

# BAYLEY COWEN-SEAGROVE A453

Bayley Cowen-Seagrove

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## A453

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### INTRODUCTION

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In my controlled assessment I intend to complete all three tasks and find an efficient solution to each of the tasks. I will treat each task as a separate assessment; however each task will include the previous task's code to a working solution. My aim is to complete task one to the best of my ability and expand the code to fit the requirements of task two, continue to code to produce a working solution for task three, test and write up the final, most efficient code.

### SOFTWARE THAT WAS USED

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The software used to create the solution to task one to three using the standard version of Visual Basic now known as Visual Studio (2013 edition). A large advantage of Visual Basic is the rapid application development. You are able to create a fully functional computer system within 60 to 90 days for windows operating system. Another advantage is that you don't need to learn the script language to be able to modify the code. Another advantage of using Visual Studio is that you do not need to learn scripting language in order to create, develop or edit your code. A positive result of this is that you do not have to script HTML directly onto the form's design and as a result, the code is kept separate and is easy to annotate and evaluate. However, there are disadvantages to the standard version of visual basic. The most noticeable of being that it is a Microsoft based application and transferring code from one application to another may be difficult through the different formatting styles-yet this is not an issue we face within school as all scripting programs are developed and managed by Microsoft. Moreover, Visual Studio requires a lot of memory for the initial loading of the form.

### SAFETY

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I intend to gain my knowledge by searching via Google to be able to fully understand what the task is asking me to do. I will only use sites that are like Microsoft help and trustworthy companies. I will not find my information from sites such as Stack Overflow, Wiki Answer etc. I will have to take breaks from looking at a computer screen and/or looking at a book/magazine/article as it can create nausea which can affect my state of mind. To keep my safety on a computer I will not download files from any un-trustworthy websites that state that they have files with the purpose of explaining in detail what I require as they could contain Malware, Viruses or programs that allow overtake of a computer.

## TASK ONE

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### INTRODUCTION TO TASK ONE

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In Task One, the specification asks to create an application that will be able to calculate the average speed of a vehicle after passing two sites which have a known distance apart. By recording the time the vehicle passed the first site and taking that from the time the vehicle passed the second site, the time difference between the sites can be found. This time difference and distance between sites will allow the application to calculate the average speed of the vehicle in miles per hour. The task also states for the application to output the registration plates that have exceeded the speed limit inputted by the user, or if the vehicle is not breaking the speed limit to alert the user that the vehicle is within the speed limit.

### SUCCESS CRITERIA

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- The system must be able to input the time taken for the automobile to reach the second site from passing the first site.
- The system has to be able to input the vehicle's registration number.
- Must put in location and name of road.
- Must be able to input the length of the road.
- Must be able to calculate the overall speed of the car.
- Must produce a list of vehicles that are breaking the speed limit.
- All buttons work.
- Includes validation

### EVIDENCE OF MY PLANNING

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Please enter the location of site	<input type="text"/>
Please enter the speed limit (mph)	<input type="text"/>
Please enter time the car passed Site 1	<input type="text"/>
Please enter time the car passed Site 2	<input type="text"/>
Please enter the distance of Site 1-Site 2(miles)	<input type="text"/>
Please enter registration number of vehicle	<input type="text"/>
Average Speed of the Car	<div>Vehicles breaking the limit</div>
Speed over Limit	
<div>Submit</div> <div>Reset</div>	

## TEST PLANS

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### TEST PLAN 1 – ENTERING DATA

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Test Reference	Reason for Test	Test Instructions	Expected Result
001	Testing if the user can enter the name of the road.	Type the name of the road in the first textbox.	The road name will appear in the textbox and will not be deleted are being entered.
002	Testing if the user can enter the speed limit of the road.	Type the speed limit of the road in the second textbox.	The speed limit will appear in the textbox and will not be deleted are being entered.
003	Testing if the user can enter the time the vehicle passed site one.	Type the time the vehicle passed the first site in the third textbox.	The time will appear in the textbox and will not be deleted are being entered.
004	Testing if the user can enter the time the vehicle passed site two.	Type the time the vehicle passed the second site in the fourth textbox.	The time will appear in the textbox and will not be deleted are being entered.
005	Testing if the user can enter the distance between the sites.	Type the distance between the first and second site in the fifth textbox.	The distance between the sites will appear in the textbox and will not be deleted are being entered.
006	Testing if the user can enter the registration number.	Type the registration plate of the vehicle that is being assessed into the sixth textbox.	The registration plate of the vehicle will appear in the textbox and will not be deleted are being entered.
007	Testing if the reset function works.	Click the button which is labelled “reset”	The form will completely reset and all data inputted and outputted by the form will be reset.

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**TEST PLAN 2- CALCULATING SPEED**


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<b>Test Reference</b>	<b>Reason for Test</b>	<b>Test Instructions</b>	<b>Expected Result</b>
008	Testing if the application can calculate the average speed of a vehicle and outputting the speed into a label.	Enter all necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two and submit the data.	The average speed of the vehicle will be outputted into a label which will tell the user the average speed of the vehicle in miles per hour.
009	Testing extremes- if the application can calculate the vehicle to be only 1mph over the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data.	As the vehicle is breaking the limit the form will subtract the speed limit from the average speed and output the speed over limit in the format "The vehicle is 1mph over the limit" onto a label.
010	Testing extremes- if the application can calculate the vehicles speed to be 1mph under the limit and recognise it is not breaking the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data.	As the vehicle is not breaking the speed limit the form will alert the user that the vehicles is not over the speed limit.



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**TEST PLAN 3- OUTPUTTING DATA**


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<b>Test Reference</b>	<b>Reason for Test</b>	<b>Test Instructions</b>	<b>Expected Result</b>
011	Testing to see if the form can recognise that the speed of the vehicle is 1mph under the limit and does not output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit, registration plate and submit the data.	As the average speed is not greater than the speed limit (average speed < speed limit) the form will alert the user with a message box that the vehicle is not breaking the limit and the registration plate will not be outputted to the listbox.
012	Testing to see if the form can recognise that the speed of the vehicle is 1mph over the limit and does output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, registration plate, speed limit and submit the data.	As the average speed is greater than the speed limit (average speed > speed limit) the registration plate entered by the user will be outputted into a listbox which is labelled "vehicles breaking the speed limit".

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**TEST PLAN 4-VALIDATION**


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<b>Test Reference</b>	<b>Reason for Test</b>	<b>Test Instructions</b>	<b>Expected Result</b>
V1	To test if the validation for the road name textbox works.	Enter all fields apart from the road name.	A message box will alert the user that the road name must be entered to continue.
V2	To test if the validation for the speed limit textbox works.	Enter all fields apart from the speed limit.	A message box will alert the user that the speed limit must be entered to continue.
V3	To test if the validation for the time passed site one masked textbox works.	Enter all fields apart from the time passed site one field.	A message box will alert the user that the time passed site one must be entered to continue.
V4	To test if the validation for the time passed site two masked textbox works.	Enter all fields apart from the time passed site two field.	A message box will alert the user that the time passed site two must be entered to continue.
V5	To test if the validation for the distance between sites textbox works.	Enter all fields apart from the distance between sites.	A message box will alert the user that the distance between sites must be entered to continue.
V6	To test if the validation for the registration plate textbox works.	Enter all fields apart from the registration plate.	A message box will alert the user that the registration plate must be entered to continue.
V7	To test if the user cannot enter numeric digits for the road name.	For the road name field enter "1".	A message box will appear alerting the user the road name is invalid.
V8	To test if the user cannot enter characters for the speed limit.	For the speed limit field enter "one".	A message box will appear alerting the user the speed limit is invalid.
V9	To test if the user cannot enter characters for the distance between sites.	For the distance between sites field enter "one".	A message box will appear alerting the user the distance between sites is invalid.

## IMPLEMENTATION FOR TASK ONE

Code	What it does
<pre> Dim Date1, Date2 As Date Dim timediff, averageSpeed, roadLength As Double Dim speedLimit As Double Dim regnum, roadName As String </pre>	<p>These are the variables which are going to be used throughout the code to create efficiency within the code. Date1 and Date2 are both set as Date variables due to the fact that the function, DateDiff will only works if it the variables being entered by the user are of the formatting of a time/date. Moreover, the speedLimit, roadLength and time difference is set as a double variable because it will be able to accommodate for a large and small magnitudes for the number. I have chosen to use string for the registration plate and it consists of numerical value as characters e.g. "AA00AAA" and string can accommodate for this. As it can accommodate for a string of characters I chose to use the data type string for the name of the road. Finally I chose to use double for the averageSpeed instead of Integer as the</p>
<pre> Sub Dimming()     roadName = Me.TextBox1.Text     speedLimit = Me.TextBox4.Text     regnum = Me.TextBox2.Text     Date1 = Me.MaskedTextBox1.Text     Date2 = Me.MaskedTextBox2.Text     roadLength = Me.TextBox3.Text End Sub </pre>	<p>The variable Date1 is what the user will enter as the first time reading used in the calculation which is the time the vehicle passed the first site. Whatever is entered into MaskedTextBox1 and MaskedTextBox2 will be stored in the program as the Date1 and Date2 as in the public sub routine, I have stated that the user's input for MaskedTextBox1 and MaskedTextBox2 will equal the variables Date1 and Date2. This is the same for speedLimit, regnum, roadLength and roadName so if I but Dimming( ) into a private sub routine it will be able to use this for all the variables.</p>
<pre> Controls.Clear() InitializeComponent() </pre>	<p>This code allows the user to reset all the values that they have inputted into the form and allows them to reset all outputs given out by the form. The Controls.Clear is set to clear all fields which include Textboxes, MaskedTextboxes and Listboxes as well as labels. The second line Initializes the reset so all inputted and outputted data is lost.</p>
<pre> If Me.TextBox3.Text.Length = 0 Then MsgBox("Please enter the name of the road", vbInformation, "Validation Alert") Exit Sub ElseIf Me.TextBox1.Text.Length = 0 Then MsgBox("Please enter the speed limit", </pre>	<p>Through the use of the If statement it allows me to question the form to decide whether for in this instance the Length of textbox three is equal to 0 also known as an empty. If the textbox is empty it will notify the user and cancel any following code so no errors occur. If textbox is not empty</p>

<pre> vbInformation, "Validation Alert")     Exit Sub ElseIf Me.TextBox4.Text.Length = 0 Then     MsgBox("Please enter the distance between sites", vbInformation, "Validation Alert")     Exit Sub ElseIf Me.TextBox2.Text.Length = 0 Then     MsgBox("Please enter the registration plate", vbInformation, "Validation Alert")     Exit Sub ElseIf Not MaskedTextBox1.MaskCompleted Then     MsgBox("Please enter the time the vehicle passed site one", vbInformation, "Validation Alert")     Exit Sub ElseIf Not MaskedTextBox2.MaskCompleted Then     MsgBox("Please enter the time the vehicle passed site two", vbInformation, "Validation Alert")     Exit Sub End If </pre>	<p>then it will then decide if textbox four is empty and will continue asking these questions until the code is broken through an empty field, or the code will allow the rest of the code in the private sub routine to continue if all fields have valid data within it.</p>
<pre> timediff = DateDiff("s", Date1, Date2) averageSpeed = roadLength * 3600 / timediff Me.Label7.Text = averageSpeed &amp; "mph." </pre>	<p>This line of code works out the speed of the vehicle. It uses the formula speed = distance / time, however as the time difference is given in seconds "s" the time is multiplied by 3600 (60*60) so it will be able to change the time from seconds into minutes into hours so it can calculate the average speed of the vehicle between site one and site two in mph. After the speed of the vehicle is calculated the final speed of the vehicle is outputted to the user into a label with "mph" added on so the user knows the units of the speed. I needed this code because my criteria states that the form should be able to output the average speed of the vehicle to the user.</p>
<pre> If averageSpeed &gt; speedLimit Then     Me.Label8.Text = "The vehicle is " &amp; averageSpeed - speedLimit &amp; "mph over the limit."     MessageBox.Show("The vehicle is " &amp; averageSpeed - speedLimit &amp; "mph over the limit!", "Breaking Speed Alert") Else     MessageBox.Show("This vehicle is not over the speed limit!", "Alert")     Me.Label8.Text = speedLimit - averageSpeed &amp; "mph under the limit" End If </pre>	<p>Through the use of the If statement the form decides whether the vehicle is breaking the speed limit (entered by the user) and can output how many miles the car is over or under the limit into a clear label for the user to easily check. Even though this is not specified in the criteria set by the question, the user can now evaluate the speed of the vehicle effectively to the speed limit and is told how many miles over or under the limit the vehicle was.</p>

<pre>If speedLimit &lt; averageSpeed Then Me.ListBox1.Items.Add(regnum)</pre>	<p>This line of code outputs the registration plate of the vehicle to a listbox so the user can see whether the vehicle is breaking the law or if the vehicle is not breaking the law. This segment of code is needed as the criteria states that the form should be able to output the registration plate of the vehicle to a list of vehicles breaking the limit and a listbox can create a structured, neat list of data.</p>
---	--

## EFFICIENCY

---

```
Dim Date1 As Date
```

```
Dim Date2 As Date
```

```
Dim timediff As Double
```

```
Dim averageSpeed As Double
```

```
Dim roadLength As Double
```

```
Dim speedLimit As Double
```

```
Dim regnum As String
```

```
Dim roadName As String
```

I realised this way of declaring my variables as inefficient because there were many lines of code when there only needed to be one per data type. As I recognised that there was variables which could accommodate to the same data type I was able to put them on the same line so I modified my code to:

```
Dim Date1, Date2 As Date
```

```
Dim timediff, averageSpeed, roadLength As Double
```

```
Dim speedLimit As Double
```

```
Dim regnum, roadName As String
```

