SOFT6018   
PROBLEM SOLVING & PROGRAMMING 1

# Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Student ID: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Date: 16th December 2014

# Contribution to Final Mark: 50%

# Examiners: M. Davin, H. Fagan, C. McGuane, D. Murphy, L. O'Sullivan

# Part 1: 25%

Write an application to ask for

* the **description** of an item
* the **price** of the item excluding VAT
* a **category** for the item
  1. fruit and veg
  2. dairy
  3. confectionery

The application should display the description of the item, the price excluding VAT, the VAT applied and the price including VAT.

The VAT rates are

* Fruit and veg 0%
* Dairy 10%
* Confectionery 20%

**Sample run 1**

What is the item? Bag of Apples

What is the price excluding VAT? 1.20

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

1

Bag of Apples: €1.2(ex VAT) + €0.0(VAT) = €1.2(inc VAT)

**Sample run 2**

What is the item? Maltesers

What is the price excluding VAT? 0.79

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

3

Maltesers: €0.79(ex VAT) + €0.158(VAT) = €0.948(inc VAT)

# Part 2: 30%

Adjust the code to read details of **multiple** items and display the items **in categories**.

Use ***any*** ***method*** you wish for multiple inputs – this sample run uses the "Ask the question" method.

What is the item? Apples

What is the price excluding VAT? 1.20

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

1

Apples: €1.2(ex VAT) + €0.0(VAT)= €1.2(inc VAT)

Do you have more items? Y

What is the item? Oranges

What is the price excluding VAT? 1.10

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

1

Oranges: €1.1(ex VAT) + €0.0(VAT)= €1.1(inc VAT)

Do you have more items? Y

What is the item? Maltesers

What is the price excluding VAT? 0.79

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

3

Maltesers: €0.79(ex VAT) + €0.158(VAT)= €0.948(inc VAT)

Do you have more items? Y

What is the item? Milk 1 litre

What is the price excluding VAT? 0.89

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

2

Milk 1 litre: €0.89(ex VAT) + €0.089(VAT)= €0.979(inc VAT)

Do you have more items? n

Fruit and Veg

Apples: €1.2(ex VAT) + €0.0(VAT)= €1.2(inc VAT)

Oranges: €1.1(ex VAT) + €0.0(VAT)= €1.1(inc VAT)

Dairy

Milk 1 litre: €0.89(ex VAT) + €0.089 (VAT)= €0.979(inc VAT)

Confectionery

Maltesers: €0.79(ex VAT) + €0.158 (VAT)= €0.948 (inc VAT)

# Part 3 25%

Add code to

1. Calculate and display the total cost of all items bought (including VAT)
2. Calculate and display the average cost per item (including VAT)
3. Calculate and display the most expensive item bought (including VAT) and its category.

For the input from Part 3 the output can be

You have spent €4.227 in total.

You have spent an average of €1.05675 per item.

Most expensive item(s): Apples in Fruit and Veg

# Part 4 20%

You have been asked to modify the code to carry out the following input data validation

1. Ensure the item's description has at least 3 characters.
2. Ensure the choice of category is between 1 and 3.
3. Ensure the price is a valid number.

A sample run can be

What is the item?

Ba

What is the item?

tt

What is the item?

Bananas

What is the price excluding VAT?

one

What is the price excluding VAT?

-2.20

What is the price excluding VAT?

1.20

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

4

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

-1

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

four

What is the category?

1: Fruit and Veg

2: Dairy

3: Confectionery

1

Bananas: €1.2(ex VAT) + €0.0(VAT) = €1.2(inc. VAT)