ELEC362 Assessment 1

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Abstract

This Report outlines the 2 tasks given in ELEC362 Assignment 1 and discusses the solution to the problem and how the code has been constructed. We then move on to show the testing of the program and how it successfully achieves the specification.

Declaration

I confirm that I have read and understood the University's definitions of plagiarism and collusion from the Code of Practice on Assessment. I confirm that I have neither committed plagiarism in the completion of this work nor have I colluded with any other party in the preparation and production of this work. The work presented here is my own and in my own words except where I have clearly indicated and acknowledged that I have quoted or used figures from published or unpublished sources (including the web). I understand the consequences of engaging in plagiarism and collusion as described in the Code of Practice on Assessment (Appendix L).

Contents

Part 1: A Non-linear Circuit Problem

Introduction

The first task is to write a program which will calculate the voltage drop across the Resistor R_L in the circuit diagram shown in Figure 1. For this process we will be making the assumption that V_0 = 0.26v and R_L = 150 kΩ. we are also going to take the assumption that the special semiconductor diode has a current voltage characteristic given by:

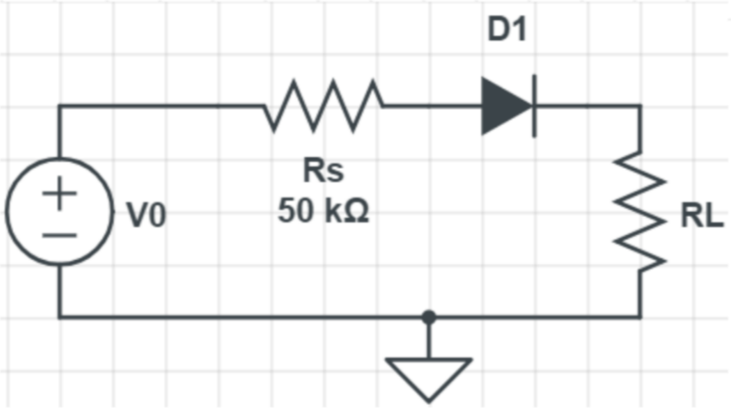


Figure 1: Circuit Diagram for Task 1

$$i = I_0\left(\frac{eV_D}{kT} - 1\right)$$

Where *i* is the diode current and V_D the voltage across the diode. e/kT= 40 at room temperature and I = 8x10^{-8} .

Program Design

The Program is designed with an object orientated approach. There are 4 object types:

- Diode
- Resistor
- Voltage Source
- Circuit

The Program is designed such that each object is created, with its key attributes, each of these objects is given to the Circuit object during its creation. We can then call the voltage over the diode from within the circuit. From this we can then calculate the voltage drop over RL.

Below is the class diagram for each key component

Diode	Resistor	VoltageSource	Circuit
private: double EKT public:	private: double Resistance public:	private: double Current double Voltage	private: double RS double RL double V double I double EKT double Precision = 0.0001
private: public: Diode(double newEKT) double getEKT()	private: public: Resistor(double R) double getResistance()	private: public: VoltageSource(double V, double I) double getCurrent() double getVoltage()	private: double FunctionOfX() double FunctionOfXD() public: Circuit(VoltageSource Voltage, Resistor Rload, Resistor RSource, Diode Diode) double CalculateVD(double Xi = 0.1) double CalculateVRL() void Summary()

This structure to design the program allows a large amount of redundancy and scalability. This means that with minimal additional modification the program could be used to calculate multiple different styles of circuit.

Results and Testing

As Shown in the screenshots I have tested this with the results in Table 1 which details the output inputs and if the result was as expected