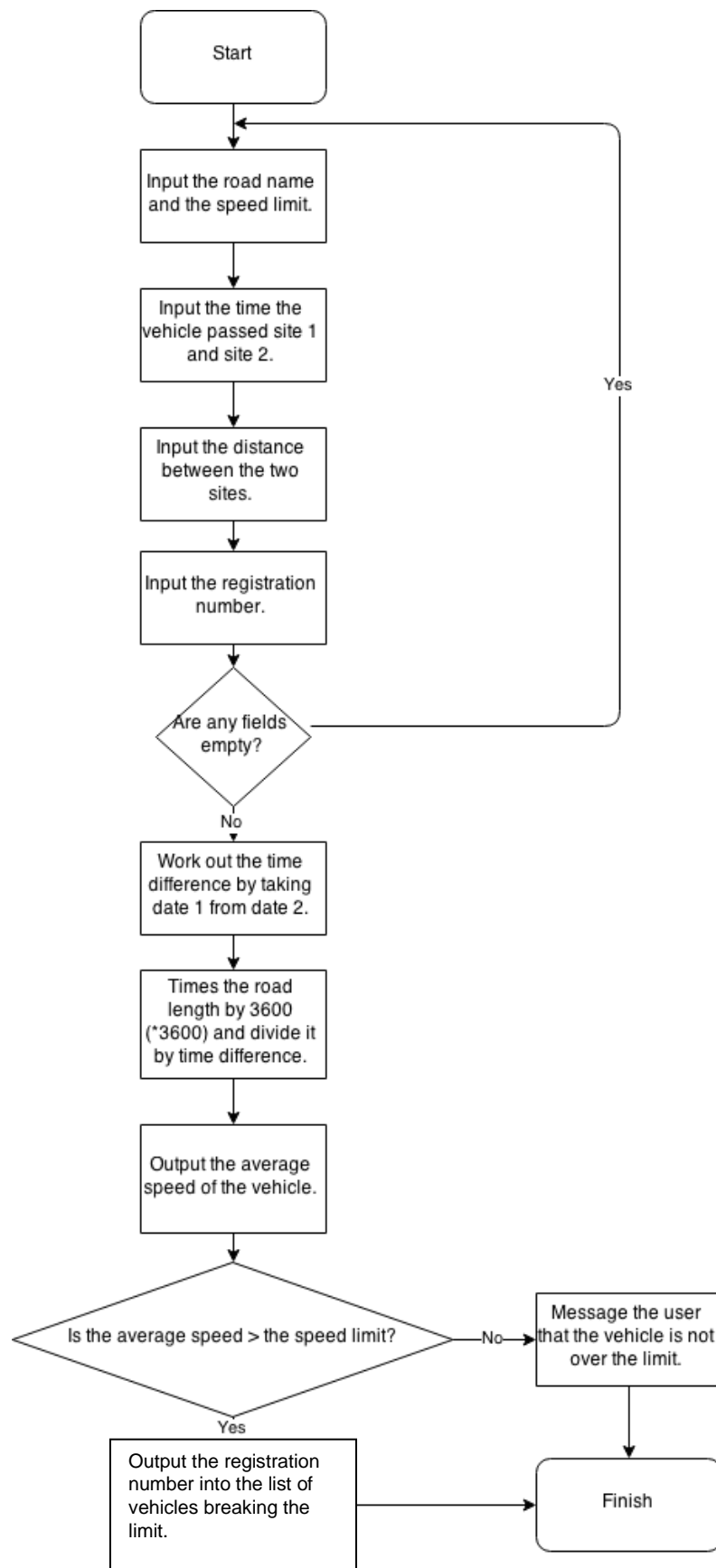
## INPUT AND OUTPUTS FOR TASK ONE

---

Inputs	Outputs
Name of the road.	The average speed of the vehicle.
Speed limit of the road.	The speed then vehicle was over the limit, if it was.
The time when the vehicle passed the initial site.	The registration of the vehicles that broke the speed limit into a listbox.
The time when the vehicle passed the final site.	
The distance between the two sites.	
The registration plate of the vehicle.	

FLOWCHART

---



## PSEUDO CODE

---

Start

Declare the variables date1 and date2 as date

Declare the variable regnum as String

Declare variables timeDiff, averageSpeed and roadLength as double

Set timeDiff = Date2 – Date1 in seconds

averageSpeed = roadLength \*60 \*60/ timeDiff

Return averageSpeed

If averageSpeed > Speed Limit

Add regnum to Listbox

Else

Alert “This vehicle is not over the speed limit”

Return output

Stop



## TESTING – ENTERING DATA

### REASONS FOR TESTING

Through testing, I am able to ensure that the final code for task one is working and is able to be edited to become more efficient later on. By testing if the user can do basic functions like enter the data onto the form such as the name of the road, the speed limit, the vehicles registration plate etc, it enables me to show testing that the form is functional as the basic components of the form are functional.

Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
001	Testing if the user can enter the name of the road.	Type the name of the road in the first textbox.	The road name will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 1)	No corrections were needed.
002	Testing if the user can enter the speed limit of the road.	Type the speed limit of the road in the second textbox.	The speed limit will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 2)	No corrections were needed.
003	Testing if the user can enter the time the vehicle passed site one.	Type the time the vehicle passed the first site in the third textbox.	The time will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 3)	No corrections were needed.
004	Testing if the user can enter the time the vehicle passed site two.	Type the time the vehicle passed the second site in the fourth textbox.	The time will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 4)	No corrections were needed.
005	Testing if the user can enter the distance between the sites.	Type the distance between the first and second site in the fifth textbox.	The distance between the sites will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 5)	No corrections were needed.

006	Testing if the user can enter the registration number.	Type the registration plate of the vehicle that is being assessed into the sixth textbox.	The registration plate of the vehicle will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 6)	No corrections were needed.
007	Testing if the reset function works.	Click the button which is labelled “reset”	The form will completely reset and all data inputted and outputted by the form will be reset.	The results were as expected. (Figure 7)	No corrections were needed.

## TESTING- CALCULATING SPEED

### REASONS FOR TESTING

Through testing I am able to show evidence that the calculations needed for task one are working efficiently. By testing the extremes such as 1mph over the limit and 1mph under the limit, it enables me to give good evidence that the solution to task one fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
008	Testing if the application can calculate the average speed of a vehicle and outputting the speed into a label.	Enter all necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two and submit the data.	The average speed of the vehicle will be outputted into a label which will tell the user the average speed of the vehicle in miles per hour.	The results were as expected. (Figure 8)	No corrections were needed.
009	Testing extremes- if the application can calculate the vehicle to be only 1mph over the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data.	As the vehicle is breaking the limit the form will subtract the speed limit from the average speed and output the speed over limit in the format "The vehicle is 1mph over the limit" onto a label.	The results were as expected. (Figure 9)	No corrections were needed.
010	Testing extremes- if the application can calculate the vehicles speed to be 1mph under the limit and recognise it is not breaking the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data.	As the vehicle is not breaking the speed limit the form will alert the user that the vehicles are not over the speed limit.	The results were as expected. (Figure 10)	No corrections were needed.

## TESTING- OUTPUTTING DATA

### REASONS FOR TESTING

Through testing I am able to show evidence that the form is correctly outputting data to the correct outputs. This testing is needed for task one as it gives proof that the code is working efficiently. By testing it enables me to give good evidence that the solution to task one fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
011	Testing to see if the form can recognise that the speed of the vehicle is 1mph under the limit and does not output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit, registration plate and submit the data.	As the average speed is not greater than the speed limit (average speed < speed limit) the form will alert the user with a message box that the vehicle is not breaking the limit and the registration plate will not be outputted to the listbox.	The results were as expected. (Figure 11)	No corrections were needed.
012	Testing to see if the form can recognise that the speed of the vehicle is 1mph over the limit and does output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, registration plate, speed limit and submit the data.	As the average speed is greater than the speed limit (average speed > speed limit) the registration plate entered by the user will be outputted into a listbox which is labelled "vehicles breaking the speed limit".	The form did not input the user's registration plate into the listbox. (Figure 12)	To resolve the solution I edited the code from "ListBox1.Text = regum" to "ListBox1.Items.Add(regnum)" so if the average speed of the vehicle was greater than the speed limit the registration plate would be added to the listbox. (Figure 12.1)

## TESTING- VALIDATION

### REASONS FOR TESTING

Through testing I am able to show evidence that the form is correctly validating empty fields or incorrectly inputted fields such as letters for the speed limit. This testing is needed for task one as it gives proof that the code is working efficiently. By testing it enables me to give good evidence that the solution to task one fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
V1	To test if the validation for the road name textbox works.	Enter all fields apart from the road name.	A message box will alert the user that the road name must be entered to continue.	The results were as expected. (Figure V1)	No corrections were needed.
V2	To test if the validation for the speed limit textbox works.	Enter all fields apart from the speed limit.	A message box will alert the user that the speed limit must be entered to continue.	The results were as expected. (Figure V2)	No corrections were needed.
V3	To test if the validation for the time passed site one masked textbox works.	Enter all fields apart from the time passed site one field.	A message box will alert the user that the time passed site one must be entered to continue.	The results were as expected. (Figure V3)	No corrections were needed.
V4	To test if the validation for the time passed site two masked textbox works.	Enter all fields apart from the time passed site two field.	A message box will alert the user that the time passed site two must be entered to continue.	The results were as expected. (Figure V4)	No corrections were needed.
V5	To test if the validation for the distance between sites textbox works.	Enter all fields apart from the distance between sites.	A message box will alert the user that the distance between sites must be entered to continue.	The results were as expected. (Figure V5)	No corrections were needed.

V6	To test if the validation for the registration plate textbox works.	Enter all fields apart from the registration plate.	A message box will alert the user that the registration plate must be entered to continue.	The results were as expected. (Figure V6)	No corrections were needed.
V7	To test if the user cannot enter numeric digits for the road name.	For the road name field enter "1".	A message box will appear alerting the user the road name is invalid.	The results were as expected. (Figure V7)	No corrections were needed.
V8	To test if the user cannot enter characters for the speed limit.	For the speed limit field enter "one".	A message box will appear alerting the user the speed limit is invalid.	The results were as expected. (Figure V8)	No corrections were needed.
V9	To test if the user cannot enter characters for the distance between sites.	For the distance between sites field enter "one".	A message box will appear alerting the user the distance between sites is invalid.	The results were as expected. (Figure V9)	No corrections were needed.

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### EVALUATION FOR TASK ONE

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I have modified my initial code to ensure that the final code that is produced is an efficient solution to the task. There is evidence of its efficiency through out as, I clearly declared variable in an efficient manner. Moreover, the time difference calculation to find out how long the vehicle took by calculating all the calculations at the same time rather than doing separate, continuous calculations. Overall the use of If statements allows me to tell the form to run a certain function if the user has entered something that can have two separate outcomes. So if the car is breaking the limit, it must send the registration plate to the listbox however if it is not breaking the speed limit run the else function set by the user. Furthermore, through using Listboxes I have created a clear layout to a working solution to allow the user to recognise the speed of the vehicle. For test 012, I had to amend my previous set code as it not function correctly and efficiently. By editing the code, it allowed me to make the form only output the plate IF the vehicle was breaking the limit and to allow several plates to be entered at once. By clearly for filling all criteria in the success criteria (page 4), it has enabled me to effectively convey a working, efficient solution to the task's requirements, so for example Test 008 refers to the fifth point on the success criteria. By testing, it helps me prove that the final solution is working and through screen-grabs it gives evidence that the final solution works in full efficiency. As the layout of the form is sensible with sensible name on button and labels for textbox's the end user will easily be able to understand the layout of the form and enter data in properly. Furthermore through validating the user's inputs it stops the form for crashing if the user forgets to enter valuable data such as the speed limit for the average speed calculation. By stopping the form from crashing due to incorrect data, the code is effectively working at an efficient rate.

---

### CONCLUSION FOR TASK ONE

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In conclusion I have successfully met the success criteria for Task One and my code functions effectively and efficiently. As the success criteria cover seven objectives the form should be able to do and as the form can surpass the requirements additional functions can be added to create efficiency within the code. The evidence shown through screenshots clearly conveys a working solution to the task and annotations of the code clearly explains the function of each line and how it is useful with the code. I can now state that my code is fully effective as it meets the task's requirements and is vividly displayed in the testing tables. Overall, my code is efficient as well as being user friendly due to clear layout and instructions for the user set by me.

## FINAL LAYOUT FOR TASK ONE

**Cars that break the limit**

Please enter the name of the road

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between the sites (miles)

Please enter the registration plate (no gaps)

Average speed of the car

Speed over the limit

List of vehicles breaking the limit  
ListBox1

Submit Data

Reset

The user enters the road name here

The user enters the speed limit here

The user enters the time the vehicle passed site 1.

The user enters the time the vehicle passed site 2.

The user enters the road length here

The user enters the registration plate here.

This button will calculate the speed of the vehicle and output relevant data to listboxes.

The speed of the vehicle will be outputted here.

The vehicles registration plate will be outputted to here if the vehicle is breaking the limit.

This button will reset the form.

The speed over the limit will be outputted here.



## FINAL CODE ANNOTATED FOR TASK ONE

---

```

Public Class Form1
    Dim Date1, Date2 As Date
    Dim timediff, averageSpeed, roadLength As Double
    Dim speedLimit As Double
    Dim regnum, roadName As String

    Sub Dimming()
        roadName = Me.TextBox1.Text
        speedLimit = Me.TextBox4.Text
        regnum = Me.TextBox2.Text
        Date1 = Me.MaskedTextBox1.Text
        Date2 = Me.MaskedTextBox2.Text
        roadLength = Me.TextBox3.Text
    End Sub

    Private Sub Button2_Click(sender As Object, e As EventArgs) Handles Button2.Click

        'This creates the reset button that will reset every textbox, listbox and label
        Controls.Clear()
        InitializeComponent()
    End Sub

    Private Sub Button3_Click(sender As Object, e As EventArgs) Handles Button3.Click
        Dimming()
        'This if statement validates if any fields are empty and breaks the code if there is
        'an empty field
        If Me.TextBox3.Text.Length = 0 Then
            'This creates the alert to alert the user that a field is empty
            MsgBox("Please enter the name of the road", vbInformation, "Validation Alert")
            'By leaving the sub it will stop further code, so it will not break later on
            Exit Sub
        ElseIf Me.TextBox1.Text.Length = 0 Then
            MsgBox("Please enter the speed limit", vbInformation, "Validation Alert")
            Exit Sub
        ElseIf Me.TextBox4.Text.Length = 0 Then
            MsgBox("Please enter the distance between sites", vbInformation,
"Validation Alert")
            Exit Sub
        ElseIf Me.TextBox2.Text.Length = 0 Then
            MsgBox("Please enter the registration plate", vbInformation, "Validation
Alert")
            Exit Sub
        ElseIf Not MaskedTextBox1.MaskCompleted Then
            MsgBox("Please enter the time the vehicle passed site one", vbInformation,
"Validation Alert")
            Exit Sub
        ElseIf Not MaskedTextBox2.MaskCompleted Then
            MsgBox("Please enter the time the vehicle passed site two", vbInformation,
"Validation Alert")
            Exit Sub
        End If

        'This if statement validates that the correct values are entered into the
        'textbox's e.g numerical values for speed limit
        If Not IsNumeric(Me.TextBox1.Text) Then

```

```

        MsgBox("Invalid data entered, Please enter numbers only for the speed
limit.", vbInformation, "Alert")
    Exit Sub
ElseIf IsNumeric(Me.TextBox3.Text) Then
    MsgBox("Invalid data entered, Please enter letters only for the road
name.", vbInformation, "Alert")
    Exit Sub
ElseIf Not IsNumeric(Me.TextBox4.Text) Then
    MsgBox("Invalid data entered, Please enter numbers only for the distance
between sites.", vbInformation, "Alert")
    Exit Sub
End If

'this creates the time difference between site 1 and 2
timediff = DateDiff("s", Date1, Date2)
'this calculates the average speed of the vehicle
averageSpeed = roadLength * 3600 / timediff
'This will output the speed of the vehicle
Me.Label7.Text = averageSpeed & "mph."
'This shows the user how many mph they vehicle was over the limit
If averageSpeed > speedLimit Then
Me.Label8.Text = "The vehicle is" & averageSpeed - speedLimit & "mph over the limit."
MessageBox.Show("The vehicle is " & averageSpeed - speedLimit & "mph over the limit!",
"Breaking Speed Alert")
Else
    MessageBox.Show("This vehicle is not over the speed limit!", "Alert")
    Me.Label8.Text = speedLimit - averageSpeed & "mph under the limit"
End If

If speedLimit < averageSpeed Then
Me.ListBox1.Items.Add(regnum)

Private Sub TextBox2_TextChanged(sender As Object, e As EventArgs) Handles
TextBox2.TextChanged

'this makes the registration number textbox all uppercase letters
    Me.TextBox2.CharacterCasing = CharacterCasing.Upper
End Sub
End Class

```

## TASK TWO

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### INTRODUCTION TO TASK TWO

---

In Task Two, the specification asks to for the form to be able to recognise the difference between a standard registration plate and a non-standard/custom registration plate. The form should be able to output whether it believes the registration plate of the vehicle breaking the speed limit follows the standard format-Letter, Letter, Number, Number, Letter, Letter, Letter e.g. “AA00 AAA” which cars have used since 2001 or the previous format used from 1983-2001-Letter, Number, Number, Number, Letter, Letter, Letter e.g. “A000 AAA”. The form should be able to output data which tells the user whether the plate is standard or non-standard by following the formats.

