Assignment 2

Overview

This is an individual assignment that requires you to design, develop and test a small text-based program

Timelines and Expectations

Percentage Value of Task: 20%

Due: 5 pm Friday Week 11

Minimum time expectation: 20 hours

Learning Outcomes Assessed

The following course learning outcomes are assessed by completing this assessment:

Knowledge:

K1. Identify and use the correct syntax of a common programming language.

K2. Recall and use typical programming constructs to design and implement simple software solutions.

K3. Reproduce and adapt commonly used basic algorithms

Skills:

S1. Utilise pseudocode and/or algorithms as a major program design technique.

S2. Write and implement a solution algorithm using basic programming constructs.

S3. Demonstrate debugging and testing skills whilst writing code

Application of knowledge and skills:

A1. Develop self-reliance and judgement in adapting algorithms to diverse contexts.

A2. Design and write program solutions to identified problems using accepted design constructs.

Assessment Details

You work for the Australian Tax Office (ATO) and it's time to audit the Tooth Fairy. The Tooth Fairy has submitted a CSV file with the details of all the tooth pickups this year (see addresses.csv file in Moodle).

The assignment is broken up into three main components:

1) Design **pseudocode** to analyse the CSV file
2) Create an **activity chart** which illustrates the behavior of the pseudocode
3) Create a **program** based on the pseudocode and activity chart diagram

Your submission should consist of two files: a Word document containing the design pseudo-code and activity chart and a Python file (script) which is the final program.

The CSV File

You will need to download the addresses.csv file from Moodle. The file contains 500 records across seven columns. Here's a sample of the file and the type of information that it stores.

First Name	Surname	Street Address	Suburb	State	Postcode	Total number of teeth lost
Rebbecca	Didio	171 E 24th St	Leith	TAS	7315	8
Stevie	Hallo	22222 Acoma St	Proston	QLD	4613	2
Mariko	Stayer	534 Schoenborn St #51	Hamel	WA	6215	16
Gerardo	Woodka	69206 Jackson Ave	Talmalmo	NSW	2640	20

Part 1: Design

This stage requires you to prepare documentation that describes the functionality of the pseudocode and how it is to be tested. There is no coding or code testing involved in this stage.

Requirements:

1) Read all of this assignment sheet first!!!
2) Write pseudocode that describes how the program will operate.
    a. All program requirements must be included, even if you do not end up including all these requirements in your program code.
    b. The algorithm must be structured logically so that it will function correctly.
3) Write five test cases that ensure your program operates correctly

Add everything to your Word document.

Part 2: Activity Flowchart

Using either the online website https://draw.io (preferred), or the applications Visio or PowerPoint – create an activity diagram of how the program should operate.

Make sure to use the correct symbols in your diagram for starting, processes, decisions/branches, and ending the process.

Once you have completed your activity flowchart, add it to your Word document.

Part 3: Computer Program

You are free to design and implement the program however you see fit. Here are some requirements that must be incorporated into your program.

1. You must display a welcome message when the program starts. At a minimum, this message should contain the name of your program, the name of the program developer and your student ID.
2. Your program should have a text menu that allows the user to
    a. Print the following statistics
        i. Total number of children in the text file
        ii. Average number of teeth claims over the years
        iii. Number of children who have never lost a tooth
        iv. Number of children who have lost all their baby teeth
        v. Total expenditure for this year given the following:

Number of teeth lost	Amount
0	-
1	$1.00
More than 1	$0.50

    b. Print to a new file, a list of children who haven't lost any teeth. The user should be given the chance to enter a filename.
    c. Display a graph showing the number of claims per State
    d. Display a graph comparing the overall average number of teeth lost for two given States
3. To help with the readability of your code, you should use functions

A screenshot of a sample program is included in Appendix 1.

Finally, you should use your five test cases and demonstrate if they pass/fail and the reasons. Add your written response to the word document.

