**Homework: Test Levels and Test Types**

* **Unit Testing in the Real Life: Testing a Battery**

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| **Test #1** | Take a **bulb 1.5V** and check if the battery works as expected: the bulb should light up after connection properly. |
| **Test #2** | Take **multimeter** and check the **voltage**.   * It should be ~ 1.5 volts. |
| **Test #3** | Take the battery and check it **visually**:   * Check its **length**. * Check its **diameter**. * Check if it has a form of **cylinder**. * Check for **leakage**, **corrosion**, etc. |
| **Test #4** | Check with a compatible **flashlight**. This will check two things:   * Whether battery size matches the flashlight. * Whether the batteries work as expected (light the bulb). |
| **Test #5** | Check the **labels** on the battery.   * The denoted size should be “AA”. * The denoted voltage should “1.5V”. |
| **Test #6** | Check if “**+**” and “**-**” are correctly positioned. Use a multimeter. |
| **Test #7** | Environmental test:   * Low temperature, e.g. 2 degree Celsius. * High temperature, e.g. 45 degree Celsius. |
| **Test #8** | Check the expiration date label. It should be in the future. |
| **Test #9** | Overheating test. |

* **Unit Testing in the Real Life: Testing a Light Bulb**

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| **Test #1** | Check the glass. Is it ok as expected. |
| **Test #2** | Check the metal part. Does it look ok as per the E10 standart. |
| **Test #3** | Check the internal lighting mechanism. Does it look ok. |
| **Test #4** | Check if the circuit can be closed with digital multimeter. |
| **Test #5** | Use external device as a test framework (like flashlight). Does it work with the light bulb. |

* **Unit Testing in the Software World: Age Checker**

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| **Tests** | * AgeChecker(0) child * AgeChecker(5) child * AgeChecker(12.99) child * AgeChecker(13) teenager * AgeChecker(19.5) teenager * AgeChecker(20) adult * AgeChecker(21) adult * AgeChecker(50) adult * AgeChecker(64.7) adult * AgeChecker(65) elder * AgeChecker(75.3) elder * AgeChecker(95) elder * AgeChecker(150) elder * AgeChecker(150.1) error * AgeChecker(15800) error * AgeChecker(-5) error * AgeChecker(-1) error * AgeChecker(“Peter”) error |

* **Unit Testing in the Software World: Income Checker**

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| **Test #1** | IncomeChecker(250) --> low |
| **Test #2** | IncomeChecker (1000) --> mid |
| **Test #3** | IncomeChecker(2300.70) --> mid |
| **Test #4** | IncomeChecker(7000) --> high |
| **Test #5** | IncomeChecker(-5) --> error |

* **Integration Testing in the Real Life: Lighting the Bulb**

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| **Test #1** | Implement the following circuit, using the provided components:    The bulb should light. |
| **Test #2** | Implement the following circuit, using the provided components:    **Switch on** the switch button the bulb should light. |
| **Test #3** | Implement the following circuit, using the provided components:    **Switch off** the switch button the bulb should **not light**. |

* **\* Integration Testing in the Software World: Credit Risk**

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| **Tests** | The following 12 tests cover each combination of age + income:   * CreditRisk(age: 5, income: 500) 100% * CreditRisk(age: 6, income: 2000) 100% * CreditRisk(age: 7, income: 6000) 100% * CreditRisk(age: 15, income: 700) 80% * CreditRisk(age: 15, income: 2000) 72% * CreditRisk(age: 17, income: 6700) 64%   Additional tests for invalid input:   * CreditRisk(age: -5, income: 500) error * CreditRisk(age: 6, income: -2000) error   Regression test:   * CreditRisk(age: 17, income: 0) 80% * Bug in the sample calculator: <http://softuni-qa-loadbalancer-2137572849.eu-north-1.elb.amazonaws.com/credit-risk/> * CreditRisk(age: 0, income: 1000) 100% * Bug in the sample calculator: <http://softuni-qa-loadbalancer-2137572849.eu-north-1.elb.amazonaws.com/credit-risk/> * CreditRisk(age: 0, income: 0) 100% |

I also found bug in the credit risk calculator: <http://softuni-qa-loadbalancer-2137572849.eu-north-1.elb.amazonaws.com/credit-risk/>

* When the age or income holds “0”, the messages under the “age” and “incomes” boxes are incorrect:



* There is a **UI bug**. When the screen is not big enough, the downside of the form gets cut. Also when we zoom-in / zoom-out, content may become missing:



* **System Testing in the Real Life: Flashlight**

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| **Test #1** | Test switch on / switch off the light.  We take the flashlight. Put new batteries correctly. Switch on the flashlight the bulb should light. Switch off the flashlight the bulb should light off. |
| **Test #2** | Test battery replacement |
| **Test #3** | Test bulb replacement |
| **Test #4** | Test battery duration. At least 1 hour of lighting with new batteries. |
| **Test #5** | Test the illumination distance. It should illuminate cleanly at distance of 30 meters or less (with new batteries). |
| **Test #6** | Shock resistance test: fall from the table and check if it still works correctly. |
| **Test #7** | Operation under high / low temperature |
| **Test #8** | Overheat test |
| **Test #9** | Water resistance test |

* **System Testing in the Real Life: Digital Scale**

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| **Test #1** | Test switch on / switch off button of the scale.  We take the scale. Put new batteries correctly. Switch on the scale and the display should light. Switch off the scale and the display should light off. |
| **Test #2** | Test battery replacement. |
| **Test #4** | Test battery duration with new batteries. |
| **Test #6** | Weight resistance test: Put big weight on the scale and check if it still works correctly. |
| **Test #7** | Check if the scale shows the correct kg on the display. |

* **System Testing in the Software World: Number Calculator**

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| **Test #1** | Calc(5, +, 3) 8  Test passed |
| **Test #2** | Calc(5, +, 0) 5  Test passed |
| **Test #3** | Calc(Infinity, +, 1) Infinity  Test passed |
| **Test #4** | Calc(-Infinity, +, 1) Infinity Test passed |
| **Test #5** | Calc(pesho, +, 1) invalid input Test passed |
| **Test #6** | Calc(1000000000000, +, 5) 1000000000005  Test failed! |

* **Acceptance Testing in the Real Life: Flashlight**

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| **Test #1** | The customer takes the flashlight, **switch on / off** the light, and assures it works. |
| **Test #2** | The customer checks the flash **illumination**. |
| **Test #3** | The customer checks how easy it is to **replace the batteries**. |

* **Acceptance Testing in the Real Life: Digital Scale**

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| **Test #1** | The customer takes the scale, **switch on / off**, and assures it works. |
| **Test #2** | The customer checks the weight that the display shows is correct. |
| **Test #3** | The customer checks how easy it is to **replace the batteries**. |

* **Acceptance Testing in the Software World: Number Calculator**

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| **Test #1** | The customer takes the calculator, **switch on / off**, and assures it works |
| **Test #2** | The customer checks the calculation that the display shows is correct. |
| **Test #3** | The customer checks how easy it is to **replace the batteries** |

* **Functional and Non-Functional Tests: Flashlight**

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| **Functional Tests** | **Non-Functional Tests** |
| With turned off flashlight, press the button and the flashlight turns on. | Turn on the flashlight. Leave it for one week. Check when it will turn off. |
| With turned on flashlight, press the button and the flashlight turns off. | How easy is to change the batteries. |
| Open the flashligth, change the batteries, close the flashlight. | The illumination distance should be cleanly at distance of 30 meters or less. |