### SUCCESS CRITERIA

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- The system must be able to meet all requirements in Task One’s success criteria.
- Must be able to recognise non-standard registration plates.
- Must be able to tell the user whether the plate is standard or non-standard/customized.

### EVIDENCE OF MY PLANNING

---

Please enter the location of site	<input type="text"/>
Please enter the speed limit (mph)	<input type="text"/>
Please enter time the car passed Site 1	<input type="text"/>
Please enter time the car passed Site 2	<input type="text"/>
Please enter the distance of Site 1-Site 2(miles)	<input type="text"/>
Please enter registration number of vehicle	<input type="text"/>

Vehicles breaking the limit	Is the plate standard?	Speed over Limit	<input type="button" value="Submit"/> <input type="button" value="Reset"/>
<input type="text"/>	<input type="text"/>	Average Speed of the Car	

## TEST PLAN

### TASK TWO - TEST PLAN 1 – ENTERING DATA

Test Reference	Reason for Test	Test Instructions	Expected Result
013	Testing if the user can enter the name of the road.	Type the name of the road in the first textbox.	The road name will appear in the textbox and will not be deleted are being entered.
014	Testing if the user can enter the speed limit of the road.	Type the speed limit of the road in the second textbox.	The speed limit will appear in the textbox and will not be deleted are being entered.
015	Testing if the user can enter the time the vehicle passed site one.	Type the time the vehicle passed the first site in the third textbox.	The time will appear in the textbox and will not be deleted are being entered.
016	Testing if the user can enter the time the vehicle passed site two.	Type the time the vehicle passed the second site in the fourth textbox.	The time will appear in the textbox and will not be deleted are being entered.
017	Testing if the user can enter the distance between the sites.	Type the distance between the first and second site in the fifth textbox.	The distance between the sites will appear in the textbox and will not be deleted are being entered.
018	Testing if the user can enter the registration number.	Type the registration plate of the vehicle that is being assessed into the sixth textbox.	The registration plate of the vehicle will appear in the textbox and will not be deleted are being entered.
019	Testing if the reset function works.	Click the button which is labelled “reset”	The form will completely reset and all data inputted and outputted by the form will be reset.

---

**TASK TWO- TEST PLAN 2- CALCULATING SPEED**


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<b>Test Reference</b>	<b>Reason for Test</b>	<b>Test Instructions</b>	<b>Expected Result</b>
020	Testing if the application can calculate the average speed of a vehicle and outputting the speed into a label.	Enter all necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two and submit the data.	The average speed of the vehicle will be outputted into a label which will tell the user the average speed of the vehicle in miles per hour.
021	Testing extremes- if the application can calculate the vehicle to be only 1mph over the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data.	As the vehicle is breaking the limit the form will subtract the speed limit from the average speed and output the speed over limit in the format "The vehicle is 1mph over the limit" onto a label.
022	Testing extremes- if the application can calculate the vehicles speed to be 1mph under the limit and recognise it is not breaking the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data.	As the vehicle is not breaking the speed limit the form will alert the user that the vehicles is not over the speed limit.

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**TASK TWO-TEST PLAN 3- OUTPUTTING DATA**


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<b>Test Reference</b>	<b>Reason for Test</b>	<b>Test Instructions</b>	<b>Expected Result</b>
023	Testing to see if the form can recognise that the speed of the vehicle is 1mph under the limit and does not output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit, registration plate and submit the data.	As the average speed is not greater than the speed limit (average speed < speed limit) the form will alert the user with a message box that the vehicle is not breaking the limit and the registration plate will not be outputted to the listbox.
024	Testing to see if the form can recognise that the speed of the vehicle is 1mph over the limit and does output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, registration plate, speed limit and submit the data.	As the average speed is greater than the speed limit (average speed > speed limit) the registration plate entered by the user will be outputted into a listbox which is labelled "vehicles breaking the speed limit".
025	Testing if the form can recognise that the plate "AA00AAA" is a standard plate and output "standard" in a listbox	Enter the registration plate as "AA00AAA"	The listbox labelled "Plate recognition" recognises the plate is standard and outputs standard.
026	Testing if the form can recognise that the plate "A000AAA" is a standard plate and output "standard" in a listbox	Enter the registration plate as "A000AAA"	The listbox labelled "Plate recognition" recognises the plate is standard and outputs standard.
027	Testing if the form can recognise that the plate "TMAG" is a non-standard plate and output "non-standard" in a listbox	Enter the registration plate as "TMAG"	The listbox labelled "Plate recognition" recognises the plate is non-standard and outputs non-standard into the listbox.
028	Testing if the form only enters whether the plate is standard or non-standard when the car is breaking the limit.	Enter the registration plate and make the speed limit greater than the speed of the vehicle.	The form will not output whether the plate or non-standard as the vehicle is not breaking the limit.

---

**TASK TWO-TEST PLAN 4- VALIDATION**


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<b>Test Reference</b>	<b>Reason for Test</b>	<b>Test Instructions</b>	<b>Expected Result</b>
V10	To test if the validation for the road name textbox works.	Enter all fields apart from the road name.	A message box will alert the user that the road name must be entered to continue.
V11	To test if the validation for the speed limit textbox works.	Enter all fields apart from the speed limit.	A message box will alert the user that the speed limit must be entered to continue.
V12	To test if the validation for the time passed site one masked textbox works.	Enter all fields apart from the time passed site one field.	A message box will alert the user that the time passed site one must be entered to continue.
V13	To test if the validation for the time passed site two masked textbox works.	Enter all fields apart from the time passed site two field.	A message box will alert the user that the time passed site two must be entered to continue.
V14	To test if the validation for the distance between sites textbox works.	Enter all fields apart from the distance between sites.	A message box will alert the user that the distance between sites must be entered to continue.
V15	To test if the validation for the registration plate textbox works.	Enter all fields apart from the registration plate.	A message box will alert the user that the registration plate must be entered to continue.
V16	To test if the user cannot enter numeric digits for the road name.	For the road name field enter "1".	A message box will appear alerting the user the road name is invalid.
V17	To test if the user cannot enter characters for the speed limit.	For the speed limit field enter "one".	A message box will appear alerting the user the speed limit is invalid.
V18	To test if the user cannot enter characters for the distance between sites.	For the distance between sites field enter "one".	A message box will appear alerting the user the distance between sites is invalid.

## IMPLEMENTATION FOR TASK TWO

<pre> Dim Date1, Date2 As Date Dim timediff, averageSpeed, roadLength As Double Dim speedLimit As Double Dim regnum, roadName As String </pre>	<p>These are the variables which are going to be used throughout the code to create efficiency within the code. Date1 and Date2 are both set as Date variables due to the fact that the function, DateDiff will only works if it the variables being entered by the user are of the formatting of a time/date. Moreover, the speedLimit, roadLength and time difference is set as a double variable because it will be able to accommodate for a large and small magnitudes for the number. I have chosen to use string for the registration plate and it consists of numerical value as characters e.g. "AA00AAA" and string can accommodate for this. As it can accommodate for a string of characters I chose to use the data type string for the name of the road. Finally I chose to use double for the averageSpeed instead of Integer as the</p>
<pre> Sub Dimming() roadName = Me.TextBox1.Text speedLimit = Me.TextBox4.Text regnum = Me.TextBox2.Text Date1 = Me.MaskedTextBox1.Text Date2 = Me.MaskedTextBox2.Text roadLength = Me.TextBox3.Text End Sub </pre>	<p>The variable Date1 is what the user will enter as the first time reading used in the calculation which is the time the vehicle passed the first site. Whatever is entered into MaskedTextBox1 and MaskedTextBox2 will be stored in the program as the Date1 and Date2 as in the public sub routine, I have stated that the user's input for MaskedTextBox1 and MaskedTextBox2 will equal the variables Date1 and Date2. This is the same for speedLimit, regnum, roadLength and roadName so if I but Dimming( ) into a private sub routine it will be able to use this for all the variables.</p>
<pre> Controls.Clear() InitializeComponent() </pre>	<p>This code allows the user to reset all the values that they have inputted into the form and allows them to reset all outputs given out by the form. The Controls.Clear is set to clear all fields which include Textboxes, MaskedTextboxes and Listboxes as well as labels. The second line Initializes the reset so all inputted and outputted data is lost.</p>
<pre> If Me.TextBox3.Text.Length = 0 Then MsgBox("Please enter the name of the road", vbInformation, "Validation Alert") Exit Sub ElseIf Me.TextBox1.Text.Length = 0 Then  MsgBox("Please enter the speed limit", vbInformation, "Validation Alert") </pre>	<p>Through the use of the If statement it allows me to question the form to decide whether for in this instance the Length of textbox three is equal to 0 also known as an empty. If the textbox is empty it will notify the user and cancel any following code so no errors occur. If textbox is not empty then it will then decide if textbox four is</p>



<pre> Exit Sub ElseIf Me.TextBox4.Text.Length = 0 Then     MsgBox("Please enter the distance between sites", vbInformation, "Validation Alert") Exit Sub ElseIf Me.TextBox2.Text.Length = 0 Then     MsgBox("Please enter the registration plate", vbInformation, "Validation Alert") Exit Sub ElseIf Not MaskedTextBox1.MaskCompleted Then     MsgBox("Please enter the time the vehicle passed site one", vbInformation, "Validation Alert") Exit Sub ElseIf Not MaskedTextBox2.MaskCompleted Then     MsgBox("Please enter the time the vehicle passed site two", vbInformation, "Validation Alert") Exit Sub End If </pre>	<p>empty and will continue asking these questions until the code is broken through an empty field, or the code will allow the rest of the code in the private sub routine to continue if all fields have valid data within it.</p>
<pre> timediff = DateDiff("s", Date1, Date2) averageSpeed = roadLength * 3600 / timediff Me.Label7.Text = averageSpeed &amp; "mph." </pre>	<p>This line of code works out the speed of the vehicle. It uses the formula <math>\text{speed} = \text{distance} / \text{time}</math>, however as the time difference is given in seconds "s" the time is multiplied by 3600 (60*60) so it will be able to change the time from seconds into minutes into hours so it can calculate the average speed of the vehicle between site one and site two in mph. After the speed of the vehicle is calculated the final speed of the vehicle is outputted to the user into a label with "mph" added on so the user knows the units of the speed. I needed this code because my criteria states that the form should be able to output the average speed of the vehicle to the user.</p>
<pre> If averageSpeed &gt; speedLimit Then     Me.Label8.Text = "The vehicle is " &amp; averageSpeed - speedLimit &amp; "mph over the limit."     MessageBox.Show("The vehicle is " &amp; averageSpeed - speedLimit &amp; "mph over the limit!", "Breaking Speed Alert") Else     MessageBox.Show("This vehicle is not over the speed limit!", "Alert")     Me.Label8.Text = speedLimit - averageSpeed &amp; "mph under the limit" End If </pre>	<p>Through the use of the If statement the form decides whether the vehicle is breaking the speed limit (entered by the user) and can output how many miles the car is over or under the limit into a clear label for the user to easily check. Even though this is not specified in the criteria set by the question, the user can now evaluate the speed of the vehicle effectively to the speed limit and is told how many miles over or under the limit the vehicle was.</p>

<pre>If speedLimit &lt; averageSpeed Then Me.ListBox1.Items.Add(regnum)</pre>	<p>This line of code outputs the registration plate of the vehicle to a listbox so the user can see whether the vehicle is breaking the law or if the vehicle is not breaking the law. This segment of code is needed as the criteria states that the form should be able to output the registration plate of the vehicle to a list of vehicles breaking the limit and a listbox can create a structured, neat list of data.</p>
<pre>        If speedLimit &lt; averageSpeed Then             Me.ListBox1.Items.Add(regnum)  Me.ListBox2.Items.Add(averageSpeed)  Me.ListBox3.Items.Add(averageSpeed - speedLimit &amp; "mph over the limit")         End If</pre>	
<pre>If speedLimit &lt; averageSpeed Then     If UCase\$(regnum) Like "[A-Z][A-Z][0-9][0-9][A-Z][A-Z][A-Z]" Or     UCase\$(regnum) Like "[A-Z][0-9][0-9][0-9][A-Z][A-Z][A-Z]" Then</pre>	
<pre>Me.ListBox4.Items.Add("Standard Plate")     standardCheck = "standard" Else     Me.ListBox4.Items.Add("Non-Standard Plate")     standardCheck = "nonstandard" End If End If</pre>	

