**11DTP**

**Worksheet on programming**

For each of the following questions, create a plan for the solution, with test data and a testing plan.

Then code your solution into Scratch, keeping a record of the process with a plan\_to\_code document

1. a) For a particular house, input the length and breadth of a number of rooms. Input is terminated by entering 0 for the length. Calculate the area of each room as well as the total area for all the rooms.

Calculate the cost of carpeting for the house as follows. If the total area exceeds 100 square metres, carpet costs $100 per square metre, else the cost of carpeting is $115 per square metre.

Derive an algorithm for a program to do the above calculations.

b) Modify the algorithm to determine the carpeting for any number of houses

1. a) Write a program that will do the following for each customer: For each item bought, the data entered is a code and a price. The codes used are: F (Food), C (Clothing), and H(Hardware).

A code of T is used to end the purchase for the client.

Construct an algorithm that will determine how much is bought for each of the codes F, C and H, and will also print out the Total for all the purchases.

For example, if the input is F, 3.50, C, 67.90, F, 43.35, H, 123.90, F, 59.50, T

Then the output is:

Food: 106.35

Clothing: 67.90

Hardware: 123.90

Total: 298.15

b) Modify the program so that any number of customers can have their purchase slips printed (Merit)

c) Further modify the program so that if the customer buys hardware for more than $100 as well as food for more than $75 then they get a 15% fuel voucher (Excellence)

1. Account numbers (of for example, bank, clothing and other accounts) normally consist of a number of digits, of which the last digit is usually a check digit. These check digits are calculated in a number of ways.
2. Write an algorithm that will use a loop to enter the 8 digits of an account number. The sum of the first 7 digits must be determined and the remainder if the sum is divided by 9 must be determined. If this remainder is equal to the 8th digit (the check digit) then the account number is valid, else it is invalid.

For example: account number 23456138 has 2+3+4+5+6+1+3= 24.

24/ 9 gives a remainder of 6.

6 is not equal to 8 (the last digit) therefore the account number is invalid.

(A valid number would be 23456136)

1. Modify the algorithm to be able to enter any number of 8 digit account numbers