Coursework Cover Sheet

Students should complete the input fields contained in this form and attach it in front of your formal assessment submission. All fields within this form are required. Please ensure that check boxes and radio buttons are appropriately selected. The last three questions are just for you to personally consider.

# Department and assessment information:

**School Name: School of Science**

**Assessment title:** Test-Driven Development of a Smart Building Controller Class

**Course Title:** BSc (Hons) Computing

**Module Title:** Software Development

**Module Code:** C02401

**Year of Study:** 2023

# Academic Misconduct / Plagiarism Declaration

By attaching this front cover sheet to my assessment I confirm and declare that **I am the sole author of this work**, except where otherwise acknowledged by appropriate referencing and citation, and that I have taken all reasonable skill and care to ensure that no other person has been able, or allowed, to copy this work in either paper or electronic form, and that prior to submission I have read, understood and followed the University regulations as outlined in the [Academic Integrity Policy and Procedure for Academic Misconduct](https://www.uclan.ac.uk/assets/student-contracts/2023-24/academic-integrity-policy-2324.pdf)

# Have you checked the following? This will help your assessment achievement.

I have applied the learning outcomes for this module

I have checked for Academic Integrity via Turn-it-in

I have followed the guidance in the Assessment Brief and have not used AI to boost my grade unfairly.

I have used references in accordance with instructions in the Assessment Brief

I have proofread my work for spelling, grammar and punctuation.

I have checked that the word count/size of this submissions accords with the guidance provided in the Assessment Brief.

# Well-being

We wish to support any student who is experiencing mitigating circumstances which prevents students from performing to the best of their ability when completing or submitting assignments. If you are experiencing such circumstances, then you may apply for Mitigating Circumstances**.** Wherever possible this must be done prior to handing in your assignment.

Do you need to apply for mitigating circumstances for this assignment No

Please refer to the [Mitigating Circumstances Policy](https://msuclanac.sharepoint.com/sites/CyprusStudentHub/SitePages/Mitigating-Circumstances.aspx)

# Questions you may wish to consider:

1. Have I allowed sufficient time to prepare this assessment? \_\_\_YES\_\_\_\_\_
2. Have I reflected on previous feedback and made improvements in accordance with advice? \_\_\_\_YES\_\_\_\_
3. What grade am I expecting? \_\_\_\_100\_\_\_\_

**Test-Driven Development (TDD) of a Smart Building Controller Class**

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# Overview of TDD

<Describe your **strategy**, i.e., how you approached this project, which **steps** you followed in developing your BuildingController.cs class, and what are the **benefits** and **challenges** of TDD, in general and in relation to your project specifically. Refer to **issues** you had to resolve and **troubleshooting** your performed.

Finally, write a paragraph about the **employability skills** related to TDD and list **job titles/roles** where these skills may be relevant/essential. Cite at least four (**3) academic references/books** which you have consulted to justify your arguments [250-350 words].>

<Fill-in the Table below with the missing information>

|  |  |  |
| --- | --- | --- |
| Level | Number of Tests | Number of Test Cases |
| Level 1 | 4 | 6 |
| Level 2 |  |  |
| Level 3 |  |  |
| Level 4 |  |  |
| Totals: |  |  |

# L1R1- First iteration of the RED-GREEN-REFACTOR cycle

## 2.1 RED state

<Describe how you went about to create your first test. Which part of the assignment brief did you consult (e.g., Class Diagram, State Transition Diagram, requirements, etc.)? Add you first test below and explain why you are in the RED state. Format all code using Courier New fonts, size 9. Also add a screenshot showing the Test Explorer with the failing test.>

## 2.1 GREEN state

<Describe what you did to go to the GREEN state. Provide (copy and paste) the code in your BuildingController.cs class **before** and **after** this change. Format all code using Courier New fonts, size 9. In your Test Explorer run the test again. Add a screenshot showing the Test Explorer with the passing test.>

## 2.1 REFACTOR state

<Describe what you did during REFACTOR state. Provide (copy and paste) the code in your BuildingController.cs class **before** and **after** refactoring. If no changes are needed, then explain why.>

# L2R3 – Level 2 RED-GREEN-REFACTOR cycle

## 3.1 RED state

<Describe how you went about to create a test for L2R3. Which part of the assignment brief did you consult (e.g., Class Diagram, State Transition Diagram, previous requirements, etc.)? Add you test below (copy and paste) and explain why you are in the RED state. Format all code using Courier New fonts, size 9. Also add a screenshot showing the Test Explorer with the failing test.>

## 3.2 GREEN state

<Describe what you did to go to the GREEN state. Provide (copy and paste) the code in your BuildingController.cs class **before** and **after** this change. Format all code using Courier New fonts, size 9. In your Test Explorer run the test again. Add a screenshot showing the Test Explorer with the passing test.>

## 3.3 REFACTOR state

<Describe what you did during REFACTOR stage. Provide (copy and paste) the code in your BuildingController.cs class **before** and **after** refactoring.>

# L3Rx- Level 3 RED-GREEN-REFACTOR cycle

## 4.1 RED state

<Choose any Level 3 Requirement. State its id in the heading above (replace ‘x’). Describe how you went about to create one or more tests for your selected requirement. Which part of the assignment brief did you consult (e.g., Class Diagram, State Transition Diagram, previous requirements, etc.)? Add you test below (copy and paste) and explain why you are in the RED state. Format all code using Courier New fonts, size 9. Also add a screenshot showing the Test Explorer with the failing test(s).>

## 4.2 GREEN state

<Describe what you did to go to the GREEN state. Provide (copy and paste) the code in your BuildingController.cs class **before** and **after** this change. In your Test Explorer run the test again. Format all code using Courier New fonts, size 9. Add a screenshot showing the Test Explorer with the passing test(s).>

## 4.3 REFACTOR state

<Describe what you did during REFACTOR stage. Provide (copy and paste) the code in your BuildingController.cs class **before** and **after** refactoring.>

# L4Rx- Level 4 RED-GREEN-REFACTOR cycle

## 5.1 RED state

<Choose any Level 4 Requirement. State its id in the heading above (replace ‘x’). Describe how you went about to create one or more tests for your selected requirement. Which part of the assignment brief did you consult (e.g., Class Diagram, State Transition Diagram, previous requirements, etc.)? Add you test below (copy and paste) and explain why you are in the RED state. Also add a screenshot showing the Test Explorer with the failing test(s).>

## 5.2 GREEN state

<Describe what you did to go to the GREEN state. Provide (copy and paste) the code in your BuildingController.cs class **before** and **after** this change. In your Test Explorer run the test again. Add a screenshot showing the Test Explorer with the passing test(s).>

## 5.3 REFACTOR state

<Describe what you did during REFACTOR stage. Provide (copy and paste) the code in your BuildingController.cs class **before** and **after** refactoring.>

# STD – Valid States and Valid Transitions

<Provide your final code showing your implementation of the State Transition Diagram (STD). In addition to the in-line comments in your code, describe your algorithm and how you translated the STD into a test and then into code.>

# Stubs and Mocks

<Describe in your own words and giving examples from your solution, what is the purpose of stubs, what is the purpose of mocks and what their differences are. Provide screenshots to support your description.>

# Lessons Learned and Conclusion

<Describe what you have learned by working on this TDD project, and explain what you would do differently next time you have a similar task. Give specific examples of things you would change or skills and capabilities you developed by working on this project.>

<after hen you have finished adding your text in the sections above, remember to go to Table of Contents and update the entire table!>

# References

<Use Harvard Referencing style>