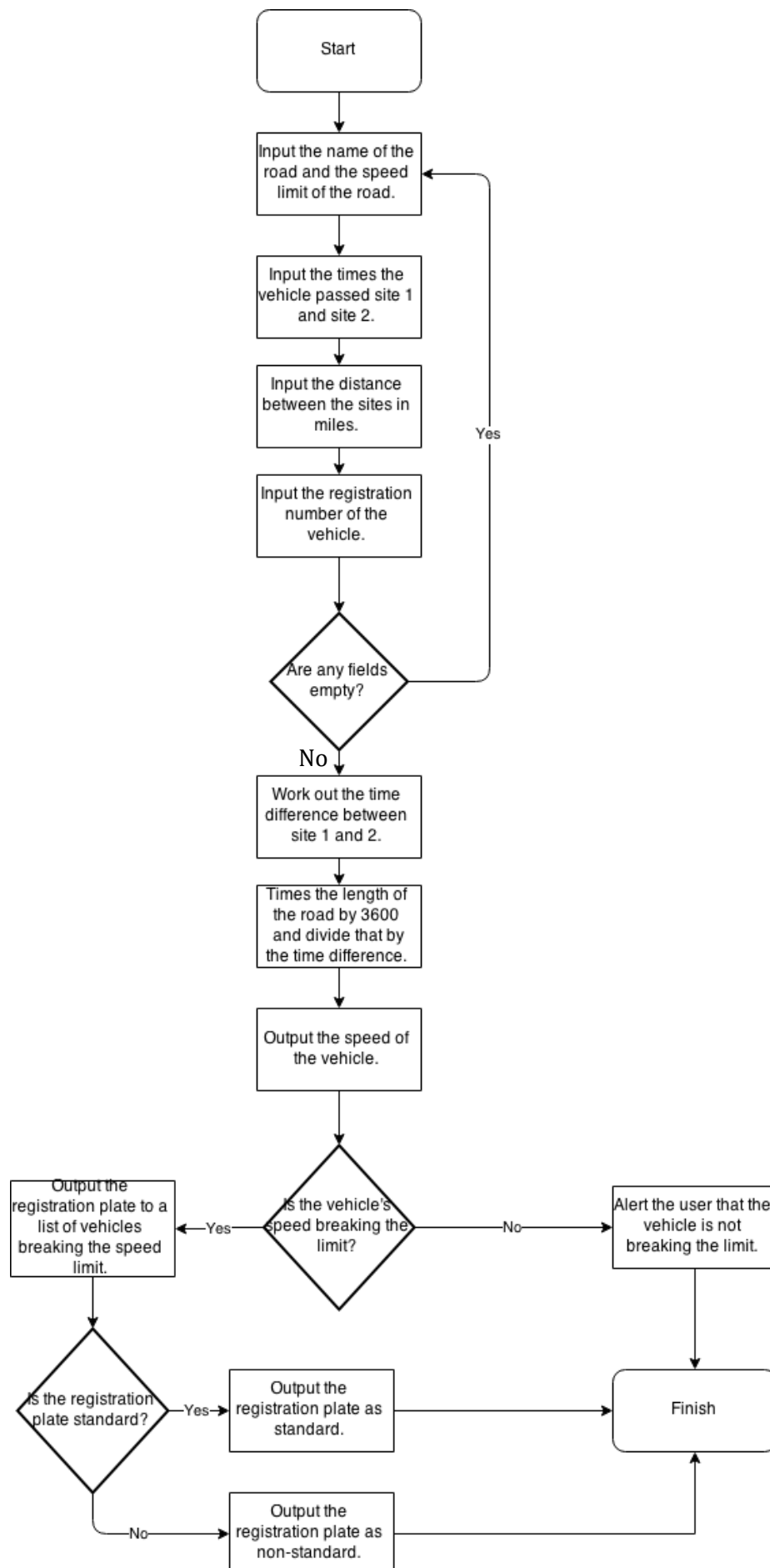
---

**INPUTS AND OUTPUTS FOR TASK TWO**

---

Inputs	Outputs
Name of the road.	The average speed of the vehicle.
Speed limit of the road.	The speed then vehicle was over the limit, if it was.
The time when the vehicle passed the initial site.	The registration of the vehicles that broke the speed limit into a listbox.
The time when the vehicle passed the final site.	Whether the plate is standard or non-standard / custom
The distance between the two sites.	
The registration plate of the vehicle.	

## FLOWCHART



## PSEUDO CODE

---

Start

Declare the variables date1 and date2 as date

Declare the variable regnum as String

Declare variables timeDiff, averageSpeed and roadLength as double

Set timeDiff = Date2 – Date1 in seconds

averageSpeed = roadLength \*60 \*60/ timeDiff

Return averageSpeed

If averageSpeed > Speed Limit

Add regnum to Listbox

Else

Alert “This vehicle is not over the speed limit”

If average speed > speed limit then

If regnum fits mask of is “[A-Z] [A-Z] [0-9] [0-9] [A-Z] [A-Z] [A-Z]” or

“[A-Z] [A-Z] [0-9] [0-9] [A-Z] [A-Z] [A-Z] then

Listbox= the plate is standard.

Else

Listbox = the plate is not standard.

Stop

## TESTING-ENTERING DATA

### REASON FOR TESTING

Through testing, I am able to ensure that the final code for task two is working and is able to be edited to become more efficient later on. By testing if the user can do basic functions like enter the data onto the form such as the name of the road, the speed limit, the vehicles registration plate etc, it enables me to show testing that the form is functional as the basic components of the form are functional.

Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
013	Testing if the user can enter the name of the road.	Type the name of the road in the first textbox.	The road name will appear in the textbox and will not be deleted after being entered.	The results were as expected. (Figure 13)	No corrections were made.
014	Testing if the user can enter the speed limit of the road.	Type the speed limit of the road in the second textbox.	The speed limit will appear in the textbox and will not be deleted after being entered.	The results were as expected. (Figure 14)	No corrections were made.
015	Testing if the user can enter the time the vehicle passed site one.	Type the time the vehicle passed the first site in the third textbox.	The time will appear in the textbox and will not be deleted after being entered.	The results were as expected. (Figure 15)	No corrections were made.
016	Testing if the user can enter the time the vehicle passed site two.	Type the time the vehicle passed the second site in the fourth textbox.	The time will appear in the textbox and will not be deleted after being entered.	The results were as expected. (Figure 16)	No corrections were made.
017	Testing if the user can enter the distance between the sites.	Type the distance between the first and second site in the fifth textbox.	The distance between the sites will appear in the textbox and will not be deleted after being entered.	The results were as expected. (Figure 17)	No corrections were made.
018	Testing if the	Type the	The registration	The results were as	No

	user can enter the registration number.	registration plate of the vehicle that is being assessed into the sixth textbox.	plate of the vehicle will appear in the textbox and will not be deleted after being entered.	expected. (Figure 18)	corrections were made.
019	Testing if the reset function works.	Click the button which is labelled "reset"	The form will completely reset and all data inputted and outputted by the form will be reset.		

## TESTING-CALCULATING SPEED

### REASON FOR TESTING

Through testing I am able to show evidence that the calculations needed for task two continue to work efficiently. By testing the extremes such as 1mph over the limit and 1mph under the limit, it enables me to give good evidence that the solution to task two fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
020	Testing if the application can calculate the average speed of a vehicle and outputting the speed into a label.	Enter all necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two and submit the data.	The average speed of the vehicle will be outputted into a label which will tell the user the average speed of the vehicle in miles per hour.	The results were as expected. (Figure 20)	No corrections were made.
021	Testing extremes- if the application can calculate the vehicle to be only 1mph over the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data.	As the vehicle is breaking the limit the form will subtract the speed limit from the average speed and output the speed over limit in the format "The vehicle is 1mph over the limit" onto a label.	The results were as expected. (Figure 21)	No corrections were made.
022	Testing extremes- if the application can calculate the vehicles speed to be 1mph under the limit and recognise it is not breaking the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data.	As the vehicle is not breaking the speed limit the form will alert the user that the vehicles is not over the speed limit.	The results were as expected. (Figure 22)	No corrections were made.



## TESTING-OUTPUTTING DATA

### REASON FOR TESTING

Through testing I am able to show evidence that the form is correctly outputting data to the correct outputs. This testing is needed for task two as it gives proof that the code is working efficiently. By testing it enables me to give good evidence that the solution to task two fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
023	Testing to see if the form can recognise that the speed of the vehicle is 1mph under the limit and does not output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit, registration plate and submit the data.	As the average speed is not greater than the speed limit (average speed < speed limit) the form will alert the user with a message box that the vehicle is not breaking the limit and the registration plate will not be outputted to the listbox.	The results were as expected. (Figure 23)	No corrections were made.
024	Testing to see if the form can recognise that the speed of the vehicle is 1mph over the limit and does output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, registration plate, speed limit and submit the data.	As the average speed is greater than the speed limit (average speed > speed limit) the registration plate entered by the user will be outputted into a listbox which is labelled "vehicles breaking the speed limit".	The results were as expected. (Figure 24)	No corrections were made.
025	Testing if the form can recognise that the plate "AA00AAA" is a standard plate and output "standard" in a listbox	Enter the registration plate as "AA00AAA"	The listbox labelled "Plate recognition" recognises the plate is standard and outputs standard.	The results were as expected. (Figure 25)	No corrections were made.

026	Testing if the form can recognise that the plate "A000AAA" is a standard plate and output "standard" in a listbox	Enter the registration plate as "A000AAA"	The listbox labelled "Plate recognition" recognises the plate is standard and outputs standard.	The results were as expected. (Figure 26)	No corrections were made.
027	Testing if the form can recognise that the plate "TMAG" is a non-standard plate and output "non-standard" in a listbox	Enter the registration plate as "TMAG"	The listbox labelled "Plate recognition" recognises the plate is non-standard and outputs non-standard into the listbox.	The results were as expected. (Figure 27)	No corrections were made.
028	Testing if the form only enters whether the plate is standard or non-standard when the car is breaking the limit.	Enter the registration plate and make the speed limit greater than the speed of the vehicle.	The form will not output whether the plate or non-standard as the vehicle is not breaking the limit.	The form outputted the plate's format to the listbox, even though the vehicle was not over the limit.  (Figure 28)	By adding an 'If' statement to question whether the plate is standard or not the result was as expected.  (Figure 28.1)

## TESTING- VALIDATION

### REASONS FOR TESTING

Through testing I am able to show evidence that the form is correctly validating empty fields or incorrectly inputted fields such as letters for the speed limit. This testing is needed for task two as it gives proof that the code is working efficiently. By testing it enables me to give good evidence that the solution to task one fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
V10	To test if the validation for the road name textbox works.	Enter all fields apart from the road name.	A message box will alert the user that the road name must be entered to continue.	The results were as expected. (Figure V10)	No corrections were needed.
V11	To test if the validation for the speed limit textbox works.	Enter all fields apart from the speed limit.	A message box will alert the user that the speed limit must be entered to continue.	The results were as expected. (Figure V11)	No corrections were needed.
V12	To test if the validation for the time passed site one masked textbox works.	Enter all fields apart from the time passed site one field.	A message box will alert the user that the time passed site one must be entered to continue.	The results were as expected. (Figure V12)	No corrections were needed.
V13	To test if the validation for the time passed site two masked textbox works.	Enter all fields apart from the time passed site two field.	A message box will alert the user that the time passed site two must be entered to continue.	The results were as expected. (Figure V13)	No corrections were needed.
V14	To test if the validation for the distance between sites textbox works.	Enter all fields apart from the distance between sites.	A message box will alert the user that the distance between sites must be entered to continue.	The results were as expected. (Figure V14)	No corrections were needed.

V15	To test if the validation for the registration plate textbox works.	Enter all fields apart from the registration plate.	A message box will alert the user that the registration plate must be entered to continue.	The results were as expected. (Figure V15)	No corrections were needed.
V16	To test if the user cannot enter numeric digits for the road name.	For the road name field enter "1".	A message box will appear alerting the user the road name is invalid.	The results were as expected. (Figure V16)	No corrections were needed.
V17	To test if the user cannot enter characters for the speed limit.	For the speed limit field enter "one".	A message box will appear alerting the user the speed limit is invalid.	The results were as expected. (Figure V17)	No corrections were needed.
V18	To test if the user cannot enter characters for the distance between sites.	For the distance between sites field enter "one".	A message box will appear alerting the user the distance between sites is invalid.	The results were as expected. (Figure V18)	No corrections were needed.

## EVALUATION FOR TASK TWO

I have modified my initial code to ensure that the final code that is produced is an efficient solution to the tasks. There is evidence of its efficiency through out as, I clearly declared variable in an efficient manner. Moreover, the time difference calculation to find out how long the vehicle took by calculating all the calculations at the same time rather than doing separate, continuous calculations. Overall the use of If statements allows me to tell the form to run a certain function if the user has entered something that can have two separate outcomes. So if the car is breaking the limit, it must send the registration plate to the listbox however if it is not breaking the speed limit run the else function set by the user. Furthermore, through using Ucase I have created an efficient, working solution to allow the form to recognise standard and non-standard plates. For test 028, I had to amend my previous set code as it not function correctly and efficiently. By adding the additional If statement, it allowed me to make the form only output the plate's format IF the vehicle was breaking the limit. By clearly for filling all criteria in the success criteria (page 17), it has enabled me to effectively convey a working, efficient solution to the task's requirements, so for example Test 028 refers to the third point on the success criteria. By testing, it helps me prove that the final solution is working and through screen-grabs it gives evidence that the final solution works in full efficiency. As the layout of the form is sensible with sensible name on button and labels for textbox's the end user will easily be able to understand the layout of the form and enter data in properly. Furthermore through validating the user's inputs it stops the form for crashing if the user forgets to enter valuable data such as the speed limit for the average speed calculation. By stopping the form from crashing due to incorrect data, the code is effectively working at an efficient rate.

## CONCLUSION FOR TASK TWO

In conclusion I have successfully met the success criteria for Task One and Task Two and my code functions effectively and efficiently. As the success criteria covers eight objectives the form should be able to do and as the form can surpass the requirements additional functions can be added to create efficiency within the code. The evidence shown through screenshots clearly conveys a working solution to the task and annotations of the code clearly explains the function of each line and how it is useful with the code. I can now state that my code is fully effective as it meets the task's requirements and is vividly portrayed in the testing tables. Overall, my code is efficient as well as being user friendly due to clear layout and instructions for the user set by me.

## FINAL LAYOUT FOR TASK TWO

The screenshot shows a Windows application window titled "Cars that break the limit". The interface includes the following elements and annotations:

- Input Fields:**
  - "Please enter the name of the road" (Text box) - Annotation: "The user enters the road name here"
  - "Please enter the speed limit (mph)" (Text box) - Annotation: "The user enters the speed limit here"
  - "Enter the time vehicle passed site 1" (Time picker) - Annotation: "The user enters the time the vehicle passed site 1."
  - "Enter the time vehicle passed site 2" (Time picker) - Annotation: "The user enters the time the vehicle passed site 2."
  - "Please enter the distance between the sites (miles)" (Text box) - Annotation: "The user enters the road length here"
  - "Please enter the registration plate (no gaps)" (Text box) - Annotation: "The user enters the registration plate here."
- Output/Status Area:**
  - "List of vehicles breaking the limit" (Label) above "ListBox1" - Annotation: "The vehicles registration plate will be outputted to here if the vehicle is breaking the limit."
  - "Plate format" (Label) above "ListBox2" - Annotation: "The plate's format will be outputted here so if the plate is standard the list box will say it is standard."
  - "Average speed of the car" (Text label) - Annotation: "The speed of the vehicle will be outputted here."
  - "Speed over the limit" (Text label) - Annotation: "The speed over the limit will be outputted here."
- Buttons:**
  - "Submit Data" - Annotation: "This button will calculate the speed of the vehicle and output relevant data to listboxes."
  - "Reset" - Annotation: "This button will reset the form."

