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| **Unit Code/s & Name/s** | ICTPRG405 Automate processes | | | |
| **Assessment Type** | Portfolio | | | |
| **Assessment Name** | Python programming project | **Assessment Task No.** | | AT1 Part 2 |
| **Assessment Due Date** | Sunday 21st August 2022 | **Date submitted** | | 20/08/22 |

# Task 2: Encrypting the Converted Text

Now that we can convert the text entered by the user into a form which can be encrypted by the Caesar cipher, it is time to write a function to do this.

We need a function which takes as input the shift value and the string of text that has been converted. It will return a new string of text which has been encrypted by the Caesar cipher.

This is all I’m going to give you as the API for this function. It is up to you to specify more exactly what the API (*contract*) is that this function provides.

### Step 1: Pseudo-Code for This Function

You will design the algorithm for this function in pseudo-code, i.e. semi-English. The algorithm must have these properties:

* it must be guaranteed to stop and return a string regardless of the argument it is given
* it must obey the API contract defined above regardless of the argument it is given
* it must not crash or do unexpected things regardless of the argument it is given
* the algorithm must be written in simple enough steps that it can be translated into a computer language like Python
* the algorithm must be exact and well-defined, i.e. not open to interpretation

You will use English words like “if”, “while” and “for” where they are suitable. These make sense to an English reader, but they also indicate programming structures such as sequence, selection and iteration to a programmer.

Algorithm

1. create a list of uppercase alphabet characters
2. get the prepared text and save it as a variable userInput
3. a. get the users requested shift number and save it as a variable

b. ensure that the shift value is an integer and is modulus 26

c. if the shift value is not an integer, print an error and ask for a new value

1. define a function that encrypts user input based on the shift value entered
2. return the encrypted text as a print function

Diagram

Description automatically generated

Performance Criteria

1.1 Develop an algorithm that is an exact and sufficient description of the solution

1.2 Develop an algorithm that takes account of all possible situations

1.3 Develop an algorithm that is guaranteed to end

2.1 Use structures, sequence, selection and iteration

2.2 Use structures to describe algorithmic solutions to a problem

3.1 Create an abstract design, to fulfil the requirements of the proposed process`

### Step 2: Write Tests for the Function

To prove that your algorithm is correct, you will write a set of at least 10 test cases for your function. Each test case consists of four things:

* the input shift value
* the input string to the function
* what should be the output string from the function
* any comment about this test case

Here are three example test cases. You have to write another 10 test cases:

|  |  |  |  |
| --- | --- | --- | --- |
| Input Shift | Input string | Output String | Comment |
| 3 | TESTTHISFUNCTION | WHVWWKLVIXQFWLRQ | Encryption |
| -3 | WHVWWKLVIXQFWLRQ | TESTTHISFUNCTION | Decryption |
| 13 | PIANOSTOOL | CVNABFGBBY | ROT-13 |

\*\*\* The python program for the tests are included in a separate file called task2tests.py

|  |  |  |  |
| --- | --- | --- | --- |
| **SHIFT** | **INPUT STRING** | **OUTPUT STRING** | **COMMENT** |
| 1 | WHATSDOINMATE | XIBUTEPJONBUF | Encryption |
| -1 | XIBUTEPJONBUF | WHATSDOINMATE | Decryption |
| 3 | ILOSTGAMBLING | LORVWJDPEOLQJ | Encryption |
| -3 | LORVWJDPEOLQJ | ILOSTGAMBLING | Decryption |
| 13 | YOULOSTGAMBLING | LBHYBFGTNZOYVAT | ROT-13 |
| -13 | LBHYBFGTNZOYVAT | YOULOSTGAMBLING | ROT-13 |
| 27 % 26 | YESIMSOFCKINANGRY | ZFTJNTPGDLJOBOHSZ | Encryption with modulus |
| -27 %26 | ZFTJNTPGDLJOBOHSZ | YESIMSOFCKINANGRY | Decryption with modulus |
| 1234567890  %26 | THEKINDTHATLIKESTOMAKESUREHISMATESLEARNTHIERLESSONSWLLSONOWYOULOULOSTSIXHUNDREDDOLLARSGAMBLING | DROUSXNDRKDVSUOCDYWKUOCEBORSCWKDOCVOKBXDRSOBVOCCYXCGVVCYXYGIYEVYEVYCDCSHREXNBONNYVVKBCQKWLVSXQ | Testing modulus with large shift value and longer string |
| -1234567890  %26 | DROUSXNDRKDVSUOCDYWKUOCEBORSCWKDOCVOKBXDRSOBVOCCYXCGVVCYXYGIYEVYEVYCDCSHREXNBONNYVVKBCQKWLVSXQ | THEKINDTHATLIKESTOMAKESUREHISMATESLEARNTHIERLESSONSWLLSONOWYOULOULOSTSIXHUNDREDDOLLARSGAMBLING | Testing modulus with large shift value and longer string |