|  |  |
| --- | --- |
| Last Name |  |
| First Name |  |

**This assignment aims to help you consolidate the knowledge gained in the CSD2 Module 2, Tutorials 1 and 2. The assignment is structured in two parts:**

1. **The Write-Up section, to be submitted through this document**
2. **The Coding section, to be submitted as a Jupyter Notebook file**

**The two sections should be submitted as a zipped archive, named as follows:**

**Assignment1\_StudentSurname\_StudentName\_CSD2-2022.zip**

**Question:**

Now you have fabricated all your voussoirs. You have a cargo van which can carry a maximum of 900 kg in one turn. It is your task to transport all your pieces from the factory to the site. How many transportation turns do you need?

**Steps:**

1. Break the question down by initially checking the first turn. You want to put as many voussoirs as possible on the truck, for maximum efficiency. Pick one voussoir. If the truck's load capacity is not filled, the voussoir can be placed in the truck. You can repeat the process until the truck is full **or** you have checked all the voussoirs and no one fits the truck anymore.
2. Create a function that checks how many voussoirs can be loaded in one turn.
3. Calling the function until all the voussoirs are on the truck. Note: every time we reach the truck's capacity, we need to update the remaining voussoir list.

**Task 1**. **Describe the problem by means of text**

1. **Text Step 1:** Succinctly describe Step 1 in solving the problem through a paragraph of text of no more than 50 words. The text should describe the procedural steps you need to take to solve the problem.

*Your text …*

1. **Text Step 2:** Succinctly describe Step 2 in solving the problem through a paragraph of text of no more than 25 words. The text should describe the procedural steps you need to take to solve the problem.

*Your text …*

1. **Text Step 3:** Succinctly describe Step 3 in solving the problem through a paragraph of text of no more than 25 words. The text should describe the procedural steps you need to take to solve the problem.

*Your text …*

**Task 2**. **Draw Flowchart**

1. Flowchart **Step 1**: Draw a Flowchart encapsulating the most important steps identified to complete **Step 1** in the text above. Use Flowchart-specific symbols and notations to complete the task.

|  |
| --- |
| Paste / Insert Image of the Flowchart in response to Task2 A |

1. Flowchart **Step 2**: Draw a Flowchart encapsulating the most important steps identified to complete **Step 2** in the text above. Use Flowchart-specific symbols and notations to complete the task.

|  |
| --- |
| Paste / Insert Image of the Flowchart in response to Task2 B |

**Task 3**. **Pseudocode**

Convert your flowchart for Step 1 to **pseudocode**, a plain-English version of the flowchart.

Use Python **comments**, which start with a # symbol and will not be executed when we run the code. Type the comments considering that Python uses four-space indentation to organize code.

*Your pseudocode …*

**Task 4**. **Python Code**

Convert your **pseudocode** to Python code.

Hints:

1. Write your code directly in a Jupyter Notebook code cell. This will check any syntax issues.
2. Keep the pseudocode comments inside the code to help you organize your development
3. Once the code executes, paste a screenshot of the Jupyter Notebook Code cell in the space provided, below.
4. Code **Step 1**: Paste the initial check, for one voussoir, code below

|  |
| --- |
| **Paste screenshot of Jupyter Notebook Code cell** |

1. Code **Step 2**: Turn the first check into a function. For example, you could encapsulate the previous code into a function called **check\_left\_voussoirs**. Paste the code below.

|  |
| --- |
| **Paste screenshot of Jupyter Notebook Code cell**  **Use the template included in the Jupyter notebook that corresponds to this assignment** |

Code **Step 3**: Paste the complete code below

|  |
| --- |
| **Paste screenshot of Jupyter Notebook Code cell** |

**Task 5**. **How would you further automate the process:**

Would it be possible to further automate the process?

1. What element of an algorithm would you use to further automate the process. Write your answer in plain text. (Use no more than 25 words)?

*Your answer …*

1. How would this element be used? Write your answer in plain text. (Use no more than 25 words)?

*Your answer …*