## FINAL CODE ANNOTATED FOR TASK TWO

---

```

Public Class Form1
    'This declares all variables publicly so all subs can see these variables.
    Dim Date1, Date2 As Date
    Dim timediff, averageSpeed, roadLength, speedLimit As Double
    Dim roadName, firstName, surname, homeAddress, standardCheck, regnum, title As String

    Sub Dimming()
        'This declares all variables in one sub and can be enabled in all subs. This is used
        'for efficiency
        roadName = Me.TextBox3.Text
        speedLimit = Me.TextBox1.Text
        regnum = Me.TextBox2.Text
        Date1 = Me.MaskedTextBox1.Text
        Date2 = Me.MaskedTextBox2.Text
        roadLength = Me.TextBox4.Text
    End Sub

    Private Sub Button3_Click(sender As Object, e As EventArgs) Handles Button3.Click
        Dimming()
        'This if statement validates if any fields are empty and breaks the code if there is
        'an empty field
        If Me.TextBox3.Text.Length = 0 Then
            'This creates the alert to alert the user that a field is empty
            MsgBox("Please enter the name of the road", vbInformation, "Validation Alert")
            'By leaving the sub it will stop further code, so it will not break later on
            Exit Sub
        ElseIf Me.TextBox1.Text.Length = 0 Then
            MsgBox("Please enter the speed limit", vbInformation, "Validation Alert")
            Exit Sub
        ElseIf Me.TextBox4.Text.Length = 0 Then
            MsgBox("Please enter the distance between sites", vbInformation,
            "Validation Alert")
            Exit Sub
        ElseIf Me.TextBox2.Text.Length = 0 Then
            MsgBox("Please enter the registration plate", vbInformation, "Validation
            Alert")
            Exit Sub
        ElseIf Not MaskedTextBox1.MaskCompleted Then
            MsgBox("Please enter the time the vehicle passed site one", vbInformation,
            "Validation Alert")
            Exit Sub
        ElseIf Not MaskedTextBox2.MaskCompleted Then
            MsgBox("Please enter the time the vehicle passed site two", vbInformation,
            "Validation Alert")
            Exit Sub
        End If

        'This if statement validates that the correct values are entered into the
        'textbox's e.g numerical values for speed limit
        If Not IsNumeric(Me.TextBox1.Text) Then
            MsgBox("Invalid data entered, Please enter numbers only for the speed
            limit.", vbInformation, "Alert")
            Exit Sub
        ElseIf IsNumeric(Me.TextBox3.Text) Then
            MsgBox("Invalid data entered, Please enter letters only for the road
            name.", vbInformation, "Alert")
            Exit Sub
        ElseIf Not IsNumeric(Me.TextBox4.Text) Then

```

```

        MsgBox("Invalid data entered, Please enter numbers only for the distance
between sites.", vbInformation, "Alert")
    Exit Sub
End If

'This creates the time difference between date1 and date2
timediff = DateDiff("s", Date1, Date2)
'This calculates the average speed of the vehicle I used one calculation for
efficiency.
averageSpeed = roadLength * 3600 / timediff
'This will output the speed of the vehicle efficiently
MessageBox.Show("The speed of the vehicle is " & averageSpeed & "mph", "The
speed of the vehicle")
'This shows the user the mph the vehicle was over the limit
If averageSpeed > speedLimit Then
    MessageBox.Show("The vehicle is " & averageSpeed - speedLimit & "mph over
the limit!", "Breaking Speed Alert")
Else
    MessageBox.Show("The vehicle is not breaking the speed limit", "Alert")
End If
'This sends data to the listboxs so the user can look at all necessary data
If speedLimit < averageSpeed Then
    Me.ListBox1.Items.Add(regnum)
    Me.ListBox2.Items.Add(averageSpeed)
    Me.ListBox3.Items.Add(averageSpeed - speedLimit & "mph over the limit")
End If

'This checks whether the registration number fits the standard mask from 2001- and the
original mask used from 1983 - 2001

If speedLimit < averageSpeed Then
    If UCase$(regnum) Like "[A-Z][A-Z][0-9][0-9][A-Z][A-Z][A-Z]" Or
UCase$(regnum) Like "[A-Z][0-9][0-9][0-9][A-Z][A-Z][A-Z]" Then
        Me.ListBox4.Items.Add("Standard Plate")
        standardCheck = "standard"
    Else
        Me.ListBox4.Items.Add("Non-Standard Plate")
        standardCheck = "nonstandard"
    End If
End If
End Sub

Private Sub TextBox2_TextChanged(sender As Object, e As EventArgs) Handles
TextBox2.TextChanged
    'This makes the registration number textbox all uppercase letters
    Me.TextBox2.CharacterCasing = CharacterCasing.Upper
End Sub

Private Sub Button2_Click(sender As Object, e As EventArgs) Handles Button2.Click
    'This creates the reset button that will reset every textbox and listbox
    Controls.Clear()
    InitializeComponent()
End Sub
End Class

```

## TASK THREE

### INTRODUCTION

In Task Three, the specification asks for the form to be able to gather data about the driver from a CSV and output all data to a CSV. The form should be able to output whether it believes the registration plate of the vehicle breaking the speed limit follows the standard or non-standard plate format and output data such as the driver's name, title, surname, address and the speed the driver was going at and any other relevant information e.g. speed the driver was over the limit. The form should be able to gather relevant information from a CSV and output the information to the user. The form should also be able to send vehicles with a standard license plate to a separate CSV than non-standard plates for efficiency and a clear layout.

### SUCCESS CRITERIA

- The system must meet all requirements of Task One's success criteria.
- The system must meet all requirements of Task Two's success criteria.
- Must be able to send vehicles with standard registration plates to a separate CSV than vehicles without standard number plates.
- Must be able to send vehicles that broke the limit to be sent to a CSV.
- The form must be able to gather information about the driver from a CSV such as title, first name, surname, address and any other relevant information.

### EVIDENCE OF MY PLANNING

Please enter the name of the road	<input type="text"/>		
Please enter the speed limit (mph)	<input type="text"/>		
Please enter time the car passed Site 1	<input type="text"/>	<input type="text"/>	<input type="text"/>
Please enter time the car passed Site 2	<input type="text"/>	<input type="text"/>	<input type="text"/>
Please enter the distance of Site 1-Site 2(miles)	<input type="text"/>		
Please enter registration number of vehicle	<input type="text"/>		

Vehicles breaking the limit	Average Speed	Speed over Limit	Is the plate standard?
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



## TEST PLAN

### TASK THREE- TEST PLAN 1 – ENTERING DATA

Test Reference	Reason for Test	Test Instructions	Expected Result
029	Testing if the user can enter the name of the road.	Type the name of the road in the first textbox.	The road name will appear in the textbox and will not be deleted are being entered.
030	Testing if the user can enter the speed limit of the road.	Type the speed limit of the road in the second textbox.	The speed limit will appear in the textbox and will not be deleted are being entered.
031	Testing if the user can enter the time the vehicle passed site one.	Type the time the vehicle passed the first site in the third textbox.	The time will appear in the textbox and will not be deleted are being entered.
032	Testing if the user can enter the time the vehicle passed site two.	Type the time the vehicle passed the second site in the fourth textbox.	The time will appear in the textbox and will not be deleted are being entered.
033	Testing if the user can enter the distance between the sites.	Type the distance between the first and second site in the fifth textbox.	The distance between the sites will appear in the textbox and will not be deleted are being entered.
034	Testing if the user can enter the registration number.	Type the registration plate of the vehicle that is being assessed into the sixth textbox.	The registration plate of the vehicle will appear in the textbox and will not be deleted are being entered.
035	Testing if the reset function works.	Click the button which is labelled “reset”	The form will completely reset and all data inputted and outputted by the form will be reset.
036	Testing if the close button/ function works.	Click the button which is labelled “Close”	The form will be shut down and all data inputted by the user is not saved by the form.

---

**TASK THREE- TEST PLAN 2- CALCULATING SPEED**


---

<b>Test Reference</b>	<b>Reason for Test</b>	<b>Test Instructions</b>	<b>Expected Result</b>
037	Testing if the application can calculate the average speed of a vehicle and outputting the speed into a listbox.	Enter all necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two and submit the data.	The average speed of the vehicle will be outputted into a label which will tell the user the average speed of the vehicle in miles per hour.
038	Testing extremes- if the application can calculate the vehicle to be only 1mph over the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data. Set the miles as "1" and make the time difference one minute make sure the speed limit is 1mph lower than the average speed so for this set the speed limit as 59 mph.	As the vehicle is breaking the limit the form will subtract the speed limit from the average speed and output the speed over limit in the format "The vehicle is 1mph over the limit" onto a listbox.
039	Testing extremes- if the application can calculate the vehicles speed to be 1mph under the limit and recognise it is not breaking the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data. Set the miles as "1" and make the time difference one minute make sure the speed limit is 1mph lower than the average speed so for this set the speed limit as 61 mph.	As the vehicle is not breaking the speed limit the form will alert the user that the vehicles is not over the speed limit.

---

**TASK THREE-TEST PLAN 3- OUTPUTTING DATA**


---

Test Reference	Reason for Test	Test Instructions	Expected Result
040	Testing to see if the form can recognise that the speed of the vehicle is 1mph under the limit and does not output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit, registration plate and submit the data.	As the average speed is not greater than the speed limit (average speed < speed limit) the form will alert the user with a message box that the vehicle is not breaking the limit and the registration plate will not be outputted to the listbox.
041	Testing to see if the form can recognise that the speed of the vehicle is 1mph over the limit and does output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, registration plate, speed limit and submit the data.	As the average speed is greater than the speed limit (average speed > speed limit) the registration plate entered by the user will be outputted into a listbox which is labelled "vehicles breaking the speed limit".
042	Testing if the form can recognise that the plate "AA00AAA" is a standard plate and output "standard" in a listbox	Enter the registration plate as "AA00AAA"	The listbox labelled "Plate recognition" recognises the plate is standard and outputs standard.
043	Testing if the form can recognise that the plate "A000AAA" is a standard plate and output "standard" in a listbox	Enter the registration plate as "A000AAA"	The listbox labelled "Plate recognition" recognises the plate is standard and outputs standard.
044	Testing if the form can recognise that the plate "TMAG" is a non-standard plate and output "non-standard" in a listbox	Enter the registration plate as "TMAG"	The listbox labelled "Plate recognition" recognises the plate is non-standard and outputs non-standard into the listbox.
045	Testing if the form only enters whether the plate is standard or non-standard when the car is breaking the limit.	Enter the registration plate and make the speed limit greater than the speed of the vehicle.	The form will not output whether the plate or non-standard as the vehicle is not breaking the limit.

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**TASK THREE-TEST PLAN 4-CSV TESTING**


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<b>Test Reference</b>	<b>Reason for Test</b>	<b>Test Instructions</b>	<b>Expected Result</b>
046	Testing if the form can read from the CSV and output the driver's data.	After entering all of the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will appear with data about the driver.
047	Testing if the form can output the user's forename from a CSV.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's forename.
048	Testing if the form can output the user's surname from a CSV.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's surname.
049	Testing if the form can output the user's title from a CSV.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's title.
050	Testing if the form can output the user's address from a CSV.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's address.
051	Testing if the form can output all of the user's information from a CSV at once.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's information.
052	Testing if the form can send the driver's information, including forename, surname, title, address and any other relevant information.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	After closing the form, check the location where the CSV was meant to be sent and open the CSV where all the information will be stored.

053	Testing if the form can recognise the vehicle's plate format and send a standard plate to the CSV for only standard plates.	Enter all the data on the form, including a known number plate that is standard and press the button labelled "Driver's information".	After closing the form, check the location where the CSV was meant to be sent and open the CSV where all the information will be stored.
-----	---	---	--

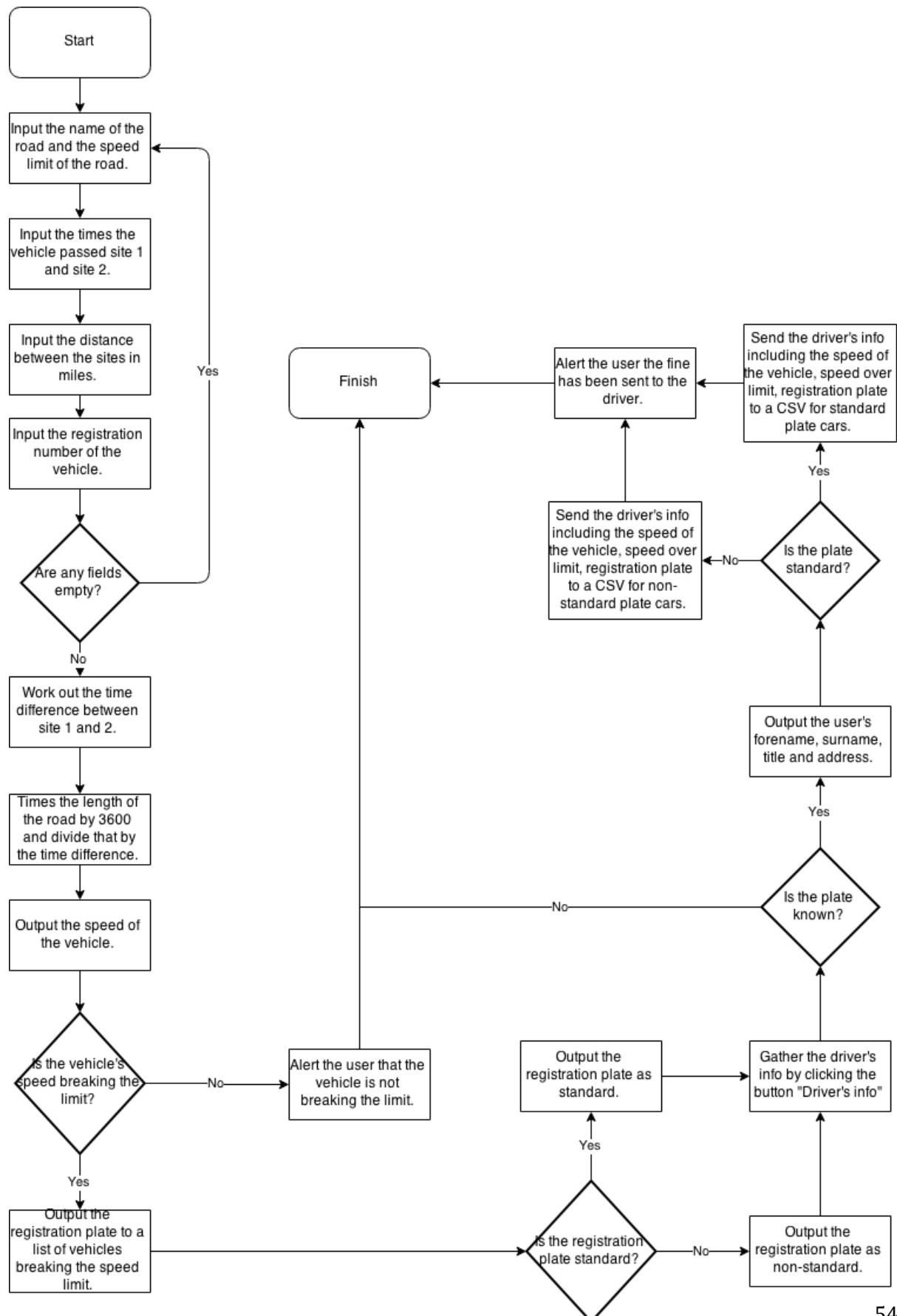
---

**TASK THREE-TEST PLAN 5-VALIDATION**


---

<b>Test Reference</b>	<b>Reason for Test</b>	<b>Test Instructions</b>	<b>Expected Result</b>
V19	To test if the validation for the road name textbox works.	Enter all fields apart from the road name.	A message box will alert the user that the road name must be entered to continue.
V20	To test if the validation for the speed limit textbox works.	Enter all fields apart from the speed limit.	A message box will alert the user that the speed limit must be entered to continue.
V21	To test if the validation for the time passed site one masked textbox works.	Enter all fields apart from the time passed site one field.	A message box will alert the user that the time passed site one must be entered to continue.
V22	To test if the validation for the time passed site two masked textbox works.	Enter all fields apart from the time passed site two field.	A message box will alert the user that the time passed site two must be entered to continue.
V23	To test if the validation for the distance between sites textbox works.	Enter all fields apart from the distance between sites.	A message box will alert the user that the distance between sites must be entered to continue.
V24	To test if the validation for the registration plate textbox works.	Enter all fields apart from the registration plate.	A message box will alert the user that the registration plate must be entered to continue.
V25	To test if the user cannot enter numeric digits for the road name.	For the road name field enter "1".	A message box will appear alerting the user the road name is invalid.
V26	To test if the user cannot enter characters for the speed limit.	For the speed limit field enter "one".	A message box will appear alerting the user the speed limit is invalid.
V27	To test if the user cannot enter characters for the distance between sites.	For the distance between sites field enter "one".	A message box will appear alerting the user the distance between sites is invalid.