Table 1: Test vales for task 1

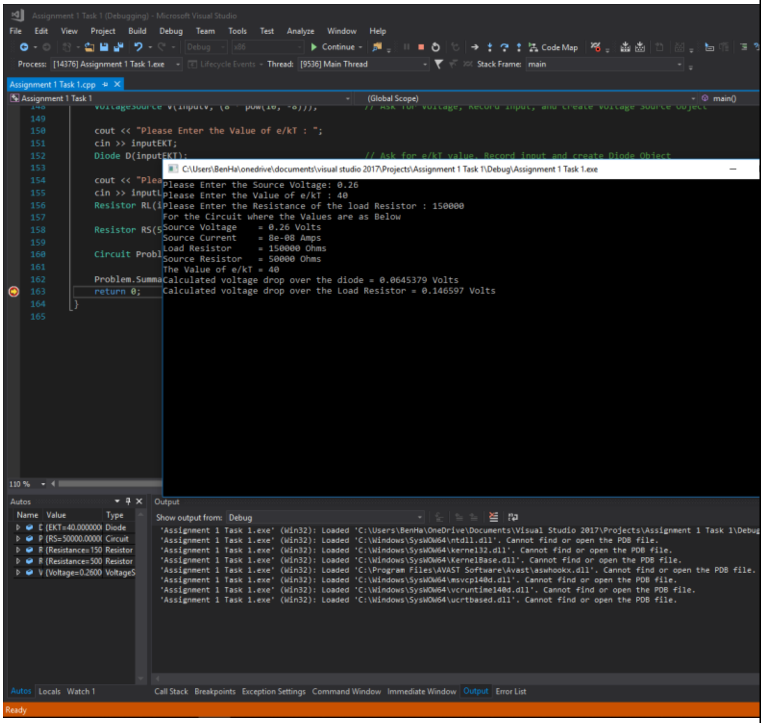
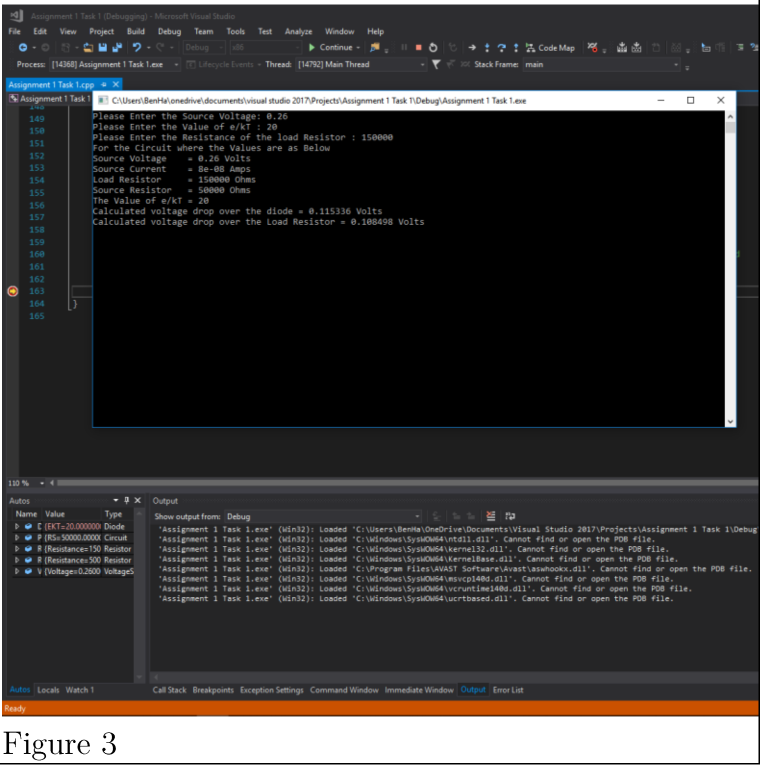
e/kT	R_L	V0	Voltage Over D	Voltage over RL	Comment	Screenshot
40	150000	0.26	0.0645379	0.146597	All as expected	 Figure 2
20	150000	0.26	0.115336	0.108498	All as expected	 Figure 3

Figure 2:

```
    VoltageSource V(inputV, (8 * pow(10, -8)));          // Ask for voltage, Record input, and create Voltage Source Object

    cout << "Please Enter the Value of e/kT : ";
    cin >> inputEKT;
    Diode D(inputEKT);                                   // Ask for e/kT value, Record input and create Diode Object

    cout << "Plea
    cin >> inputL
    Resistor RL(i

    Resistor RS(5

    Circuit Probl

    Problem.Summa
    return 0;
}
```

C:\Users\BenHa\onedrive\documents\visual studio 2017\Projects\Assignment 1 Task 1\Debug\Assignment 1 Task 1.exe

```
Please Enter the Source Voltage: 0.26
Please Enter the Value of e/kT : 40
Please Enter the Resistance of the load Resistor : 150000
For the Circuit where the Values are as Below
Source Voltage    = 0.26 Volts
Source Current    = 8e-08 Amps
Load Resistor     = 150000 Ohms
Source Resistor   = 50000 Ohms
The Value of e/kT = 40
Calculated voltage drop over the diode = 0.0645379 Volts
Calculated voltage drop over the Load Resistor = 0.146597 Volts
```

Name	Value	Type
D	{EKT=40.000000	Diode
P	{RS=50000.0000	Circuit
R	{Resistance=150	Resistor
R	{Resistance=500	Resistor
V	{Voltage=0.2600	VoltageS

Show output from: Debug

```
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Users\BenHa\OneDrive\Documents\Visual Studio 2017\Projects\Assignment 1 Task 1\Debug
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ntdll.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\kernel32.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\KernelBase.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Program Files\AVAST Software\Avast\aswhookx.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\msvcp140d.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\vcruntime140d.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ucrtbased.dll'. Cannot find or open the PDB file.
```

Figure 3:

C:\Users\BenHa\onedrive\documents\visual studio 2017\Projects\Assignment 1 Task 1\Debug\Assignment 1 Task 1.exe

```
Please Enter the Source Voltage: 0.26
Please Enter the Value of e/kT : 20
Please Enter the Resistance of the load Resistor : 150000
For the Circuit where the Values are as Below
Source Voltage    = 0.26 Volts
Source Current    = 8e-08 Amps
Load Resistor     = 150000 Ohms
Source Resistor   = 50000 Ohms
The Value of e/kT = 20
Calculated voltage drop over the diode = 0.115336 Volts
Calculated voltage drop over the Load Resistor = 0.108498 Volts
```

