Manual Testing Tech Challenge

1. Create test cases for testing the functionality of a washing machine (a laundry one 😊).

Take into consideration multiple states of the washing machine and don’t forget about temperature/spin speed selection or any other cool feature your washing machine may have.

Write the steps of the test case along with the test data and the expected outcome in an A organized and readable format.

Please make sure you keep each test case at a reasonable length (as always: balance is key), taking into account real life scenarios.

2. If you had access to a bank's database, how would you use that information to design an ATM machine for elderly people?

3. What approach would you have to find a needle in a haystack?

4. In what ways would you like to create value as an intern?

Please provide your answers in English.

1. **Test cases for testing the functionality of a washing machine.**

**Testing scope:** The testing scope is to verify the functionality of the washing machine if it is working as expected and does not have any malfunction that can affect the user experience.

**Test plan:** We will include smoke testing, stress testing, connectivity testing and other functional tests covering the following requirements:

* The washing machine should be able to clean dirty clothes.
* As a user, I should be able to put detergent in the washing machine.
* As a user, I should be able to place the laundry inside the washing machine.
* As a user, I should be able to select the washing program (duration, temperature, RPM(Rotations per minute).
* The washing machine should be able to work as expected under stressful conditions. like: low/high electricity power, high/low water pressure, high/low mechanical force applied while being manipulated.
* The washing machine should have basic washing programs: quick wash, prewash, Standard cotton 40°C (Eco), Synthetic / Easy care 30°C, Eco 40-60, cotton 20 °C / Cold wash, Wool / Handwash, Cotton 30 °C, only dry.
* As a user, I should be able to add different types of clothes, cotton, synthetic, wool, footwear.
* The washing machine should be able to work as expected with a recommended weight of clothes. The load capacity is 10.5 kg and the drying capacity is 7 kg. An error message should alert the user when the washing machine is started with a small or high weight of clothes.
* The washing machine should have the following phases of the washing cycle: pre-rinse, main wash, main rinses, spinning and anti-crease.

**Smoke Testing**

1. **Test if the door is functional**

Check that the washing machine door through which the clothes are placed can be opened and closed.

**Preconditions:** none

**Steps:**

1. Open the washing machine door.
2. Close the washing machine door.

**Expected outcome:** The door is functional. It can be opened and closed.

**2. Test whether the detergent container is functional**

Verify whether the door of the container recipient can be opened and closed.

**Preconditions:** none

**Steps:**

1. Open the detergent container.
2. Put a cup of detergent.
3. Close the detergent container.

**Expected outcome:** The detergent container is functional, it can be open and close, and the user can add detergent.

**3. Test washing machine is cleaning the laundry**

Verify if the washing machine is working when it is connected to the power and water sources.

**Preconditions:** none

**Steps**:

1. Connect the washing machine to a power source and a water source.
2. Put some clothes into the washing machine and then close the door.
3. Select a program, for example, a quick wash program.
4. Press start button.

**Expected outcome:** The washing machine is working properly, the clothes are washed once the cleaning program is done.

**Connectivity testing**

1. **Test the functionality when the power source is turned off**

Verify if the washing machine is working when the power source is turned off

**Preconditions:** none

**Steps:**

1. Connect the washing machine to a water source.
2. Try to start the washing machine.

**Expected outcome:** The washing machine is not functional because the power source is turned off.

**2. Test the functionality of the washing machine with the water source off**

Verify if the washing machine is working when the water source is turned off.

**Preconditions:** none

**Steps:**

1. Connect the washing machine to a power source.
2. Select the rinsing program.
3. Press to start.

**Expected outcome:** An error message should alert the user that the water source is disconnected.

**3. The power source is interrupted during the washing program**

Test what happens if the power supply is suddenly turned off during the washing program.

**Preconditions:** The washing machine is connected to the power and the water source.

**Steps:**

1. Open the washing machine and add 2kg of clothes inside.
2. Select the Cotton 30 °C program and press start.
3. In the middle of the program, or after 25 min disconnects the power source of the washing machine.
4. Let the washing machine be disconnected for a few minutes.
5. Connect again to the power source.

