# Homework: Software Quality Assurance Introduction

## Think Testing: Gas Station

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| **Problem #1** | Problem with the accumulator. |
| **Problem #2** | She is in the wrong car. |
| **Problem #3** | She may not have closed the fuel cap |
| **Problem #4** | Wrong fuel. |
| **Problem #5** | She may not have turned the key all the way to start the engine |
| **Problem #6** | She may not have closed the driver door or one of the passenger doors. |
| **Problem #7** | Тhe car's immobilizer may have failed |
| **Problem #8** | The key's battery may be dead |

## Think Testing: Tooth Brushing

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| **Step #1** | We take the toothbrush and remove the packaging |
| **Step #2** | Before the first use of the toothbrush, we wash it |
| **Step #3** | We open the toothpaste and apply toothpaste along the length of the brush where the bristles are located  Trivia Fun: The History of Toothbrushes and Toothpaste - City DentalPutting toothpaste on the brush   * Open the toothpaste by unscrewing its cap * We squeeze the tube of toothpaste at the back end, gently squeezing it to come out * Carefully place the paste on the bristles of the brush * Then we wet it again. |
| **Step #4** | How to Brush Your Teeth Better, Dowagiac Family Dentistry, MITooth brushing   * First, the front teeth are brushed in an up and down motion * Second, we continue with the outer side of the teeth, but now we rub the two back ends of the teeth with rotating movements * Thirdly, we open the mouth and begin to rub the teeth from the inside and from above * Fourth, we start with the upper and finally the lower teeth * Fifth, we make sure that we have scrubbed our teeth from all sides. * To make sure the teeth are properly brushed we scrub them for at least 3 minutes |
| **Step #5** | Mouthwash   * We spit out the contents of the paste from our mouth * Then we take a glass of water * Then we start gargling and rinsing the mouth with water from the toothpaste * We spit out the water |
| **Step #6** | Wash the brush with water and place it in a ventilated place |
| **Video** | Video of the process: [https://www.mouthhealthy.org/all-topics-a-z/brushing-your-teeth](https://www.mouthhealthy.org/all-topics-a-z/brushing-your-teeth/). |

## Think Testing: 5 Kg Bag

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| **Test #1** | **We look at the bag**  **We inspect the bag and check the following:**  • does it look like a bag (shopping bag)  • whether the bag is made of paper  • whether there are handles  • whether there is a bottom (is it not drilled) |
| **Test #2** | **We fill a few oranges**  **Steps**: We take the bag and fill it with some meduim-size oranges.  **Checks**:   * We lift the bag and check that the handles last. * We're checking to see if the apples have fallen out. * Remove the oranges → it should be easy. |
| **Test #3** | **We check with 5 kg of oranges**  **Steps:** We take the bag. We fill exactly 5 kg of oranges (we measure them beforehand on a scale).  **Checks:**  **•** We lift the bag and check if the handles hold.  • We carry the bag for 5 minutes, even shaking it and shaking it slightly, we run with it.  • We check whether the oranges have not fallen out.  • We check whether the bag is healthy (no holes, tears, etc.). |
| **Test #4** | **Overfill test: 8 kg. / 10 kg. / 12 kg. rice**  We overfill the bag (with more than 5 kg.) and run with it and check if it is strong afterwards and if the rice is inside. |
| **Test #5** | **Smell test**  We try to see if it smells. |
| **Test #6** | **Dropout stress**  We take an empty bag. We put 2 packages of rice of 1 kg each in it. We raise it to a height of 1 m above the floor. The floor must be parquet. We drop the bag. We're checking to see if she's healthy. There should be no tears or damage. |
| **Test #7** | Does the bag stain hands when worn |
| **Test #8** | Put frozen foods or very cold ones that cause condensation or can get the bag wet, will it tear |

## Login Form UX Problems

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| **Problem #1** | Wrong URL - the word “your” change to “my” s should be <https://my-wonderful-shop.com> |
| **Problem #2** | Wrong URL – “add-to-basket” change to “login-form”  shoud be <https://my-wonderful-shop.com/login-form> |
| **Problem #3** | Тhe password and username positions have been swapped. |
| **Problem #4** | Тhe” Lost your password?” option should be positioned better |
| **Problem #5** | The key [Log Out] has to be removed. It has no place in the log in form |
| **Problem #6** | The [Log Out] key can be replaced with [Sign Up] and positioned on one lane with [Log In] |

## Weather Forecast Bug

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| **Mistake** | Temperatures in the weather forecast are displayed in Fahrenheit, instead of Celsius.  Example: min temp: 46 degrees; max temp: 61 degrees 🡪 should be min 7.7; max 16  The developer **didn’t consider that the weather forecast temperatures come in °F**. |
| **Bug (location)** | The **bug in the code, which displays the temperature on the screen**. The temperature should be displayed in °C. It should be converted before displayed on the screen. |
| **Failure (symptoms)** | Temperatures are displayed wrongly in °F, instead of °C. When the temperature is displayed, it should be shown in °C, not in °F. |