Name	Value	Type
D	{EKT=20.000000	Diode
P	{RS=50000.0000	Circuit
R	{Resistance=150	Resistor
R	{Resistance=500	Resistor
V	{Voltage=0.2600	VoltageS

Show output from: Debug

```
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Users\BenHa\OneDrive\Documents\Visual Studio 2017\Projects\Assignment 1 Task 1\Debug
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ntdll.dll'. Cannot find or open the PDB file.
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'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ucrtbased.dll'. Cannot find or open the PDB file.
```

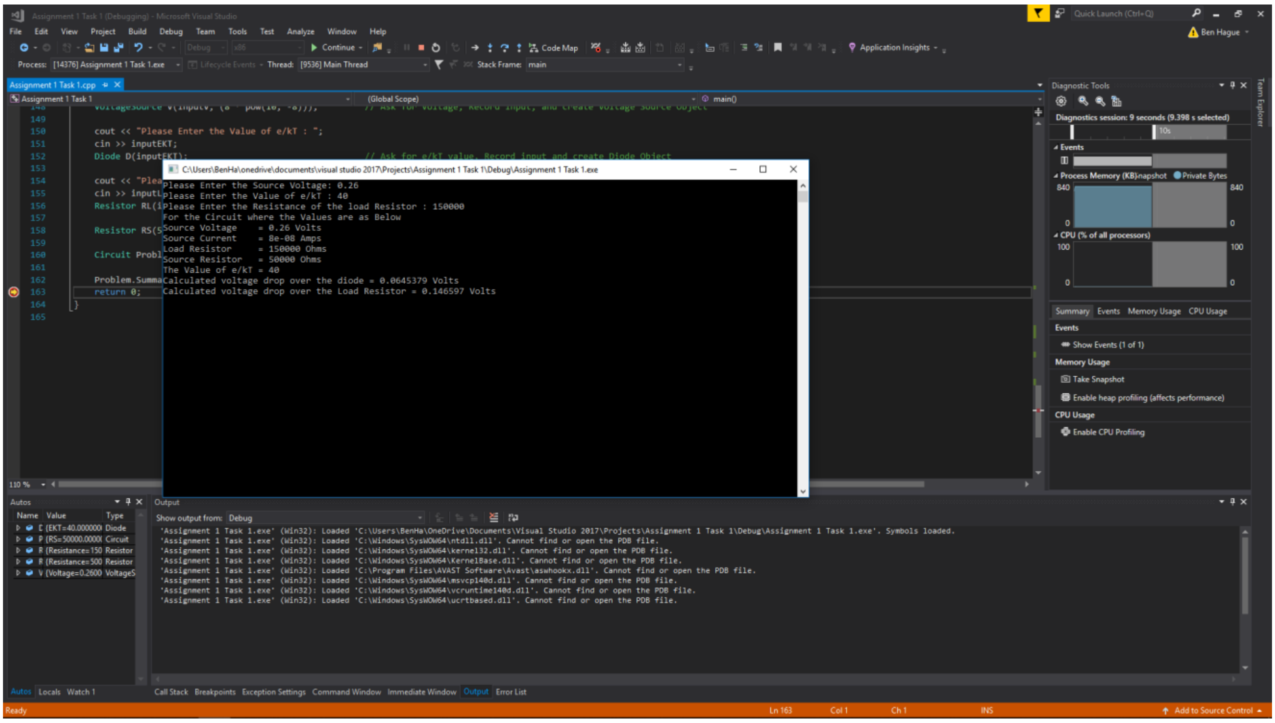

C:\Users\BenHa\onedrive\documents\visual studio 2017\Projects\Assignment 1 Task 1\Debug\Assignment 1 Task 1.exe

```
Please Enter the Source Voltage: 0.26
Please Enter the Value of e/kT : 40
Please Enter the Resistance of the load Resistor : 150000
For the Circuit where the Values are as Below
Source Voltage    = 0.26 Volts
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Load Resistor     = 150000 Ohms
Source Resistor   = 50000 Ohms
The Value of e/kT = 40
Calculated voltage drop over the diode = 0.0645379 Volts
Calculated voltage drop over the Load Resistor = 0.146597 Volts
```