**Expected outcome:** The washing machine is working properly with 2kg of clothes. The Cotton 30 °C program is working. The washing machine turns off when she is disconnected from the power source. After it is connected the washing machine should continue the cotton program from the moment she stays.

4. **The water source is interrupted during the washing program**

Test what happens if the water supply is suddenly turned off during the washing program.

**Preconditions:** The washing machine is connected to the power and the water source.

**Steps:**

1. Open the washing machine and add 6kg of clothes inside.
2. Select the synthetic program and press start.
3. In the middle of the program, or after 25 min disconnects the water source of the washing machine.
4. Let the washing machine be disconnected for a few minutes.
5. Connect again to the power source.

**Expected outcome:** The washing machine supports 6kg of clothes. The synthetic program is working. The washing machine alerts the user when she is disconnected from the water source and it stops working. After it is connected the washing machine should continue the synthetic program from the moment she stays.

**5. Test the automatic start functionality**

Verify if the washing machine can be scheduled to start a washing program after 6 h.

**Preconditions:** The washing machine is connected to the power and the water source.

The washing machine has automatic start functionality.

**Steps:**

1. Open the washing machine and put inside clothes.
2. Put detergent inside of the special container.
3. Select the program for delicates clothes.
4. Schedule to start a wash program after 6 hours.

**Expected outcome:** The washing machine can be scheduled to start after a period of 2h, 6h or 12h, and the washing machine starts the program after the selected time.

**Functional tests**

1. **Add detergent to the washing machine**

Verify if the detergent can be added to the special container from the left side of the washing machine

**Preconditions:** The washing machine is connected to power and water sources.

**Steps:**

1. Open the detergent container drawer.
2. Add a cup of detergent inside.
3. Close the detergent container drawer.

**Expected outcome:** The user is able to add detergent into the special container.

**2. Test if the detergent from the special container is correctly used by the washing machine**

**Preconditions:** The washing machine is power and water sources connected. The washing machine is full of clothes and the door is closed.

**Steps:**

1. Open the detergent container drawer and add a cup of detergent inside.
2. Select the temperature of 45 grades and select the normal wash program.
3. Press to start the washing program and observe if the detergent is used.

**Expected outcome:** The washing machine is working properly and the detergent is used in the main wash phase.

**3. Test the pre-rinse phase of a washing cycle**

Verify if the pre-rise cycle is working without detergents and if it can clean the light dirt.

**Preconditions**: Connect the washing machine to a power and water source.

**Steps:**

1. Select the short wash program which includes the pre-rise phase.
2. Add some T-shirts inside of the washing machine.
3. Press to start and observe what happens in the pre-rinse phase.

**Expected outcome:** The pre-rise cycle is offered as an additional option, it is carried out without detergents for taking out all kinds of loosely bound soils.

**4. Test the main wash phase of the washing cycle**

Verify if in the washing phase the detergent is taken from the special container and the clothes are washed with him.

**Preconditions**: The washing machine is connected to a power and water source. The Synthetic / Easy care 30°C program is available on the washing machine. The maxim capacity of clothes is 10,5kg for the washing program.

**Steps:**

1. Open the washing machine’s door and add 10,5 kg of synthetic clothes.
2. Put the indicated quantity of detergent inside the special container.
3. Press to start the Synthetic / Easy care 30°C program
4. Observe what happens in the main wash phase.

**Expected results**: In the main wash phase the detergent is taken from the special recipient and is mixed with the water and with the clothes from inside. The washing machine is working properly with the maximum amount of clothes.

5. **Test the main rinses phase of a washing cycle**

Verify if in the main rinses are 2 to 4 rinse phases and the clothes are rinsed properly.

**Preconditions:** The washing machine is connected to a power and water source. The Cotton 20 °C / Cold wash program is available on the washing machine.

Steps:

1. Open the washing machine’s door and add 1 kg of clothes.
2. Put the indicated quantity of detergent inside the special container.
3. Press to start the program and observe what happens in the main rinses phase.

**Expected outcome**: The cotton 20 °C / Cold wash program can be selected. In the main rinses phase are 2 to 4 rinse phases and different water levels; an additional rinse is carried out when, for example, there is too much foam in the drum.