## Age Checking Machine

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| The machine fails when the age is exactly 18. Fix:   * If **age >= 18**, then **print** "*Welcome to our bar. Enjoy!*" and the door opens.   The machine should also handle the case of “card cannot be read”. Fixed logic:   1. If **age cannot be read**, then print “Card / *age cannot be read*”. The door stays closed. 2. If **age > 0**, and **age < 18**, then **print** "*You are too young to visit our bar*". The door stays closed. 3. If **age >= 18**, then **print** "*Welcome to our bar. Enjoy!*" and the door opens. 4. **Otherwise**, **print** "*Invalid age. Please try again*". |

## Testing an Electric Water Kettle

### Test Scenario: Boil Water

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| Test case | **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. If is does not complete in 4 minutes, we should witch the kettle off and report a failing test.  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 | **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 (max 2 seconds). |
| Expected results | The process should complete in less than 2 seconds.  The kettle should automatically power off, shortly after the start.  The kettle lid should stay closed.  The kettle should stay not hot. |

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| Test case | **Measure the boiled water temperature** |
| Description | Measure the boiled water temperature 🡪 it should be 90 … 120 °C. |

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| Test case | **Boil not enough water 🡪 fail** |
| Description | Try to boil 150 ml water 🡪 the kettle should refuse to start. |

### Test Scenario: Look and Feel

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| Test case | **Check the look and feel** |
| Description | Check the kettle, the base, the power plug, the cables, etc. for obvious problems. |
| Steps | 1. We take the kettle and make a visual inspection of its condition 2. We take the base and make a visual inspection of its condition 3. We take the the power plug and make a visual inspection of its condition 4. We take the cables and make a visual inspection of its condition |
| Expected results | 1. Тhe kettle does not have a damaged cover, a broken button for switching on and for opening the lid. 2. Тhe base has no damaged cover, the power cable is visibly firmly attached to the base. 3. The plug is not damaged, the pins are parallel and not crooked and the cable is firmly attached to the electric plug 4. Тhe cable must not have tears or kinks |

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| Test case | **Check the kettle and base to match** |
| Description | Check if the kettle can be plugged correctly in the base. |
| Steps | 1. We fill the kettle with water 2. We place a kettle on the base 3. We plug the base into the electrical network 4. Switch on the kettle. |
| Expected results | 1. To boil the water. 2. Visible ideally, the bottom of the kettle rests on the surface of the base. 3. By placing a kettle on the base, it can only be released from it with an upward movement. |

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| Test case | **Check the kettle capacity** |
| Description | Check if the kettle capacity is 1 liter. |
| Steps | 1. We take a bottle with a capacity of 1 liter or a measuring jug on which have units of measurement written. 2. We fill the measuring jug with water right up to the measuring line for 1 liter. 3. Pour the entire contents of the measuring jug into the kettle. |
| Expected results | 1. All the contents of the measuring jug to collect in the kettle. 2. The water should be exactly on the max line of the kettle. |

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| Test case | **Check power consumption** |
| Description | Check if the kettle power consumption is ~ 1500 watt. |
| Steps | Use **Shelly Plug S** or other smart plug / wattmeter device to measure the power consumption: |
| Expected results | * **0** watts when **off**. * **1400-1600** watts when **on**. |

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| Test case | **Check for water leaks** |

### Test Scenario: Lid Test

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| Test case | **Open the lid** |

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| Test case | **Close the lid** |

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| Test case | **…** |

### Test Scenario: Extreme / Special Tests

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| Test case | **Boil ice cubes** |

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| Test case | **Boil tea, instead of water** |

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| Test case | **Power off (with the button) during boiling** |

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| Test case | **Power off (from the power plug) during boiling** |

### Test Scenario: Safety Tests

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| Test case | **Check for electrical power at the kettle and base surface** |

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| Test case | **Check the button temperature after boiling** |

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| Test case | **Test the kettle powered by +/- 10% of the typical voltage (220 V)** |

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| Test case | **Little water in the base** |

## Testing a Coffee Machine

### Test Scenario #1: …

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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. Empty the water container. 4. Wait until the "hot water" indicator lights up. 5. Press the "brew small coffee" or “brew long coffee” button. |
| Expected results | The coffee machine will to start beeping on intervals of 10 seconds that indicate that the water is not enough.  The machine should stay powered on.  The machine will not start brew process. |

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| Test case | **Brew a 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). |

### Test Scenario #2: …

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| Test case #1 | **Switch off 🡪 check light indicator** |
| Description | Start the coffee machine, put water, put ground coffee in the outlet, wait until the "hot water" indicator lights up. |
| 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. Turn off the machine. |
| Expected results | Hot water indicator lights should turn off.  The machine should power off |

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| Test case #2 | **Switch on with no water 🡪 beeping** |
| Description | Start the coffee machine, empty the water container, expect the coffee machine to start beeping to indicate that the water is not enough. |
| Steps | 1. Power on the machine. 2. Empty the water container. 3. Wait until the "hot water" indicator lights up. |
| Expected results | The coffee machine will to start beeping on intervals of 10 seconds that indicate that the water is not enough.  The machine should stay powered on. |