Submission

Your Word document and program code should be zipped into a single file (a .zip file) and loaded into the Assignment Box provided in Moodle by the due date and time. The naming conventions for the zip file are:

ITECH1400_Assignment_2_<YOUR-NAME>_<YOUR-STUDENT-ID>.zip

Obviously replace <YOUR-NAME> and <YOUR-STUDENT-ID) with your own personal details!

Assignments will be marked on the basis of fulfilment of the requirements and the quality of the work. In addition to the marking criteria, marks may be deducted for failure to comply with the assignment requirements, including (but not limited to):

- Incomplete implementation(s)
- Incomplete submissions (e.g. missing files
- Poor spelling and grammar

The mark distribution for this assignment is explained on the next page–please look at it carefully and compare your submission to the marking guide.

Marking Criteria/Rubric

Task	Available Marks	Student Mark
Stage 1: Design		
Development of an algorithm describing how the program should function		
• All requirements from the assignment sheet are included	2	
• Logical structure	2	
Development of five test cases		
• Five test cases are included (2.5 marks) and demonstrated (2.5 marks)	5	
Stage 2: Activity Flowchart		
Creation of an **activity flowchart** which clearly indicates how the program should operate, using the **correct symbols** for elements such as start/end points, processes and decision/branches	5	
Stage 3: Computer Program		
• Welcome message (including name of program/developer/student ID)	1	
• Text menu (must continue until the user exits)	2	

• Statistics
  ○ Total number of children in the text file
  ○ Average number of teeth claims over the years
  ○ Number of children who have never lost a tooth
  ○ Number of children who have lost all their baby teeth
  ○ Total expenditure for this year
	5	

• Print to a **new file**, a list of children who haven't lost any teeth	2	
• Display a graph showing the number of claims per State	3	
• Display a graph **comparing** the overall average number of teeth lost for two given States	3	
Use of Functions	10	
Sub Total		/40
Final		/20

Feedback

Assignments will be marked within 2 weeks of submission. Marks will be loaded in fdlGrades, and a completed marking sheet will be available via Moodle.

Plagiarism:

Plagiarism is the presentation of the expressed thought or work of another person as though it is one's own without properly acknowledging that person. You must not allow other students to copy your work and must take care to safeguard against this happening. More information about the plagiarism policy and procedure for the university can be found at http://federation.edu.au/students/learning-and-study/online-help-with/plagiarism.