6. **Test the spinning phase of the washing cycle**

Check if in the final spinning the water is extracted from the washing machine.

**Preconditions:** The washing machine is connected to a power and water source. The Wool / Hand wash program is available.

**Steps:**

1. Open the washing machine’s door and add 3 kg of wool clothes.
2. Put the indicated quantity of detergent inside the special container.
3. Press to start the program and observe what happens in the main wash phase.

**Expected outcome:** The Wool / Handwash can be selected and in this program, the spinning phase is available near the end of the washing program. In the spinning phase, all the water is extracted.

**7. Test the anti-crease phase of a washing cycle**

Verify if at the end of the anti-crease phase the clothes are squeezed of water.

**Preconditions:** The washing machine is connected to a power and water source. The cotton 40°C program is available. The detergent is ready in a special container.

**Steps:**

1. Open the washing machine’s door and add some cotton clothes.
2. Press to start and wait until the end of the program.
3. Observe if the clothes are squeezed of water.

**Expected outcome:** At the end of every programme, with exceptions like the wool programme, the drum usually continues to turn at intervals for up to 30 minutes to help prevent creasing (also known as wrinkling) and the clothes are squeezed of water. The door can be opened to remove the laundry at any time during the anti-crease phase.

**8. Test the quick wash program functionality**

Verify if the quick wash program will clean a full washing machine of clothes and verify if the time meets requirements - 30 min.

**Preconditions:** The washing machine is connected to power and water sources. 30 minutes lasts the quick wash program.

**Steps:**

1. Open the washing machine’s door.
2. Fill the washing machine with clothes and then close the door.
3. Select the temperature of 30 grades and select the quick wash program.
4. Press to start and wait until the end of the program.

**Expected outcome:** The temperature can be selected at the desired grade, also the program is working properly for 30 minutes and in the end, the clothes are clean on the quick wash program.

**9. Test the functionality of the “Standard cotton 40°C (Eco)” program**

Test if the standard cotton 40°C program is working and clean dirty cotton clothes.

**Preconditions:** The washing machine is connected to power and water sources. A water temperature monitoring device should be installed on the washing machine.

**Steps:**

1. Open the washing machine’s door and put inside cotton clothes.
2. Add detergent to the washing machine and close the door.
3. Select the standard cotton 40°C program and press to start.
4. Wait until the end and observe the water temperature and if the clothes are clean.

**Expected outcome:** The water temperature monitoring device should display the 40°C. In the end, the program works as expected and the clothes are clean.

**10. Test the Synthetic / Easy care 30°C program functionality**

Verify if the Synthetic/Easy care 30°C program is working at the default temperature and cleaning the dirty synthetic clothes.

**Preconditions:** The washing machine is connected to power and water sources. A water temperature monitoring device should be installed on the washing machine.

**Steps:**

1. Open the washing machine’s door and put inside synthetic clothes.
2. Add detergent to the washing machine and close the door.
3. Select the synthetic 30°C program and press to start.
4. Wait until the end and observe the water temperature and if the clothes are clean.

**Expected outcome:** The water temperature monitoring device should display the 30°C. In the end, the program works as expected and the clothes are clean.

**11. Test the drying clothes functionality**

Test if the clothes are drying well and the clothes can be used after this program.

**Preconditions:** The washing machine is connected to a power and water source and has the drying clothes functionality.

**Steps:**

1. Open the washing machine‘s door.
2. Put some clothes into the washing machine and select the Easy care 30°C program.
3. After finished the rinsing program select the drying program.

**Expected outcome:** The clothes are washed at the selected program. The clothes are ready to use after the drying program is finished.

**12. Leave the door of the washing machine open and start the washing program**

Test the behaviour when the washing machine’s door is open and the user tries to start a washing program.

**Preconditions:** The washing machine is power and water sources connected. The pre-wash program is available.

**Steps:**

1. Fill the washing machine with clothes.
2. Put detergent into the special container.
3. Select the desired program, for example, pre-wash and press to start.

**Expected outcome:** The user should not be able to start the washing machine if the door is open.

**13. Open the door during the washing program**

Check if the door can be opened during the washing program.

