**Worksheet 4: Writing algorithms**

**Task 1**

Here is some sample pseudocode. Use this as a guide to write pseudocode algorithms for the descriptions in the questions below.

**input PIN**

**if *correct PIN entered* then**

**unlock phone**

**else**

**print "Try again"**

**endif**

1. Read in a student’s mark and print ‘pass’ or ‘fail’ depending on their mark. The pass mark is 40 or more.

Input mark

If mark >= 40

Print ”pass”

else

print”fail”

endif

2. To print the correct hat size based on the circumference of your head:

* Less than 57cm = Small
* Greater than 60cm = Large
* Anything in between = Medium

Input head\_circumference

If head\_circumference < 57

Hat\_size = “small”

Elseif head\_circumference > 60

Hat\_size = “large”

Else

Hat\_size = “medium”

Print Hat\_size

3. For a program that will:

* Read in the price of an item and the quantity purchased.
* Calculate the total spend.
* If the total spend is £50 or more, the customer will be given a discount of 10%. Calculate the discount if due.
* If applicable, display a message saying they qualify for a discount and the discount amount.
* Output the amount to pay, (deduct any discount due if applicable to the total spend)

Here is an example where discount is applicable

Item Price: £6, quantity purchased: 10

Total Spend : £60

Discount : £6 (10% of £60)

Amount to pay : £54

Input item\_price

Input quantity

Total\_spend = item\_price \* quantity

If Total\_spend >= 50

Print”10% discount applied”

Total\_spend = 10% of Total\_spend

Print”payment is now “+Total\_spend

Else

Print”payment is ”+Total\_spend

**Task 2**

For this task you need to access the programs **SeasonFinderBUGS.py** and **TaxCalculatorBUGS.py.** Both programs have errors in them.

1. **SeasonFinderBUGS.py** is a program that takes in the month of the year and outputs the season that month occurs in eg input → January, Output → Winter.

There are **four** errors in the code.

* What type of errors are these?
* Can you identify the errors and correct the code?

A missing double == invalid syntax,incorrect month variable no variable called Month,Print is used rather than print which is invalid syntax,

1. **L4 WS4 TaxCalculatorBUGS.py** is a tax calculator program that will calculate how much tax is to be paid by an individual. The rules are:

* Salary is 30,000 or less, tax is 20% of salary
* Salary is over 30,000, tax is 20% for first 30,000 and 40% for anything over

Example of tax calculation:

|  |  |  |  |
| --- | --- | --- | --- |
| **Salary bracket** | **Tax rate** | **Example salary** | **Tax calculation** |
| <=30,000 | 20% | 25,000 | 25,000 \*20% = 5,000 |
| > 30,000 | 20% on first 30,000  40% for remaining | 100,000 | 30,000 x 20% = 6,000  70,000 x 40% = 28,000  total tax = 34,000 |

* The program has **five** errors in it. Can you identify and correct the errors?
* Which of the three types of errors you have learnt about in the lesson is **NOT** found in this program?

Salry is not a variable which is defined,no : after first if invalid syntax,there I an extra bracket when asking for Salary invalid syntax,added statement for 45% tax not in requirements,part of code is not indented indentation expected,also the part for taxes for 30 00 for big qunatities is missing not in requirements