## FLOWCHART



## PSEUDO CODE

---

Start

Declare the variables date1 and date2 as date

Declare the variable regnum as String

Declare variables timeDiff, averageSpeed and roadLength as double

Set timeDiff = Date2 – Date1 in seconds

averageSpeed = roadLength \*60 \*60/ timeDiff

Return averageSpeed

If averageSpeed > Speed Limit

Add regnum to Listbox

Else

Alert “This vehicle is not over the speed limit”

If average speed > speed limit then

If regnum fits mask of is “[A-Z] [A-Z] [0-9] [0-9] [A-Z] [A-Z] [A-Z]” or

“[A-Z] [A-Z] [0-9] [0-9] [A-Z] [A-Z] [A-Z] then

Listbox= the plate is standard.

Standard = true

Else

Listbox = the plate is not standard.

Standard = false

End if

Create function Functionread

Dim upper as expression [A-Z]

Dim number as expression [0-9]

If length does not equal 7 then

Return False

If upper matches 1, 2 as count < 2 return false

If number matches 3, 2 as count < 2 return false

If upper matches 5, 3 as count <3 return false

Return True



A543

End if

End function

If function Functionread = registartionplate then

Using MyReader read "s:\names.csv"

Set Delimiter as ","

Dim currentRowSelected as String

While not MyReader to EndofData

currentRowSelected = ReadFields

If currentRowSelected = registration plate Then

Show MessageBox "title & firstname & surname & "lives at" & address"

End if

If speedlimit < averagespeed Then

If standard = true then

sendtoStandardCSV( )

End if

Sub sendtoStandardCSV( )

Dim writeToCSV as StreamWriter

writeToCSV = "s:\driversinfostandard"

Write Line ("title & firstname & surname & "lives at" & "address" & averageSpeed & speedoverlimit")

End sub

End class

### INPUTS AND OUTPUTS FOR TASK THREE

Inputs	Outputs
Name of the road.	The average speed of the vehicle into a listbox.
Speed limit of the road.	The speed then vehicle was over the limit, if it was.
The time when the vehicle passed the initial site.	The registration of the vehicles that broke the speed limit into a listbox.
The time when the vehicle passed the final site.	The details of the driver e.g. forename, surname, title, address etc. to the user.
The distance between the two sites.	Whether the plate is standard or non-standard / custom into a listbox.
The registration plate of the vehicle.	The details of the driver e.g. forename, surname, title, address etc. including the average speed of the vehicle, whether it is standard or non-standard plate and the speed over limit to a CSV.

### TESTING-ENTERING DATA

#### REASON FOR TESTING

Through testing, I am able to ensure that the final code for task three is working and is able to be edited to become more efficient later on. By testing if the user can do basic functions like enter the data onto the form such as the name of the road, the speed limit, the vehicles registration plate etc, it enables me to show testing that the form is functional as the basic components of the form are functional. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
029	Testing if the user can enter the name of the road.	Type the name of the road in the first textbox.	The road name will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 29)	No corrections were made.
030	Testing if the user can enter the speed limit of the road.	Type the speed limit of the road in the second textbox.	The speed limit will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 30)	No corrections were made.
031	Testing if the user can enter the time the vehicle passed site one.	Type the time the vehicle passed the first site in the third textbox.	The time will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 31)	No corrections were made.
032	Testing if the	Type the time	The time will	The results	No corrections

	user can enter the time the vehicle passed site two.	the vehicle passed the second site in the fourth textbox.	appear in the textbox and will not be deleted are being entered.	were as expected. (Figure 32)	were made.
033	Testing if the user can enter the distance between the sites.	Type the distance between the first and second site in the fifth textbox.	The distance between the sites will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 33)	No corrections were made.
034	Testing if the user can enter the registration number.	Type the registration plate of the vehicle that is being assessed into the sixth textbox.	The registration plate of the vehicle will appear in the textbox and will not be deleted are being entered.	The results were as expected. (Figure 34)	No corrections were made.
035	Testing if the reset function works.	Click the button which is labelled "reset"	The form will completely reset and all data inputted and outputted by the form will be reset.	The results were as expected. (Figure 35)	No corrections were made.
036	Testing if the close button/ function works.	Click the button which is labelled "Close"	The form will be shut down and all data inputted by the user is not saved by the form.	The results were as expected. (Figure 36)	No corrections were made.

As all results were to as expected it shows my editing of the code for efficiency does not interfere with basic components from Task One and Task Two. As I created a Close Button I created a new test, Test 036 which will only be tested on Task Three as it was added during the progression of Task Three.

## TESTING-CALCULATING SPEED

### REASON FOR TESTING

Through testing I am able to show evidence that the calculations needed for task three still continues to work efficiently and effectively. By testing the extremes such as 1mph over the limit and 1mph under the limit, it enables me to give good evidence that the solution to task three fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
037	Testing if the application can calculate the average speed of a vehicle and outputting the speed into a listbox.	Enter all necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two and submit the data.	The average speed of the vehicle will be outputted into a listbox which will tell the user the average speed of the vehicle in miles per hour.	The results were as expected. (Figure 37)	No corrections were made.
038	Testing extremes- if the application can calculate the vehicle to be only 1mph over the limit.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data. Set the miles as "1" and make the time difference one minute make sure the speed limit is 1mph lower than the average speed so for this set the speed limit as 59 mph.	As the vehicle is breaking the limit the form will subtract the speed limit from the average speed and output the speed over limit in the format "The vehicle is 1mph over the limit" onto a listbox.	The results were as expected. (Figure 38)	No corrections were made.
039	Testing extremes- if the	Enter all the necessary	As the vehicle is not breaking	The results were as	No corrections were made.

	application can calculate the vehicles speed to be 1mph under the limit and recognise it is not breaking the limit.	aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit and submit the data. Set the miles as "1" and make the time difference one minute make sure the speed limit is 1mph lower than the average speed so for this set the speed limit as 61 mph.	the speed limit the form will alert the user that the vehicles is not over the speed limit.	expected. (Figure 39)	
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As all results were to as expected it shows my editing of the code for efficiency does not interfere with basic components from Task One and Task Two.

## TESTING-OUTPUTTING DATA

### REASON FOR TESTING

Through testing I am able to show evidence that the form is correctly outputting data to the correct outputs. This testing is needed for task two as it gives proof that the code is working efficiently. By testing it enables me to give good evidence that the solution to Task Three fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
040	Testing to see if the form can recognise that the speed of the vehicle is 1mph under the limit and does not output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, speed limit, registration plate and submit the data.	As the average speed is not greater than the speed limit (average speed < speed limit) the form will alert the user with a message box that the vehicle is not breaking the limit and the registration plate will not be outputted to the listbox.	The results were as expected. (Figure 40)	No corrections were made.
041	Testing to see if the form can recognise that the speed of the vehicle is 1mph over the limit and does output the registration plate into the listbox.	Enter all the necessary aspects of the calculation e.g. distance between sites, time vehicle passed site one, time vehicle passed site two, registration plate, speed limit and submit the data.	As the average speed is greater than the speed limit (average speed > speed limit) the registration plate entered by the user will be outputted into a listbox which is labelled "vehicles breaking the speed limit".	The results were as expected. (Figure 41)	No corrections were made.
042	Testing if the form can recognise that the plate "AA00AAA" is a standard plate and output "standard" in a listbox	Enter the registration plate as "AA00AAA"	The listbox labelled "Plate recognition" recognises the plate is standard and outputs standard.	The results were as expected. (Figure 42)	No corrections were made.

043	Testing if the form can recognise that the plate "A000AAA" is a standard plate and output "standard" in a listbox	Enter the registration plate as "A000AAA"	The listbox labelled "Plate recognition" recognises the plate is standard and outputs standard.	The results were as expected. (Figure 43)	No corrections were made.
044	Testing if the form can recognise that the plate "TMAG" is a non-standard plate and output "non-standard" in a listbox	Enter the registration plate as "TMAG"	The listbox labelled "Plate recognition" recognises the plate is non-standard and outputs non-standard into the listbox.	The results were as expected. (Figure 44)	No corrections were made.
045	Testing if the form only enters whether the plate is standard or non-standard when the car is breaking the limit.	Enter the registration plate and make the speed limit greater than the speed of the vehicle.	The form will not output whether the plate or non-standard as the vehicle is not breaking the limit.	The results were as expected. (Figure 45)	No corrections were made.

As all results were to as expected it shows my editing of the code for efficiency does not interfere with basic components from Task One and Task Two.

## TESTING-CSV TESTING

### REASON FOR TESTING

Through testing I am able to show evidence that the form is correctly reading and writing to a CSV effectively and outputting the correct outputs. This testing is needed for task three as it gives proof that the code is working efficiently and fits the specification for Task Three. By testing it enables me to give good evidence that the solution to task two fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem. As this is new for Task Three no testing in Task One or Two has been done for this part of the specification and criteria.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
046	Testing if the form can read from the CSV and output the driver's data.	After entering all of the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will appear with data about the driver.	The form did not output any data about the driver. (Figure 46)	After editing the function were if the registration plate matches the registration plate in the form I changed the mid numbers from the third If from "5, 2" to "5, 3" as in a registration plate the final three characters are letters and the first starts 5 characters into the plate. (Figure 46.1)
047	Testing if the form can output the user's forename from a CSV.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's forename.	The form incorrectly outputted the address of the driver. (Figure 47)	I edited the message box so it outputted the forename as it was set on the current row selected for the address. (Figure 47.1)



048	Testing if the form can output the user's surname from a CSV.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's surname.	The results were as expected.  (Figure 48)	No corrections were made.
049	Testing if the form can output the user's title from a CSV.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's title.	The results were as expected.  (Figure 49)	No corrections were made.
050	Testing if the form can output the user's address from a CSV.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's address.	The results were as expected.  (Figure 50)	No corrections were made.
051	Testing if the form can output all of the user's information from a CSV at once.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	A message box will show the user's information.	The results were as expected.  (Figure 51)	No corrections were made.
052	Testing if the form can send the driver's information, including forename, surname, title, address and any other relevant information.	Enter all the data on the form, including a known number plate and press the button labelled "Driver's information".	After closing the form, check the location where the CSV was meant to be sent and open the CSV where all the information will be stored.	The results were as expected.  (Figure 51)	No corrections were made.

053	Testing if the form can recognise the vehicle's plate format and send a standard plate to the CSV for only standard plates.	Enter all the data on the form, including a known number plate that is standard and press the button labelled "Driver's information".	After closing the form, check the location where the CSV was meant to be sent and open the CSV where all the information will be stored.	The results were as expected. (Figure 52)	No corrections were made.
054	Testing if the form can recognise the vehicle's plate format and send a non-standard plate to the CSV for only non-standard plates.	Enter all the data on the form, including a known number plate that is non-standard and press the button labelled "Driver's information".	After closing the form, check the location where the CSV was meant to be sent and open the CSV where all the information will be stored.	The results were as expected. (Figure 53)	No corrections were made.

As most of my results came out as expected it shows efficiency and that the code is effective. Even though two tests failed, Test 046 and 047, as they were amended now show a working solution that is efficient.

## TESTING- VALIDATION

### REASONS FOR TESTING

Through testing I am able to show evidence that the form is correctly validating empty fields or incorrectly inputted fields such as letters for the speed limit. This testing is needed for task two as it gives proof that the code is working efficiently. By testing it enables me to give good evidence that the solution to task one fits the specification and is working. Moreover, through testing it enables me to fix and find solutions to insufficient code so I am able to pinpoint an aspect of why the code is not working. Testing can also show how I found solutions to fix the broken code and what I have done to resolve the problem.

Test Reference	Reason for Test	Test Instructions	Expected Result	Actual Result	Amendments
V19	To test if the validation for the road name textbox works.	Enter all fields apart from the road name.	A message box will alert the user that the road name must be entered to continue.	The results were as expected. (Figure V19)	No corrections were needed.
V20	To test if the validation for the speed limit textbox works.	Enter all fields apart from the speed limit.	A message box will alert the user that the speed limit must be entered to continue.	The results were as expected. (Figure V20)	No corrections were needed.
V21	To test if the validation for the time passed site one masked textbox works.	Enter all fields apart from the time passed site one field.	A message box will alert the user that the time passed site one must be entered to continue.	The results were as expected. (Figure V21)	No corrections were needed.
V22	To test if the validation for the time passed site two masked textbox works.	Enter all fields apart from the time passed site two field.	A message box will alert the user that the time passed site two must be entered to continue.	The results were as expected. (Figure V22)	No corrections were needed.
V23	To test if the validation for the distance between sites textbox works.	Enter all fields apart from the distance between sites.	A message box will alert the user that the distance between sites must be entered to continue.	The results were as expected. (Figure V23)	No corrections were needed.

V24	To test if the validation for the registration plate textbox works.	Enter all fields apart from the registration plate.	A message box will alert the user that the registration plate must be entered to continue.	The results were as expected. (Figure V24)	No corrections were needed.
V25	To test if the user cannot enter numeric digits for the road name.	For the road name field enter "1".	A message box will appear alerting the user the road name is invalid.	The results were as expected. (Figure V25)	No corrections were needed.
V26	To test if the user cannot enter characters for the speed limit.	For the speed limit field enter "one".	A message box will appear alerting the user the speed limit is invalid.	The results were as expected. (Figure V26)	No corrections were needed.
V27	To test if the user cannot enter characters for the distance between sites.	For the distance between sites field enter "one".	A message box will appear alerting the user the distance between sites is invalid.	The results were as expected. (Figure V27)	No corrections were needed.

As all results were to as expected it shows my editing of the code for efficiency does not interfere with basic components from Task One and Task Two and can still validate the form.