**Preconditions:** The washing machine is connected to the power and water source.

**Steps:**

1. Open the door and fill the washing machine with clothes.
2. Close the door.
3. Put the detergent into a special place for that.
4. Select a wash program Standard cotton 40°C (Eco) and press to start.
5. During the washing program try to open the door.

**Expected outcome:** The program Standard cotton 40°C (Eco) can be selected and the door should not be able to open during the washing program.

**14. Test cancel the program functionality**

Test what happens if the user selects a program, for example, the Quick wash program and then he wants to change it.

**Preconditions:** The washing machine is connected to the power and the water source.

**Steps:**

1. Put some clothes into the washing machine tub.
2. Close the door and select the quick wash program.
3. Press start.
4. Press to cancel and change the washing program.

**Expected outcome**: The cancel button is working and the program selected is stopped. The user can select another program.

**15. Test if the timer is working during the washing program**

Check if the timer is displayed on the front monitor and shows the remaining time of the program.

**Preconditions:** The washing machine is connected to the power and water sources, is ready for selecting the desired program and to be started.

**Steps:**

1. Select the hygiene + wash & dry program.
2. Put some clothes inside and close the door.
3. Press the start button and observe if the time is displayed correctly on the screen.

**Expected outcome:** The program is successfully selected. The timer is displayed on the monitor.

16. **Wash shoes into the washing machine.**

Test what happens if there are shoes in the washing machine?

**Preconditions:** The washing machine is connected to the power and the water source.

**Steps**:

1. Open the washing machine’s door.
2. Put inside a few pairs of shoes and close the door.
3. Select the quick wash program and press to start.

**Expected outcome:** The shoes can be washed with the selected program.

**17. Test empty washing machine functionality**

Test what happens if the washing machine is empty and the user presses to start a washing program.

**Precondition**: The washing machine has the Eco 40-60 program.

**Steps:**

1. Connect the washing machine to a power and water source.
2. Let the washing machine empty without anything inside.
3. Close the door.
4. Select the program Eco 40-60 and press start.

**Expected outcome:** An error message should alert the user that the washing machine is empty.

**Stress Testing**

1. **Stress test for the washing machine door**

Check what happens if the door is opened and closed at least 100 times in a row.

**Preconditions:** none

**Steps:**

1. Open and close the door at least 100 times in a row.

**Expected outcome:** The door is functional even if it is opened and closed many times.

**2. Close the washing machine by applying high mechanical force**

Test what happens if the washing machine door is closed with the greatest force.

**Preconditions**: The washing machine door is closed.

**Steps:**

1. Open the washing machine door.
2. Close the door with the greatest force.

**Expected outcome:** The door may have a malfunction if a maximum closing force is applied.

**3. Test a high energy load that overloads the washing machine**

Test the behaviour of the washing machine when it is running a washing program and a high energy load overloads it.

**Preconditions:** The washing machine is connected to the power and the water source. The washing machine is full of clothes and the door is closed. The rinsing program is available.

**Steps**:

1. Select program of washing, for e.g the rinsing program.
2. Close the washing machine’s door and press to start.
3. Turn off the power and reopen with more big intensity, for e.g 450 V.

**Expected outcome:** The washing machine is possible to burn out.

**4. Test the washing machine functionality with a low energy load**

Verify if the washing machine is working with a low energy load

**Preconditions:** The washing machine is connected to a low energy source and the water source. The washing machine is full of clothes and the door is closed. The quick washing program is available.

**Steps:**

1. Select program of washing, for e.g the quick washing program.
2. Close the washing machine’s door and press to start.

**Expected outcome:** The washing machine should alert the user that the energy is low and it cannot start.

**5. Test the energy consumption/ day**

Let us calculate the power consumption of the Bosch 7 kg Fully-Automatic Front Loading Washing Machine (WAK24168IN, Silver, Inbuilt Heater)Amazon and it operated 45 minutes per day.

**Preconditions:** The power of the washing machine is 2400 W and the capacity is 7 kg.

**Steps:**

1. Apply the power consumption formula *kWh = Wattage x operating minutes / 60,000*

**Expected outcome:** The energy consumption is 1,8 kWh/ day in this case.

**6. Test the speed spin**

Verify maximum speed spin with the help of the speed spin sensor.

