/-10% of the typical voltage 3. Plug the boiler into the power base. 4. Switch on the kettle. 5. Wait until the water gets hot and the kettle automatically switches off (2-3 minutes). |
| Expected results | Cable should be not hot |

## Testing a Coffee Machine

### Test Scenario #1: Brew a Coffee

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| Test case #1 | **Brew a small coffee -> success** |
| Description | Start the coffee machine, put water, put ground coffee in the outlet, and brew a cup of coffee. |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew small coffee" button. 7. Wait until the brew process finishes. |
| Expected results | The brew process should complete in less than 50 seconds.  The coffee cup should hold a hot small coffee (60 ml).  The machine should stay powered on.  The "hot water" indicator light could be on or off (both states are correct).  The machine should have enough water in its water container (it should not beep). |

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| Test case #2 | **Brew a coffee with no water 🡪 fail** |
| Description | Start the coffee machine, empty the water container, try to brew a cup of coffee, expect the coffee machine to start beeping to indicate that the water is not enough. |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. Don`t fill the water container. 4. Put an empty coffee cup under the coffee outlet. 5. Press the "brew small coffee" button. 6. Wait until the machine start beeping to indicate that the water is not enough. |
| Expected results | The brew process should stop immediately  The machine should stay powered on  The "hot water" indicator light should be off. |

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| Test case #3 | **Brew a coffee long coffee 🡪 success** |
| Description | Start the coffee machine, put water, put ground coffee in the outlet, and brew a cup of coffee. |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew long coffee" button. 7. Wait until the brew process finishes. |
| Expected results | The brew process should complete in less than 50 seconds.  The coffee cup should hold a hot long coffee (120 ml).  The machine should stay powered on.  The "hot water" indicator light could be on or off (both states are correct).  The machine should have enough water in its water container (it should not beep). |

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| Test case #4 | **Brew coffee when the water is not enough** |
| Description | Start the coffee machine, fill the water container with water under the minimum, try to brew a cup of coffee, expect the coffee machine to start beeping to indicate that the water is not enough. |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container with little water (under the minimum). 4. Put an empty coffee cup under the coffee outlet. 5. Press the "brew small coffee" button. 6. Wait until the machine start beeping to indicate that the water is not enough |
| Expected results | The brew process should stop immediately  The machine should stay powered on  The "hot water" indicator light should be off. |

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| Test case #5 | **Brew a coffee when the water is not hot** |
| Description | Start the coffee machine, fill the water container, try to brew a cup of coffee, expect the cup to be filled with water. |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container. 4. Put an empty coffee cup under the coffee outlet. 5. Press the "brew small coffee" button. 6. Wait until the brew process finishes |
| Expected results | The brew process should complete in less than 50 seconds.  The coffee cup should hold a water (120 ml).  The machine should stay powered on.  The "hot water" indicator light could be on or off (both states are correct).  The machine should have enough water in its water container (it should not beep). |

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| Test case #6 | **Coffee outlet isn’t put correctly** |
| Description |  |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. **Put the coffee outlet incorrect** 4. Fill the water container to its max level. 5. Wait until the "hot water" indicator lights up. 6. Put an empty coffee cup under the coffee outlet. 7. Press the "brew small coffee" button. 8. Wait until the brew process finishes. |
| Expected results | The brew process should stop immediately (should not start).  The machine should stay powered on.  The "hot water" indicator light should be off |

### Test Scenario #2: Machine On/Off, Design, Look and Feel

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| Test case #1 | **Switch off 🡪 check light indicator** |
| Description | Check if the light indicator work when the machine is off |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Switch off the machine |
| Expected results | The light indicator should be off. |

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| Test case #2 | **Check the look and feel** |
| Description | Check the coffee machine, the power plug, the cables, etc. for obvious problem |
| Steps | 1. Check if the coffee machine is in working order 2. Check if the power plug is in working order 3. Check if the cables is in working order |
| Expected results | The coffee machine, the power plug, the cables should be in working order |