Output

Show output from: Debug

```
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Users\BenHa\OneDrive\Documents\Visual Studio 2017\Projects\Assignment 1 Task 1\Debug\Assignment 1 Task 1.exe'. Symbols loaded.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ntdll.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\kernel32.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\KernelBase.dll'. Cannot find or open the PDB file.
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'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ucrtbased.dll'. Cannot find or open the PDB file.
```
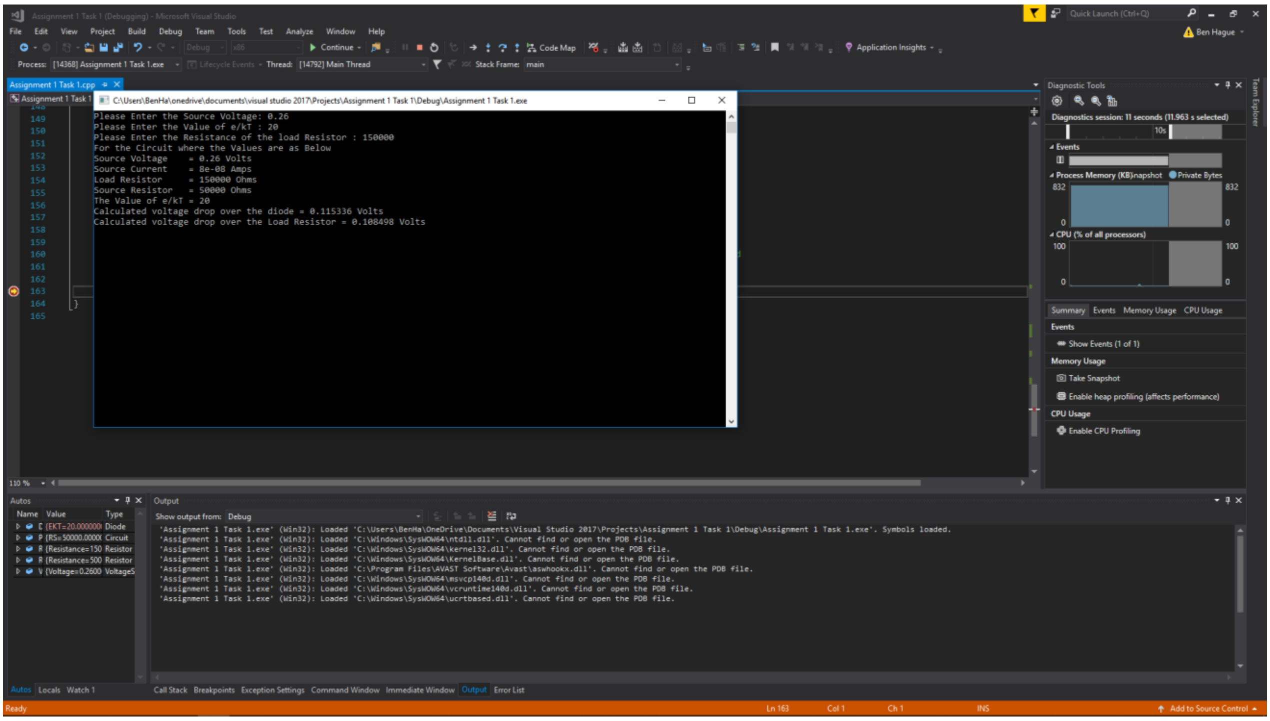

Assignment 1 Task 1 (Debugging) - Microsoft Visual Studio
File Edit View Project Build Debug Team Tools Test Analyze Window Help
Continue
Process: [14376] Assignment 1 Task 1.exe
Thread: [9536] Main Thread
Stack Frame: main
Assignment 1 Task 1.cpp
(Global Scope)
main()
Diagnostic Tools
Diagnostics session: 9 seconds (9.398 s selected)
Events
Process Memory (KB)
Private Bytes
CPU (% of all processors)
Summary Events Memory Usage CPU Usage
Show Events (1 of 1)
Take Snapshot
Enable heap profiling (affects performance)
Enable CPU Profiling
Autos
Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Error List
Ready
Ln 163 Col 1 Ch 1 INS
Add to Source Control

Figure 2: Screenshot from part 1 testing



C:\Users\BenHa\onedrive\documents\visual studio 2017\Projects\Assignment 1 Task 1\Debug\Assignment 1 Task 1.exe

```
Please Enter the Source Voltage: 0.26
Please Enter the Value of e/kT : 20
Please Enter the Resistance of the load Resistor : 150000
For the Circuit where the Values are as Below
Source Voltage    = 0.26 Volts
Source Current    = 8e-08 Amps
Load Resistor     = 150000 Ohms
Source Resistor   = 50000 Ohms
The Value of e/kT = 20
Calculated voltage drop over the diode = 0.115336 Volts
Calculated voltage drop over the Load Resistor = 0.108498 Volts
```

Output

Show output from: Debug

```
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Users\BenHa\OneDrive\Documents\Visual Studio 2017\Projects\Assignment 1 Task 1\Debug\Assignment 1 Task 1.exe'. Symbols loaded.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ntdll.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\kernel32.dll'. Cannot find or open the PDB file.
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'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\vcruntime140d.dll'. Cannot find or open the PDB file.
'Assignment 1 Task 1.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ucrtbased.dll'. Cannot find or open the PDB file.
```

Assignment 1 Task 1 (Debugging) - Microsoft Visual Studio
File Edit View Project Build Debug Team Tools Test Analyze Window Help
Continue
Process: [14368] Assignment 1 Task 1.exe
Thread: [14792] Main Thread
Stack Frame: main
Assignment 1 Task 1.cpp
Diagnostic Tools
Diagnostics session: 11 seconds (11.963 s selected)
Events
Process Memory (KB)
Private Bytes
CPU (% of all processors)
Summary Events Memory Usage CPU Usage
Show Events (1 of 1)
Take Snapshot
Enable heap profiling (affects performance)
Enable CPU Profiling
Autos
Call Stack Breakpoints Exception Settings Command Window Immediate Window Output Error List
Ready
Ln 163 Col 1 Ch 1 INS
Add to Source Control

Figure 3 Screenshot from part 1 testing

Obstacles

The main obstacle with this code was to effectively code the newton Raphson method, I ended up deciding to use recursion as this allowed me to have effective code which would not endlessly loop. I also had an issue with the maths as this is not one of my strong points.