### EVALUATION FOR TASK THREE

---

I have modified my initial code to ensure that the final code that is produced is an efficient solution to the tasks specification. There is evidence of its efficiency through out as, I clearly declared variable in an efficient manner. Overall the use of If statements allows me to tell the form to run a certain function if the user has entered something that can have two separate outcomes. So if the car is breaking the limit, it must send the registration plate to the listbox however if it is not breaking the speed limit run the else function set by the user. Furthermore, for test 046, I had to amend my code as it did not function correctly and efficiently. By using my knowledge of CSV's and help from MSDN, it allowed me to make the form able to read from a CSV and gather data about the driver. By clearly for filling all criteria in the success criteria (page 31); it has enabled me to effectively convey a working solution to the task. Test 046 refers to the last point on the success criteria. By testing, it helps me prove that the final solution is working and through screen-grabs it gives evidence that the final solution works in full efficiency. By amending my code for test 047 as the solution were not working, I able to show that now I have amended it and shown through screen shots (Figure 47.1) the final working solution is up to date and fits the specification and success criteria for Task Three. I know the code works through testing all basic and advanced components from all tasks so I can show the code is continually working efficiently. By creating the function it enables me to efficiently call on the sub routine for the form to be able to read from a CSV. As the layout of the form is sensible with sensible name on button and labels for textbox's the end user will easily be able to understand the layout of the form and enter data in properly. Furthermore through validating the user's inputs it stops the form for crashing if the user forgets to enter valuable data such as the speed limit for the average speed calculation. By stopping the form from crashing due to incorrect data, the code is effectively working at an efficient rate. Furthermore through validating the user's inputs it stops the form for crashing if the user forgets to enter relevant data such as the speed limit for the average speed calculation. By stopping the form from crashing due to incorrect data, the code is effectively working at an efficient rate.

### CONCLUSION FOR TASK THREE

In conclusion I have successfully met the success criteria for Task One and Task Two and all aspects of Task Three as well as my code functions effectively and efficiently. As the success criteria covers eight objectives the form should be able to do and as the form can surpass the requirements additional functions can be added to create efficiency within the code. The evidence shown through screenshots clearly conveys a working solution to the task and annotations of the code clearly explains the function of each line and how it is useful with the code. I can now state that my code is fully effective as it meets the task's requirements and is vividly portrayed in the testing tables. Overall, my code is efficient as well as being user friendly due to clear layout and instructions for the user set by me.

### FINAL LAYOUT FOR TASK THREE

The screenshot shows a Windows application window titled "Cars that break the limit". The interface includes several input fields and buttons. Callouts provide detailed explanations for each component:

- Input Fields:**
  - "Please enter the road name" (Text box)
  - "Please enter the speed limit (mph)" (Text box)
  - "Time when vehicle passes site 1" (Time picker)
  - "Time when vehicle passes site 2" (Time picker)
  - "Distance between site 1 and site 2 (miles)" (Text box)
  - "Please enter the registration plate (no gaps)" (Text box)
- List Boxes:**
  - "Vehicles exceeding the limit" (ListBox1)
  - "Average Speed (mph)" (ListBox2)
  - "Speed over limit (mph)" (ListBox3)
  - "Is the plate standard?" (ListBox4)
- Buttons:**
  - "Submit data": This button will find the driver's information from a CSV.
  - "Find drivers info": This button will calculate the speed of the vehicle and output relevant data to listboxes.
  - "Close": This button will close the form.
  - "Reset": This button will reset the form.

Additional callouts describe the output of the application:

- "The vehicles registration plate will be outputted to here if the vehicle is breaking the limit." (Points to ListBox1)
- "The speed of the vehicle will be outputted here." (Points to ListBox2)
- "The speed over the limit will be outputted here." (Points to ListBox3)
- "The plate's format will be outputted here so if the plate is standard the list box will say it is standard." (Points to ListBox4)

## FINAL CODE ANNOTATED FOR TASK THREE

```

Public Class Form1
    'This declares all variables publicly so all subs can see these variables.
    Dim Date1, Date2 As Date
    Dim timediff, averageSpeed As Double
    Dim roadName, firstName, surname, homeAddress, standardCheck, regnum, title As String
    Dim roadLength, speedLimit As Integer

    Sub Dimming()
        'This declares all variables in one sub and can be enabled in all subs. This is used
        'for efficiency
        roadName = Me.TextBox3.Text
        speedLimit = Me.TextBox1.Text
        regnum = Me.TextBox2.Text
        Date1 = Me.MaskedTextBox1.Text
        Date2 = Me.MaskedTextBox2.Text
        roadLength = Me.TextBox4.Text
    End Sub

    Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click
        'This allows all dims from the sub dimming to be present in this sub
        Dimming()
        'This uses the function to collect data of the driver from a CSV
        If functionread(Me.TextBox2.Text) Then
            'This tells the form the destination the data will be collected from
            Using MyReader As New
                Microsoft.VisualBasic.FileIO.TextFieldParser("s:\names.csv")
            MyReader.TextFieldType = FileIO.FieldType.Delimited
            'This sets the delimiter in the CSV as a comma
            MyReader.SetDelimiters(",")
            Dim currentRowSelected As String()
            While Not MyReader.EndOfData
                currentRowSelected = MyReader.ReadFields()
                'This tells the form if the registration plate on the form matches a registration
                'plate in the CSV all the details with the plate will be outputted.
                If currentRowSelected(0) = regnum Then
                    'This creates the message the user will see about the driver's information
                    MsgBox(currentRowSelected(4) & " " & currentRowSelected(2) & " " &
                        currentRowSelected(3) & " " & "lives at" & " " & currentRowSelected(1))
                    homeAddress = currentRowSelected(1)
                    firstName = currentRowSelected(2)
                    surname = currentRowSelected(3)
                    title = currentRowSelected(4)
                    'This runs the sub routine that sends the data to a CSV.
                    If speedLimit < averageSpeed Then
                        storedetailsnonstandard()
                        MessageBox.Show(firstName & " " & surname & " " & "has been sent a
                            fine", "Fine Alert")
                    Else : MessageBox.Show("The driver cannot be sent a fine as he is not
                        breaking the limit", "Fine Alert")
                    End If
                End While
            End Using
        End If
        'If the plate is non-standard it will try to find it without using the mask set in the
        'function
        Else : Using MyReader As New
            Microsoft.VisualBasic.FileIO.TextFieldParser("c:\test\names.csv")
            MyReader.TextFieldType = FileIO.FieldType.Delimited
            MyReader.SetDelimiters(",")
            Dim currentRowSelected As String()
            While Not MyReader.EndOfData

```

```

        currentRowSelected = MyReader.ReadFields()
        If currentRowSelected(0) = regnum Then
            MessageBox.Show(currentRowSelected(4) & " " &
currentRowSelected(2) & " " & currentRowSelected(3) & " " & "lives at" & " " &
currentRowSelected(1), "Drivers Info")
            homeAddress = currentRowSelected(1)
            firstName = currentRowSelected(2)
            surname = currentRowSelected(3)
            title = currentRowSelected(4)
        End If
    End If
End While

End Using
If speedLimit < averageSpeed Then
    storedetailsnonstandard()
    MessageBox.Show(firstName & " " & surname & " " & "has been sent a
fine", "Fine Alert")
Else : MessageBox.Show("The driver cannot be sent a fine as he is not
breaking the limit", "Fine Alert")
End If
End Sub

' This is a sub routine that sends the data on the form and the info from the CSV to a
CSV if the plate is standard
Sub storedetailsstandard()
    Dim writeToCSV As System.IO.StreamWriter
    writeToCSV =
My.Computer.FileSystem.OpenTextFileWriter("s:\driverinfostandard.csv", True)
    writeToCSV.WriteLine(Me.TextBox3.Text & "," & homeAddress & "," & firstName &
"," & surname & "," & averageSpeed & "mph" & "," & averageSpeed - speedLimit & "mph
over the limit")
End Sub

' This is a sub routine that sends the data on the form and the info from the CSV to a
CSV if the plate is non-standard
Sub storedetailsnonstandard()
    Dim writeToCSV As System.IO.StreamWriter
    writeToCSV =
My.Computer.FileSystem.OpenTextFileWriter("s:\driverinfoonstandard.csv", True)
    writeToCSV.WriteLine(Me.TextBox3.Text & "," & homeAddress & "," & firstName &
"," & surname & "," & averageSpeed & "mph" & "," & averageSpeed - speedLimit & "mph
over the limit")
End Sub

Function functionread(ByVal regnum As String) As Boolean
' This creates the function that is used to find the registration plate in the CSV with
the driver's information. This checks that each part of the registration plate, the
letters and numbers match.
    Dimming()
    Dim upper As New System.Text.RegularExpressions.Regex("[A-Z]")
    Dim number As New System.Text.RegularExpressions.Regex("[0-9]")
' This states if the registration plates length does not equal 7 then do not continue
    If Len(regnum) <> 7 Then Return False
' This checks if the registration on the form matches a registration plate on the CSV.
    If upper.Matches(Mid(regnum, 1, 2)).Count < 2 Then Return False
    If number.Matches(Mid(regnum, 3, 2)).Count < 2 Then Return False
    If upper.Matches(Mid(regnum, 5, 3)).Count < 3 Then Return False
    Return True
End Function

```



```

Private Sub Button3_Click(sender As Object, e As EventArgs) Handles Button3.Click
    Dimming()
    'This if statement validates if any fields are empty and breaks the code if there is
    an empty field
    If Me.TextBox3.Text.Length = 0 Then
        'This creates the alert to alert the user that a field is empty
        MsgBox("Please enter the name of the road", vbInformation, "Validation Alert")
        'By leaving the sub it will stop further code, so it will not break later on
    Exit Sub
    ElseIf Me.TextBox1.Text.Length = 0 Then

        MsgBox("Please enter the speed limit", vbInformation, "Validation Alert")
        Exit Sub
    ElseIf Me.TextBox4.Text.Length = 0 Then
        MsgBox("Please enter the distance between sites", vbInformation,
"Validation Alert")
        Exit Sub
    ElseIf Me.TextBox2.Text.Length = 0 Then
        MsgBox("Please enter the registration plate", vbInformation, "Validation
Alert")
        Exit Sub
    ElseIf Not MaskedTextBox1.MaskCompleted Then
        MsgBox("Please enter the time the vehicle passed site one", vbInformation,
"Validation Alert")
        Exit Sub
    ElseIf Not MaskedTextBox2.MaskCompleted Then
        MsgBox("Please enter the time the vehicle passed site two", vbInformation,
"Validation Alert")
        Exit Sub
    End If

    'This if statement validates that the correct values are entered into the
    textbox's e.g numerical values for speed limit
    If Not IsNumeric(Me.TextBox1.Text) Then
        MsgBox("Invalid data entered, Please enter numbers only for the speed
limit.", vbInformation, "Alert")
        Exit Sub
    ElseIf IsNumeric(Me.TextBox3.Text) Then
        MsgBox("Invalid data entered, Please enter letters only for the road
name.", vbInformation, "Alert")
        Exit Sub
    ElseIf Not IsNumeric(Me.TextBox4.Text) Then
        MsgBox("Invalid data entered, Please enter numbers only for the distance
between sites.", vbInformation, "Alert")
        Exit Sub
    End If

    'this toggles the driver's info button to be enabled
    Button1.Enabled = True
    'This creates the time difference between date1 and date2
    timediff = DateDiff("s", Date1, Date2)
    'This calculates the average speed of the vehicle I used one calculation for
    efficiency.
    averageSpeed = roadLength * 3600 / timediff
    'This will output the speed of the vehicle efficiently
    MessageBox.Show("The speed of the vehicle is " & averageSpeed & "mph", "The
speed of the vehicle")
    'This shows the user the mph the vehicle was over the limit

```

```

    If averageSpeed > speedLimit Then
        MessageBox.Show("The vehicle is " & averageSpeed - speedLimit & "mph over
the limit!", "Breaking Speed Alert")
    Else
        MessageBox.Show("The vehicle is not breaking the speed limit", "Alert")
    End If
    'This sends data to the listboxes so the user can look at all necessary data
    If speedLimit < averageSpeed Then
        Me.ListBox1.Items.Add(regnum)
        Me.ListBox2.Items.Add(averageSpeed)
        Me.ListBox3.Items.Add(averageSpeed - speedLimit & "mph over the limit")
    End If

    'This checks whether the registration number fits the standard mask from 2001- and the
    original mask used from 1983 - 2001

    If speedLimit < averageSpeed Then
        If UCase$(regnum) Like "[A-Z][A-Z][0-9][0-9][A-Z][A-Z][A-Z]" Or
UCase$(regnum) Like "[A-Z][0-9][0-9][0-9][A-Z][A-Z][A-Z]" Then
            Me.ListBox4.Items.Add("Standard Plate")
            standardCheck = "standard"
        Else
            Me.ListBox4.Items.Add("Non-Standard Plate")
            standardCheck = "nonstandard"
        End If
    End If
End Sub

Private Sub TextBox2_TextChanged(sender As Object, e As EventArgs) Handles
TextBox2.TextChanged
    'This makes the registration number textbox all uppercase letters
    Me.TextBox2.CharacterCasing = CharacterCasing.Upper
End Sub

Private Sub Button2_Click(sender As Object, e As EventArgs) Handles Button2.Click
    'This creates the reset button that will reset every textbox and listbox.
    Controls.Clear()
    InitializeComponent()
End Sub

Private Sub Button5_Click(sender As Object, e As EventArgs) Handles Button5.Click
    'This creates the close button
    Close()
End Sub

End Class

```

## FINAL CONCLUSION

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Task one, Task two and Task three are all related as they all ask for the user to be able to work out whether the vehicle is breaking the limit of not and being able to output data about the driver, however as the tasks go on the task ask for the form to output more and in depth information about the driver information. Through using sub routines I can vividly convey efficiency in my code. Moreover through using declarative statements such as “roadName” and “speedLimit” it provides efficiency to the code. Overall through the use of If statements, these allow me to tell the form to run a certain function if the user has entered something that can have two separate outcomes such as test 045 when the plate’s format should only be outputted if the vehicle is breaking the limit. Moreover for Task Two, through the use of Ucase, it effectively calculates the format of the vehicle’s registration plate and outputs the answer to a listbox. In addition, through testing I am effectively able to illustrate that the code works and fits the criteria. By testing and giving evidence of the tests, this enables me to show a final working solution that is effective and efficient through any amendments. For example Test 052 fits the final point of the task three success criteria (page 41) and figure 52 (page 86) portrays the working solution of the result. Furthermore through testing I am able to test if the final working solution fits the criteria which is based on the specification for the task. The purpose of the success criteria for each task is to convey what the form should be able to for fill the specification asked in the task. So Test 042 and 043 in Task Two are only in the testing as the specification asks for the form to be able to recognise the difference between a standard and non-standard plate. However tests such as 009 and 010 are not mentioned in the task specification and success criteria for task one, however they were implemented into the testing as the user can be more clear on how far over or under the limit the vehicle was giving a more detailed calculation and result to the calculation on the speed of the vehicle compared to the legal speed limit. Also this is the same for Test 042 in Task Three as the specification asks for the form to be able to output the forename, surname and address of the driver, but by adding more information about the driver such as their title the user is given a more detailed and accurate amount of information about the driver. Overall I believe my form is set and is user friendly by giving informative and helpful alerts to data that was entered incorrectly such as numerical digits for the name of the road (Test V7).