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| Test case #3 | **Check the water container for water leaks** |
| Description | Check the water container for water leaks. |
| Steps | 1. Fill the water container to its max level. 2. Check for water leaks. |
| Expected results | **No water leaks** from the water container. |

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| Test case #4 | **Check the time interval beeping** |
| Description | Check if the beeping interval is 10 seconds |
| Steps | 1. Power on the machine 2. Put ground coffee blend in the coffee outlet. 3. Don`t fill the water container. 4. Put an empty coffee cup under the coffee outlet. 5. Press the "brew small coffee" button. 6. Wait until the machine start beeping to indicate that the water is not enough. 7. **Check if the interval beeping is 10 seconds** |
| Expected results | The interval between the beeping to be 10 seconds. |

### Test Scenario #3: Extreme test

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| Test case #1 | **Power off (from the power plug) during the machine brew a coffee** |
| Description | Turn off the machine (from the power plug) during the machine brew a coffee |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew small coffee" button. 7. Power off(from the power plug) the machine during brew a coffee. |
| Expected results | The brew process should not be complete.  The coffee cup should hold a half full cup of coffee.  The "hot water" indicator light should be off.  The machine should not beep. |

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| Test case #2 | **Try to brew a tea instead coffee** |
| Description | Put tea leaves instead of ground coffee. |
| Steps | 1. Power on the machine. 2. Put tea leaves in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew small coffee" button. 7. Wait until the brew process finishes. |
| Expected results | The brew process should complete in less than 50 seconds.  The coffee cup should hold a hot tea (60 ml).  The machine should stay powered on.  The "hot water" indicator light could be on or off (both states are correct).  The machine should have enough water in its water container (it should not beep). |

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| Test case #3 | **low outside temperature** |
| Description | Check if the machine is working correctly at low temperatures outside |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew small coffee" button. 7. Wait until the brew process finishes. |
| Expected results | The boiling process should complete in less than 4 minutes.  The water should get hot.  The kettle should automatically power off when the water gets too hot.  The kettle lid should stay closed. |

### Test Scenario #4: Safety test

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| Test case #1 | **Check cable get hot** |
| Description | Check if the cable get hot |
| Steps | 1. Power on the machine. 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew small coffee" button. 7. Wait until the brew process finishes. |
| Expected results | Cable should be not hot |

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| Test case #2 | **Check for electrical power at the coffee machine surface** |
| Description | Check for electricity at the coffee machine surface on each step |
| Steps | 1. Power on the machine 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew small coffee" button. 7. Wait until the brew process finishes. |
| Expected results | No electrical power at the kettle and base surface |

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| Test case #3 | **Check the buttons temperature** |
| Description | Check if the buttons get hot, when we brew a coffee |
| Steps | 1. Power on the machine 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew small coffee" button. 7. Wait until the brew process finishes. |
| Expected results | Buttons get not hot |

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| Test case #4 | **Test the kettle powered by +/- 10% of the typical voltage (220 V)** |
| Description | Check the coffee machine with different voltage |
| Steps | 1. Power on the machine 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew small coffee" button. 7. Wait until the brew process finishes. |
| Expected results | The brew process should complete in less than 50 seconds.  The coffee cup should hold a hot small coffee (60 ml).  The machine should stay powered on.  The "hot water" indicator light could be on or off (both states are correct).  The machine should have enough water in its water container (it should not beep). |

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| Test case #5 | **Little water on the coffee machine** |
| Description | Check if we drop some water over the coffee machine |
| Steps | 1. Power on the machine 2. Put ground coffee blend in the coffee outlet. 3. Fill the water container to its max level. 4. Wait until the "hot water" indicator lights up. 5. Put an empty coffee cup under the coffee outlet. 6. Press the "brew small coffee" button. 7. Wait until the brew process finishes. |
| Expected results | The brew process should complete in less than 50 seconds.  The coffee cup should hold a hot small coffee (60 ml).  The machine should stay powered on.  The "hot water" indicator light could be on or off (both states are correct).  The machine should have enough water in its water container (it should not beep). |