Part 2: Programming Exercise

Introduction

The second task of this assignment is to write a program which reads 5 full names from the keyboard, capitalises the first letter of each name and stores the names on a new line in a known file.

Program Design

We can split the task into 3 different sections

Data Collection – the process of collecting the name and storing it in a variable

Data Processing – how we capitalise different names and putting them in a storable format

Data Storage – how we store the names in the file

For the data collection we would take the input and ensure it only uses valid characters and return the output.

For data processing we separate the first, last and middle names with commas. This means that they can be outputted to a comma separated value file and opened with a spreadsheet program.

The data storage stores the data in a specified file for later use.

This process is then repeated for the 5 different names.

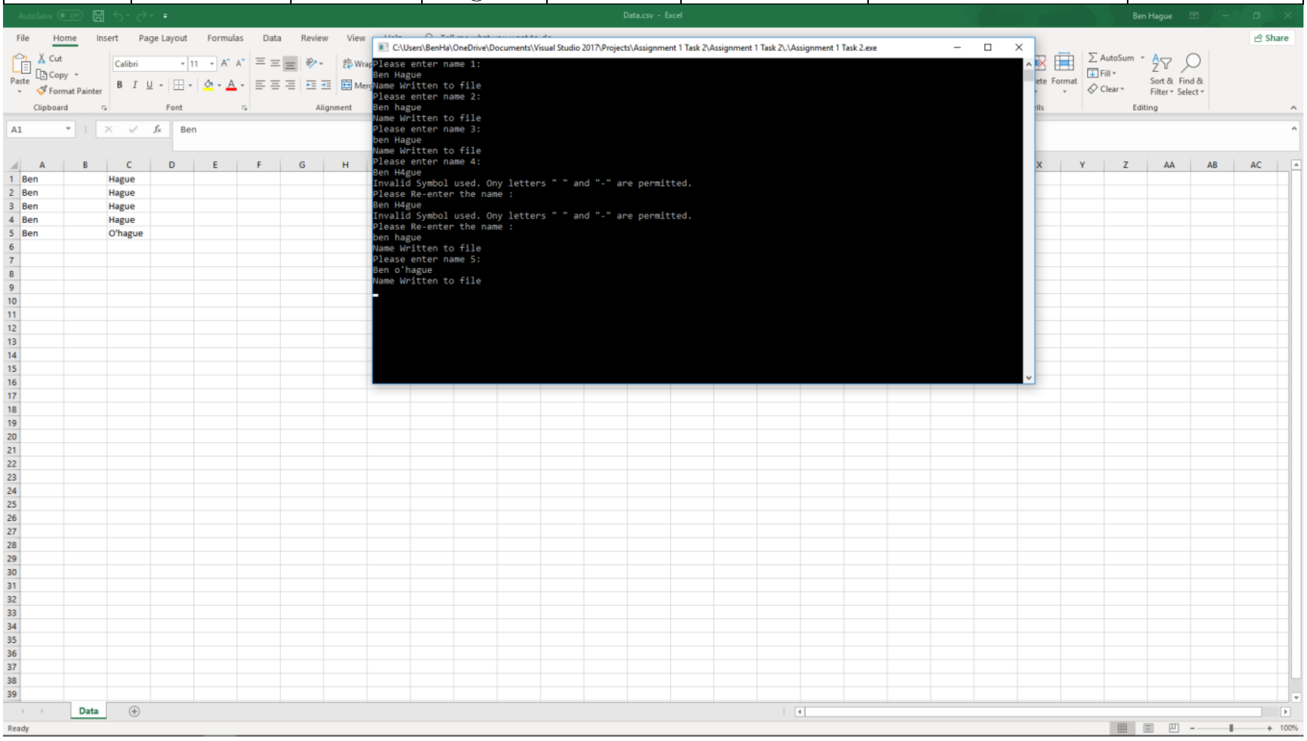
Results and Testing

The testing strategy is to input variety of inputs and record the output to show how they work.

Table 2: Test Values for task 2

Name 1	Name 2	Name 3	Name 4	Name 5	Results	Comment	Screenshot
Ben Hague	Ben hague	ben Hague	Ben H4gue	Ben o'hague	As expected	Wouldn't accept name 4 as input due to the number 4	Figure 4
Ben hague-hague	Benjamin George Hague	Ben Georg3	ben George	Ben Ha£ue	As expected	Rejected input on names 3 and 5	Figure 5