Appendix 1

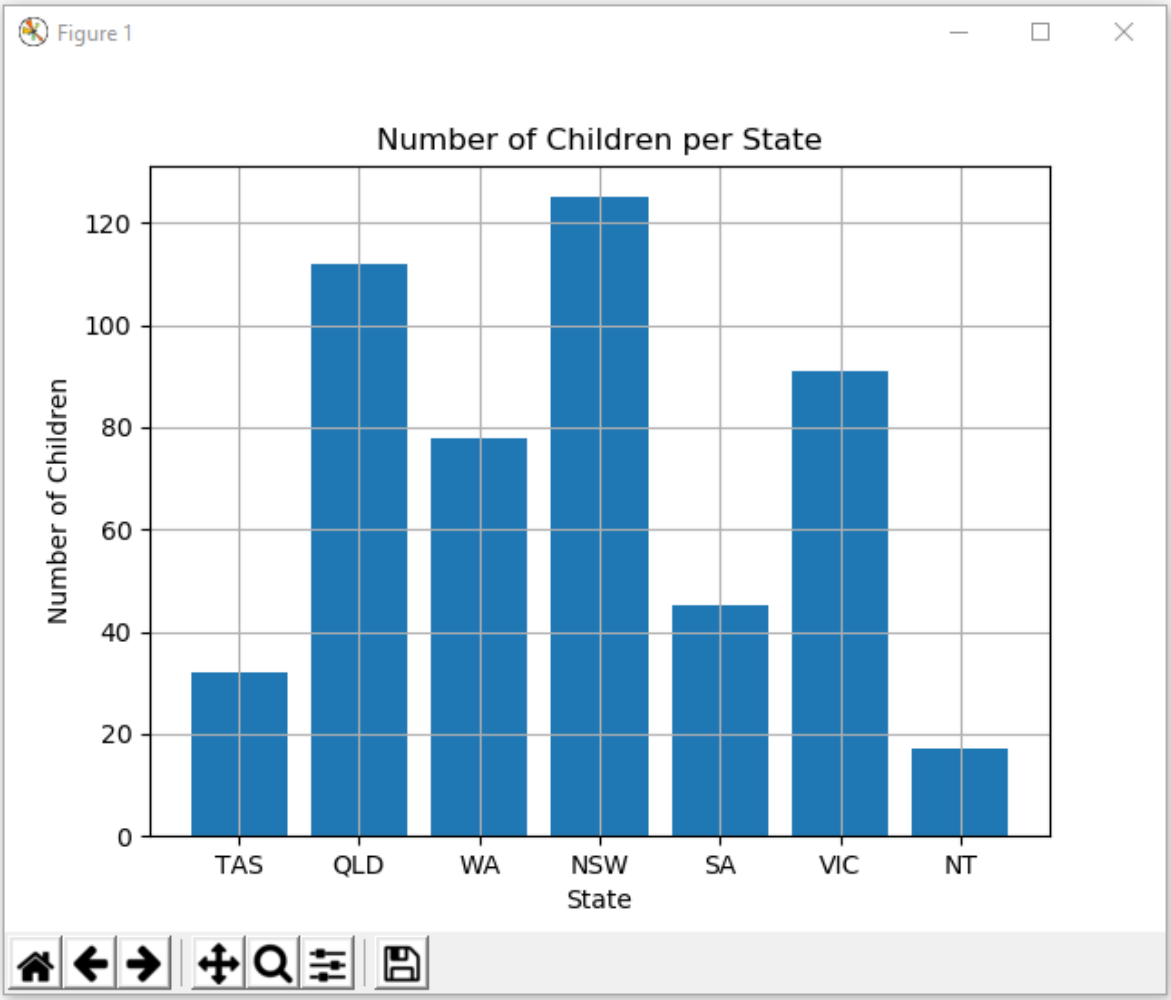
```
------------------------- TOOTH FAIRY - ATO CASE -------------------------
----------------------- Sarah Sprinter - 30045124 -----------------------
1. Statistics
2. Export childrens details who haven't lost any teeth
3. Display number of claims per State
4. Compare 2 States
5. Exit
--------------------------------------------------------------------------
Enter your choice [1-5] 1

Total number of children on list: 500
Average number of teeth claims over the years: 9.784
Number of children who have never lost a tooth: 17
Number of children who have lost all their baby teeth: 21
Total expenditure for this year: $244.50
```

```
------------------------- TOOTH FAIRY - ATO CASE -------------------------
----------------------- Sarah Sprinter - 30045124 -----------------------
1. Statistics
2. Export childrens details who haven't lost any teeth
3. Display number of claims per State
4. Compare 2 States
5. Exit
--------------------------------------------------------------------------
Enter your choice [1-5] 2
Enter new file name: NewKids.txt
17 children have been saved in NewKids.txt
```

```
------------------------- TOOTH FAIRY - ATO CASE -------------------------
----------------------- Sarah Sprinter - 30045124 -----------------------
1. Statistics
2. Export childrens details who haven't lost any teeth
3. Display number of claims per State
4. Compare 2 States
5. Exit
--------------------------------------------------------------------------
Enter your choice [1-5] 3
```

Ln: 3753 Col: 0



```
------------------------- TOOTH FAIRY - ATO CASE -------------------------
------------------------ Sarah Sprinter - 30045124 ------------------------
1. Statistics
2. Export childrens details who haven't lost any teeth
3. Display number of claims per State
4. Compare 2 States
5. Exit
--------------------------------------------------------------------------
Enter your choice [1-5] 4
Enter first state (TAS/QLD/WA/NSW/SA/VIC/NT): TAS
Enter second state (TAS/QLD/WA/NSW/SA/VIC/NT): NSW
```

Ln: 3764 Col: 0