2

a) It is to ensure data integrity when being transferred.

b) There are multiple of getting a number with the same second digit when added together. This increase the chances of error when using it. If the data switches position whilst being transferred the error won’t be detected.

c) Modulus 11

First we assign each of the digits an index value, though we make sure to start with 2 as the first one is going to be reserved for the check digit. Multiply the digit with the index position.

Then sum all of the results and Mod it by the total number of digits that you have.

Then the Mod result should be subtracted from the total number of digits used in the input to get the check digit and insert it into the rightmost side of the number.

Notes

Stacks use the LIFO structure, last-in is the first-out. Two pointers are used, the base pointer and the top pointer. The base pointer is for the very first item whilst the top pointer is for the latest entry into the stack, if both the pointers are equal to each other then there can only be one item in the stack.

Push means to add data into the stack whilst pop is remove. (Push and Pull in Git)

Setting up a stack (Pseudocode)

DECLARE stack ARRAY[1:10] OF INTEGER

DECLARE topPointer : INTEGER

DECLARE basePointer : INTEGER

basePointer 🡨 1

topPointer 🡨 0

stickful 🡨 10

Exam Style Question

Data1 1

Data2

|  |  |
| --- | --- |
| Memory location | Value |
| 506 |  |
| 505 |  |
| 504 |  |
| 503 | XXX |
| 502 | ZZZ |
| 501 | NNN |
| 500 | PPP |

|  |  |
| --- | --- |
| Variable | Input |
| Data1 | WWW |
| Data2 | \*\*YYYAAA |

b) i) Creates a backup of the data so that another stack can be regenerated incase the original is lost.

\*\* removal for YYY