		Hague-kin	harry hague				



Data.csv - Excel

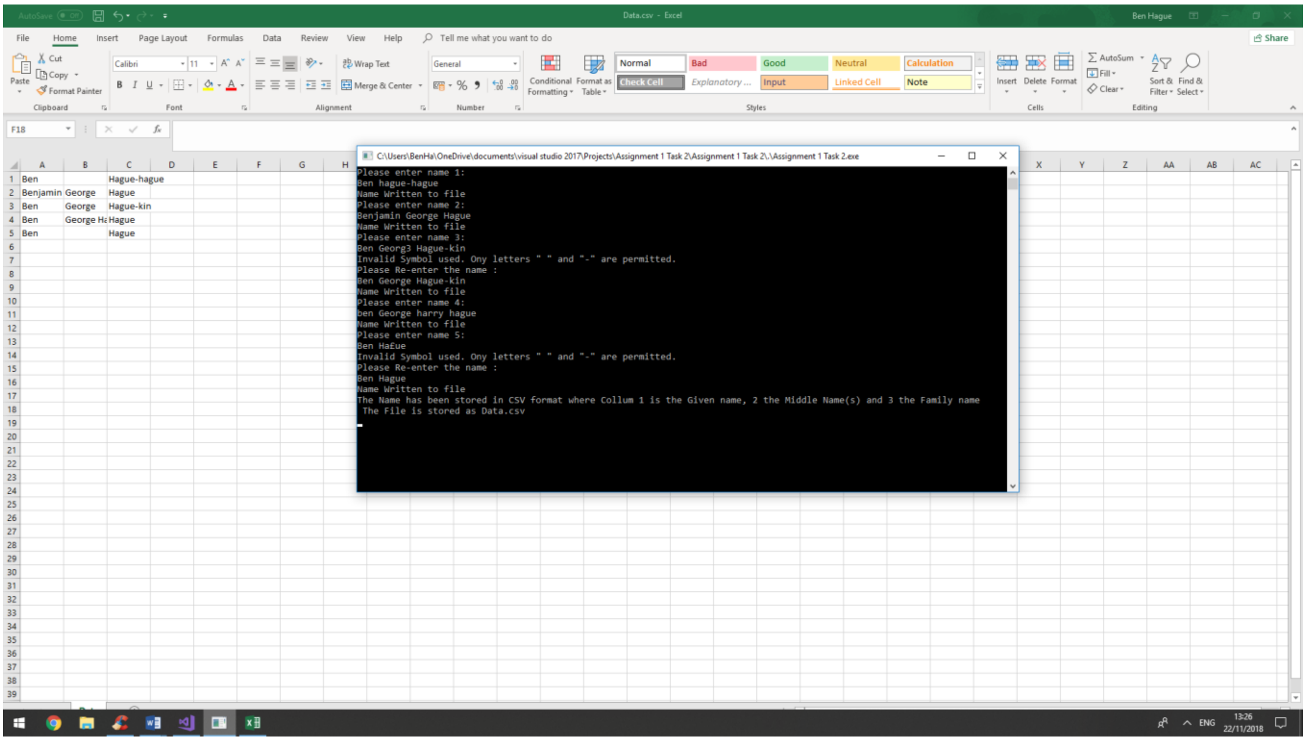
C:\Users\BenHa\OneDrive\Documents\Visual Studio 2017\Projects\Assignment 1 Task 2\Assignment 1 Task 2\.\Assignment 1 Task 2.exe

```
Please enter name 1:
Ben Hague
Name Written to file
Please enter name 2:
Ben hague
Name Written to file
Please enter name 3:
ben Hague
Name Written to file
Please enter name 4:
Ben H4gue
Invalid Symbol used. Ony letters " " and "-" are permitted.
Please Re-enter the name :
Ben H4gue
Invalid Symbol used. Ony letters " " and "-" are permitted.
Please Re-enter the name :
ben hague
Name Written to file
Please enter name 5:
Ben o'hague
Name Written to file
```

A1 Ben

	A	B	C
1	Ben		Hague
2	Ben		Hague
3	Ben		Hague
4	Ben		Hague
5	Ben		O'hague

Figure 4: Screenshot from part 2 testing



Data.csv - Excel

C:\Users\BenHa\OneDrive\documents\visual studio 2017\Projects\Assignment 1 Task 2\Assignment 1 Task 2\.\Assignment 1 Task 2.exe

```
Please enter name 1:
Ben hague-hague
Name Written to file
Please enter name 2:
Benjamin George Hague
Name Written to file
Please enter name 3:
Ben Georg3 Hague-kin
Invalid Symbol used. Ony letters " " and "-" are permitted.
Please Re-enter the name :
Ben George Hague-kin
Name Written to file
Please enter name 4:
ben George harry hague
Name Written to file
Please enter name 5:
Ben Hafue
Invalid Symbol used. Ony letters " " and "-" are permitted.
Please Re-enter the name :
Ben Hague
Name Written to file
The Name has been stored in CSV format where Collum 1 is the Given name, 2 the Middle Name(s) and 3 the Family name
 The File is stored as Data.csv
```

F18

	A	B	C
1	Ben		Hague-hague
2	Benjamin	George	Hague
3	Ben	George	Hague-kin
4	Ben	George Ha	Hague
5	Ben		Hague

Figure 5: Screenshot from part 2 testing

Obstacles

The “£” sign proved problematic and did not work with the to upper command in C, to avoid this issue I wrote a short Capitalise code which converted it. I also had to include separate code to negotiate spaces being present at the start or end as it caused an input issue.

