**Assignment 5 Q2**

A department store operates its own computerized credit system by issuing privileged customers with credit cards against which purchases can be charged, up to the customer’s credit limit.

Each credit card has a five-digit account number, for example

3475D

where D is a modulus-eleven check-digit for the account number.

(a) Describe an algorithm which is suitable for a routine which checks whether the credit card number is valid.

[6]

(b) Using your algorithm, calculate the value of D.

[1]

**Solution:**

def check(input):  
 sum = 0  
 for i in range(1, 5):  
 sum += (i+1) \* int(input[-i]) # Weight times digit, going backwards  
 output = 11 - sum%11  
 if output == 11:  
 output = 0  
 elif output == 10:  
 output = 'X'  
 return str(output)

First calculate the sum of the 5th last number to the 2nd last number, by multiplying each number to a weight that decreases from 5th last number to the 2nd last number by 1 each time, starting from 5. After calculating the sum, use the sum to divide by 11 and get the remainder. Then use 11 minus the remainder to get the result. If the result is 11, the check digit is 0, if the result is 10, the check digit is 10. Else, the check digit is just the result.

D is 4