**Preconditions:** The washing machine is connected to the power and the water source.

**Steps:**

1. Install the speed spin sensor.
2. Fill the washing machine with clothes and select the quick wash program.
3. Press to start the program.

**Expected outcome:** The speed spin sensor will register the maximum speed spin which is 1400 rpm for the washing machine with dryer LG F4DV710S1E.

**Conclusions:**

I created 31 test cases, smoke tests 3, connectivity testing 5, stress testing 6 and other functional tests 17.

The main functionalities that have been covered are: verifying the washing machine’s door functionality, test if the user can add clothes and detergent inside of the washing machine, test if the washing machine is working properly on the default programs and the clothes are clean at the end of the selected programs. Also, the scenarios in which was tested the behaviour of the washing machine in different situations: low/high electricity power, high/low water pressure, high/low mechanical force applied while being manipulated, the behaviour when the load capacity of clothes is the recommended one or not. One test for energy consumption and one for speed spin was created but it is not enough to decide that the washing machine works as required and don’t have critical bugs. The created test cases cover only a part of the washing machine functionality.

In my opinion, for test a washing machine, the details about the product and clear and concise requirements are mandatory because in this way you know what and how to test, what functionality or programs she has and most important what are the expected outcomes.

**II. If you had access to a bank's database, how would you use that information to design an ATM machine for elderly people?**

First of all, is it important if elderly people have any special needs? Like they are blind/deaf or need special assistance? Or have no special needs.

I would design an ATM that will show and explain written and verbal all the steps that a user needs to do. The text should be written in big font to help people with vision problems.

For example, when an elderly people want to use an ATM firstly he must insert the card, on the screen should be displayed the way to insert it with a photo, or with an animation that shows how the card should be inserted. A robot that explains aloud the way of insert the card (that it must be inserted in the special place with the magnetic tape down).

* After the card is introduced the user must enter the PIN and then press the “Confirm” button. After this operation, the user is searched into the bank’s database and if the PIN is correctly he is allowed to continue the desired process. Searching in the database the system should know the user nationality and the language should be set by default.
* The main options that the user have: cash withdrawal, interrogate sold, payment of invoices and PIN change.
* Also, I would design a HELP button if the elderly people are stuck at some step. This HELP button should offer to elderly people the possibility to talk with the bank consultant and resolve the problem.
* In the case of cash withdrawal, the ATM system should search in the database and doing an average of the amount withdrawn in the last 3 months and make an amount suggestion.
* Also, I would design an ATM that will scan the card, so elderly people won't be required to insert it in the machine and type the PIN code anytime they use it. In addition, I would implement a system with facial and voice recognition so that the holder of the account is always properly identified. With facial and voice recognition the user is found in the database and will allow access if he is the right person. This way, we can prevent theft, ATM skimming, etc. Moreover, once the card is scanned and the holder properly identified, they can do any transaction they wish (e.g. withdrawals, account balance checks) by voice recognition instead of typing the commands, which can be difficult and annoying for them given their age or impairments.

**III. What approach would you have to find a needle in a haystack?**

The handiest approach to find a needle in a haystack is using a big magnet and moving it through the haystack until it attracts the needle.

Another one is to throw the haystack in a pool of water and the needle will sink to the bottom of the needle is more important than the haystack.

Also, you can separate the haystack very well, if this is not so much, to find the needle. The last one is time-consuming.

**IV. In what ways would you like to create value as an intern?**

As an intern, I would like to assimilate as much information I can and learn more about testing in a prestigious company. I am thrilled to see how testing is done in the banking industry and learn from the top testers in this industry. The value I can create as an intern is to improve the testing processes & test plans. Also, as an intern, I would be able to add value by creating new test plans, test scenarios starting from the user behaviour. Taking the customer hat while testing a product it’s critical and I think I can create value by having this approach on testing. I’m a hard working person, always looking to learn new things, expand my area of expertise.

On the other side, I’m a sociable person, therefore I love to work in a team and I think this can be also considered as extra value points I can bring as an intern.