Appendix

Appendix 1: Code for Part 1

```
// Assignment 1 Task 1.cpp
// Assignmnet 1 is a piece of code which calculates the Voltage drop over a diode in a simple
circuit
// The assignment uses an Object Orientated approach for data management and calculations

#include "stdafx.h"
#include <cmath>
#include "iostream"
using namespace std;
/*
The first section creates object types for the key 3 types of components in the circuit:
Diode holds the value for e/kT, this is a constant we use which is dependant on the diode.
Resistor holds a resistance value.
Voltage Source holds the current and voltage in the circuit.
*/

class Diode
{
private:
       double EKT;                                // Declare the double EKT in a private
instance

public:
       Diode(double newEKT)        // Constructor, the diode object is created with the value
for e/kT
       {
              EKT = newEKT;
       }
       double getEKT()                            // public Method returns the value of private
Variable EKT for use in calculation.
       {
              return EKT;
       }
};

class Resistor
{
private:
       double Resistance;                         // Declare the double Resistance in a private
instance.
public:
       Resistor(double R)
       {
              Resistance = R;                     // Constructor, the resistor object is
created with the value for Resistance
       }
       double getResistance()
       {
              return Resistance;          // public Method returns the value of private
Variable Resistance for use in calculation
       }
};

class VoltageSource
{
private:
       double Voltage, Current;    // Declare the variables Voltage and current as doubles in
a private instance

public:
       VoltageSource(double V , double I) // Constructor, the VoltageSource object is created
with a value for Voltage and current
       {
              Voltage = V;
              Current = I;
       }
       double getVoltage()                // public Method returns the value of private
Variable Voltage for use in calcuation
       {
              return Voltage;
       }
       double getCurrent()                // public Method returns the value of private
Variable Current for use in calcuation
       {
              return Current;
       }

};

/*
The Second Section Contains the Circuit object
The Circuit object is given the relevent components and then we can use this to discover the
voltage drop over the diode
*/

class Circuit                             // Define a class Circuit for finding the
Calculations
{

private:
       double RS, RL, V, EKT,I;    // Define doubles For Source Resistance,Load Resistance,
Voltage, E/KT and Current

       double Precision = 0.0001;  // Declare the precicsion as 5 significant figures

       double FunctionOfX(double x)              // Calculates the Function of X (Inluded for
completeness and modularity)
       {
              double Fx;
              Fx = (I*(exp(EKT*x) - 1) - ((V - x) / (RS + RL)));
              return Fx;
       }

       double FunctionOfXD(double x)            // Calculates the derivative for the Function
of X (Inluded for completeness and modularity)
       {
              double FDx;
              FDx = I*(EKT*exp(EKT*x)) + (1 / (RS + RL));
              return FDx;
       }
public:
       Circuit(VoltageSource Voltage, Resistor Rload, Resistor RSource, Diode Diode)      //
Constructors takes input of a set of components (Voltage Source, 2 Resistors and a diode)
       {
              V = Voltage.getVoltage();                // Take the needed variables from each
of the input components and store it in a relevant Local Variable
              I = Voltage.getCurrent();
              RS = RSource.getResistance();
              RL = Rload.getResistance();
              EKT = Diode.getEKT();
       }

       double CalculateVD(double Xi = 0.1)             // Uses the Newton Raphson Method to
calculate the voltage drop over the diode takes an input of a guessed preliminary x value
       {
              double Xii = (Xi - (FunctionOfX(Xi) / FunctionOfXD(Xi)));     // Calculate the
next value of X "Xii"
              if (abs((Xii - Xi) / Xi) >= Precision)                                      //
Determine whether the new value of x is right for the current number of significant figures.
              {
                     return CalculateVD(Xii);
       // If not right, return the value given by running The newton Raphson method on the
current value of Xii
              }
              else {
                     return Xi;
                     // If right return the value for Xi
              }
       }
       double CalculateVRL()                           // Calculates the value of the voltage
drop over RL
       {
              double VD = CalculateVD();  // Gets the Voltage Drop over the diode
              return (V - VD)*(RL / (RS + RL)); // Returns the voltage drop over the resistor
       }

       void Summary()
                     // Summary prints a summary of the calculations to the console window.
       {
              cout << "For the Circuit where the Values are as Below"  << endl;
              cout << "Source Voltage    = " << V << " Volts"<< endl;
              cout << "Source Current    = " << I << " Amps" << endl;
              cout << "Load Resistor     = " << RL << " Ohms" << endl;
              cout << "Source Resistor   = " << RS << " Ohms" << endl;
              cout << "The Value of e/kT = " << EKT << endl;
              cout << "Calculated voltage drop over the diode = "<< CalculateVD() << " Volts"
<< endl;
              cout << "Calculated voltage drop over the Load Resistor = " << CalculateVRL()
<< " Volts" << endl;

       }
};

/*
The third part is the main class
This part handles user interaction, gets inputs, declares objects and does all the other bits
and bobs
*/

int main()
{
       double inputV, inputEKT, inputLR;                             // Declare variables for
the inputs

       cout << "Please Enter the Source Voltage: ";
       cin >> inputV;

       VoltageSource V(inputV, (8 * pow(10, -8)));                   // Ask for Voltage,
Record input, and create Voltage Source Object
```

```
       cout << "Please Enter the Value of e/kT : ";
       cin >> inputEKT;
       Diode D(inputEKT);                                                          // Ask for
e/kT value, Record input and create Diode Object

       cout << "Please Enter the Resistance of the load Resistor : ";
       cin >> inputLR ;
       Resistor RL(inputLR);                                                       // Ask for
Load Resistance, Record input and create Diode Object

       Resistor RS(50000);                                                         // Create
Resistor Object with a resistance of 50000ohms

       Circuit Problem( V, RL, RS, D);                                      // Create Object
for the circuit Giving the circuit the components needed

       Problem.Summary();                                                          // Print
Summary of the Problem
    return 0;
}
```

Appendix 2: Code for Part 2

```
// Assignment 1 Task 2.cpp : Defines the entry point for the console application.
//

#include "stdafx.h"
#include "iostream"
#include <string>
#include <fstream>

using namespace std;


char Capitalise(char InputChar)                                // Capitalise is a short
segment of code using the Ascii value of a letter to determine if it is lowercase and if so,
capitalise it
{                                                                                          //
Takes a char input and gives a char output
       int InputInt = (int)InputChar;                                // Find the Ascii Value
for input char
       if ('a' <= InputInt && InputInt <= 'z')         // if the input char is lower case 97
is "a" and 122 is "z"
       {
              InputInt -= 32;                                                      // Convert
the Input char to a capital by subtracting 32 from the char value (Ascii table magic)
       }
       return (char)InputInt;                                               // return the new
char
}

string PrepName(string Input)                                  // SentanceCase is a function
which looks for spaces within a statement and capitalises the first letter after the space
useing Capitalise
{                                                                                          //
Takes a string input and gives a string output
       Input[0] = Capitalise(Input[0]);                        // This line is important as it
ensures the first letter of the string is capitalised
       int Fspace = 1000;                                                   // this is used
to find the first space, we choose an unrealisticly high number to allow the first space to
be identified
       int Lspace = 0;                                                              // this is
used to find the last space, we make the first number 0 as this is the beginingg of the array
       for (int i = 0; i < (int)Input.length()-1; i++)  // For i in the range of 0  to the
length of the string
       {
              if ((char)Input[i] == ' ')                                     // if the char is
a space
              {
                     if (i < Fspace) { Fspace = i; }                                // store
the location for the first space in Fspace
                     if (i > Lspace) { Lspace = i; }                                // store
the location for the last space in Lspace
                     Input[i + 1] = Capitalise(Input[i + 1]);        // use the Capitalise
function to ensure the next charachter is a capital
              }
       }
       Input[Fspace] = ',';                                          // Convert the first
space to a comma for the csv file
       if (Fspace == Lspace) {                                              // if there are
only two names determined by the difference between first and last space
              Input.insert(Lspace, ",");                                    // insert an
additional comma to indicate a blank colum for middle name
```

```
       }
       else {                                                                           // if
there are not 2 names
              Input[Lspace] = ',';                                         // replace the final
space to a comma at the end of the middle names
       }
       return Input;                                                              // Return the new
modified comma deliminated string
}
string GetText()                                                                  // Get the user
input and verify it
{
       string Input = " ";                                                        // Declare the
input string
       try
       {
              getline(cin, Input);                                         // Get the input from
the screen

              for (int i = 0; i < ((int)Input.length() - 1); i++)          // For i in the
range of 0  to the length of the string
              {
                     if (false ==(((char)Input[i]>='a'&& (char)Input[i]<='z') ||
((char)Input[i] >= 'A' && ( char)Input[i] <= 'Z') || ((char)Input[i] == ' ') ||
((char)Input[i] == '-') || ((char)Input[i] == '\'')))                                      //
if the char is a space
                     {
                            throw std::invalid_argument("Non Valid Characters Detected"); //
if not valid input throw invalid_argument
                     }
              }
              return Input;

       }
       catch (std::invalid_argument)      //     catch invalid argument say prompt and return
the GetText Function
       {
              cout << "Invalid Symbol used. Ony letters \" \" and \"-\" are permitted. " <<
endl;
              cout << "Please Re-enter the name : " << endl;
              return GetText();
       }


}

int main()
{
       string address = "Data.csv";       // declare a source file
       ofstream File;                                  // start and output stream called file
       string Name;                             // Declare the name Variable
       int noOfPeople = 5;                      // declare an integer for number of people
       for (int Person = 1; Person <=noOfPeople; Person++)          // for number of people
       {
              cout << "Please enter name " <<  Person << ": " << endl;
              Name = GetText();
              File.open(address, ios::app);      //get name input

              Name = PrepName(Name);                    // Procees the name to the correct
format

              File << Name << endl;                     // Write the name to the file
```

```
                cout << "Name Written to file" << endl;
                File.close();                              // close the file
        }
        cout << "The Name has been stored in CSV format where Collum 1 is the Given name, 2
the Middle Name(s) and 3 the Family name \n The File is stored as "<< address << endl;
        //print a summary
        return 0;
}
```