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## SCREEN-GRABS

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### TASK ONE

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The screenshot shows a window titled "Cars breaking the limit". It contains the following elements:

- Input field for "Please enter the road name" with the text "Rambler Lane".
- Input field for "Please enter the speed limit (mph)".
- Input field for "Enter the time vehicle passed site 1" with a date/time picker showing "06/04/2015 10:45:30".
- Input field for "Enter the time vehicle passed site 2" with a date/time picker showing "06/04/2015 10:46:30".
- Input field for "Please enter the distance between sites (miles)".
- Input field for "Please enter the registration plate (no gaps)".
- Two output labels: "Average speed of vehicle (mph)" and "Speed over limit (mph)".
- A label "List of vehicles breaking the limit" above an empty list box.
- Buttons for "Submit Data" and "Reset".

FIGURE 1

This screenshot is identical to Figure 1, but the "Please enter the speed limit (mph)" field now contains the value "30".

FIGURE 2

This screenshot is identical to Figure 2, but the "Enter the time vehicle passed site 1" field now contains the value "06/04/2015 10:45:30".

FIGURE 3

This screenshot is identical to Figure 3, but the "Enter the time vehicle passed site 2" field now contains the value "06/04/2015 10:46:30".

FIGURE 4

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

Average speed of vehicle (mph)      Speed over limit (mph)

List of vehicles breaking the limit

FIGURE 5

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

Average speed of vehicle (mph)      Speed over limit (mph)

List of vehicles breaking the limit

FIGURE 6

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

Average speed of vehicle (mph)      Speed over limit (mph)

List of vehicles breaking the limit

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

Average speed of vehicle (mph)      Speed over limit (mph)

List of vehicles breaking the limit

FIGURE 7

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

60mph

1mph over the limit

List of vehicles breaking the limit

AA00AAA

Submit Data

Reset

FIGURE 8

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

60mph

1mph over the limit

List of vehicles breaking the limit

AA00AAA

Submit Data

Reset

FIGURE 9

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 61

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

60mph

1mph under the limit

List of vehicles breaking the limit

AA00AAA

Submit Data

Reset

FIGURE 10

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 61

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

60mph

1mph under the limit

List of vehicles breaking the limit

AA00AAA

Submit Data

Reset

FIGURE 11

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

60mph 1mph over the limit

List of vehicles breaking the limit

FIGURE 12

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

60mph 1mph over the limit

List of vehicles breaking the limit

FIGURE 12.1

Validation Alert

Please enter the name of the road

FIGURE V1

Validation Alert

Please enter the speed limit

FIGURE V2

Validation Alert

Please enter the time the vehicle passed site one

FIGURE V3

Validation Alert

Please enter the time the vehicle passed site two

FIGURE V4

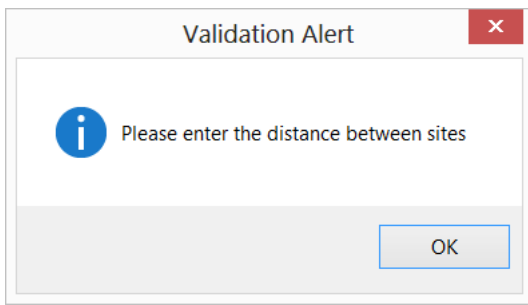


FIGURE V5

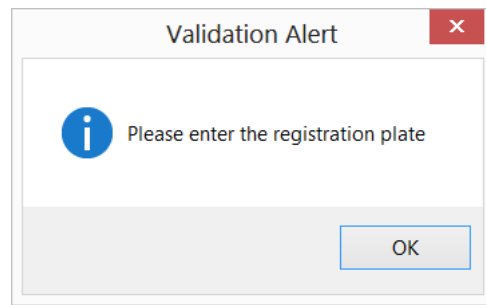


FIGURE V6

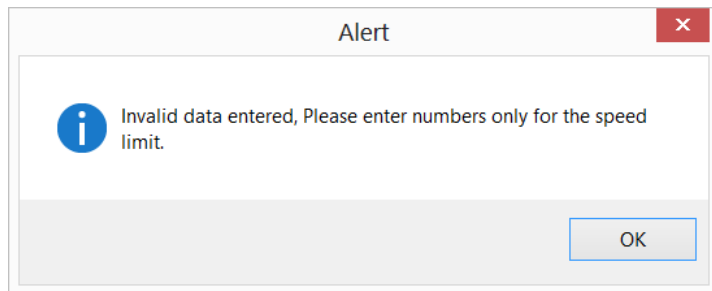


FIGURE V7

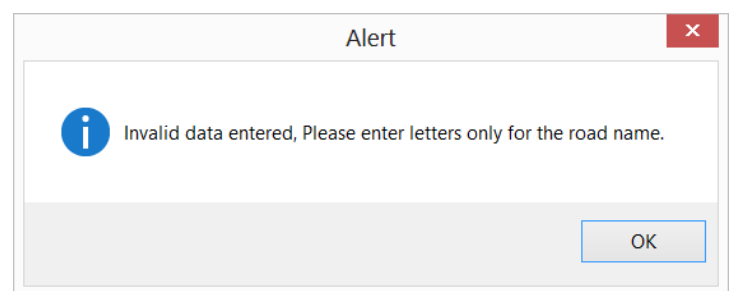


FIGURE V8

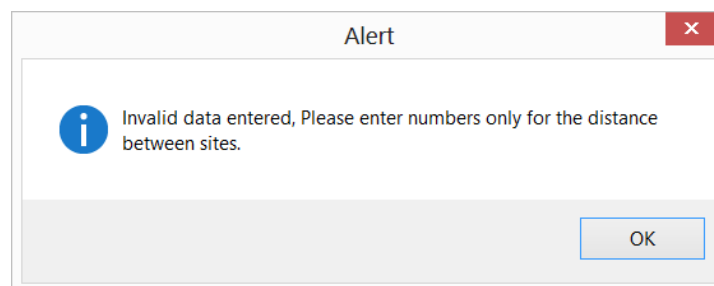
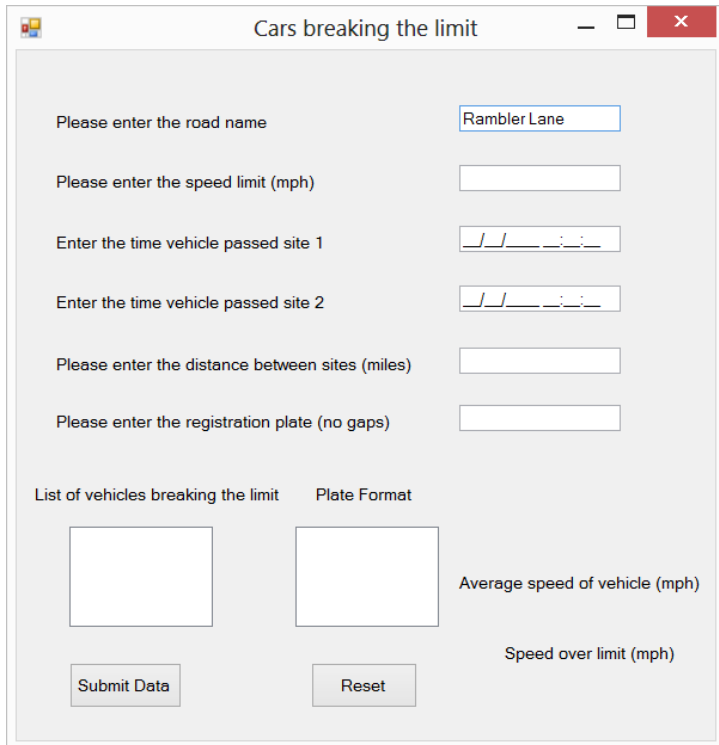


FIGURE V9



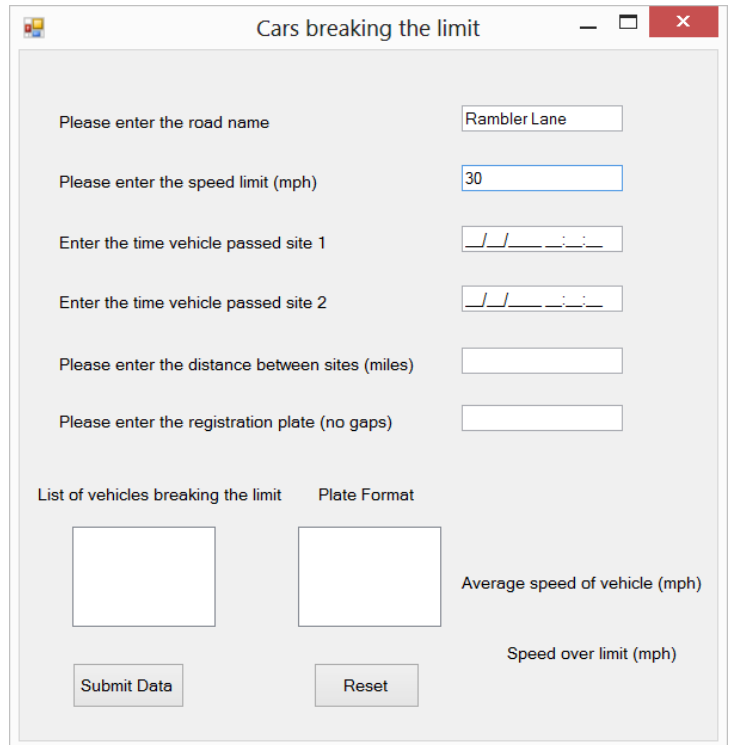
## TASK TWO



The application window titled "Cars breaking the limit" contains the following elements:

- Input field for "Please enter the road name" with the value "Rambler Lane".
- Input field for "Please enter the speed limit (mph)".
- Input field for "Enter the time vehicle passed site 1" with a date-time picker showing "06/04/2015 10:45:30".
- Input field for "Enter the time vehicle passed site 2" with a date-time picker showing "06/04/2015 10:45:30".
- Input field for "Please enter the distance between sites (miles)".
- Input field for "Please enter the registration plate (no gaps)".
- Two empty rectangular boxes labeled "List of vehicles breaking the limit" and "Plate Format".
- Text labels "Average speed of vehicle (mph)" and "Speed over limit (mph)".
- Buttons labeled "Submit Data" and "Reset".

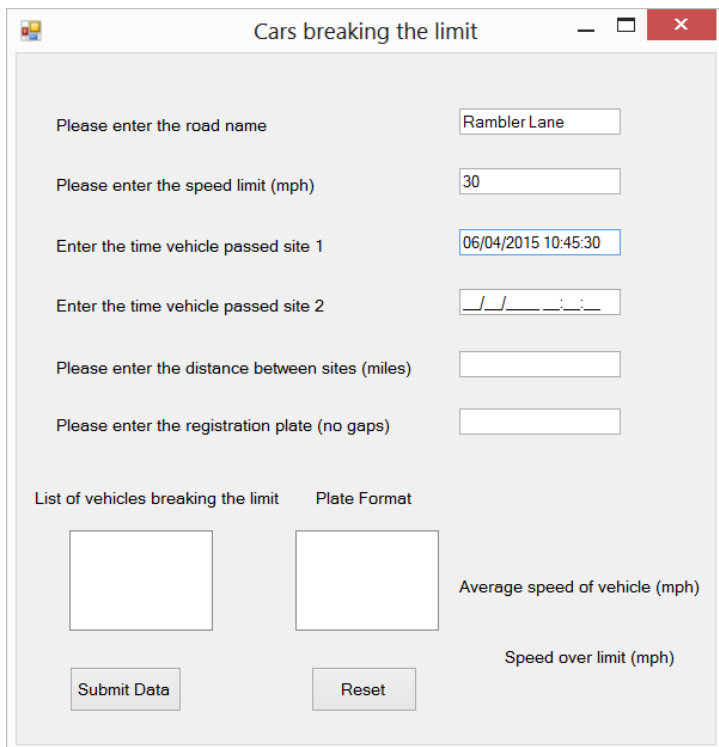
FIGURE 13



The application window titled "Cars breaking the limit" contains the following elements:

- Input field for "Please enter the road name" with the value "Rambler Lane".
- Input field for "Please enter the speed limit (mph)" with the value "30".
- Input field for "Enter the time vehicle passed site 1" with a date-time picker showing "06/04/2015 10:45:30".
- Input field for "Enter the time vehicle passed site 2" with a date-time picker showing "06/04/2015 10:45:30".
- Input field for "Please enter the distance between sites (miles)".
- Input field for "Please enter the registration plate (no gaps)".
- Two empty rectangular boxes labeled "List of vehicles breaking the limit" and "Plate Format".
- Text labels "Average speed of vehicle (mph)" and "Speed over limit (mph)".
- Buttons labeled "Submit Data" and "Reset".

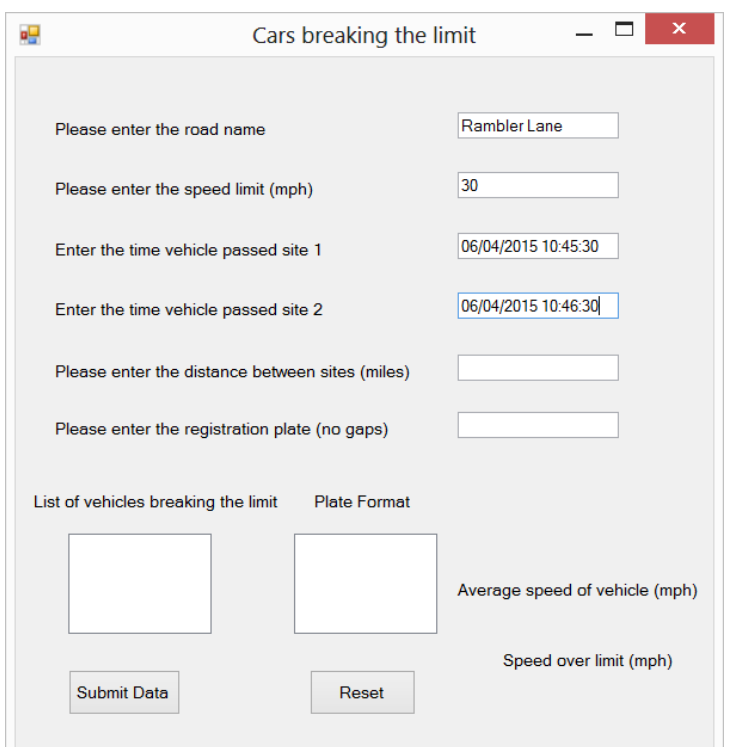
FIGURE 14



The application window titled "Cars breaking the limit" contains the following elements:

- Input field for "Please enter the road name" with the value "Rambler Lane".
- Input field for "Please enter the speed limit (mph)" with the value "30".
- Input field for "Enter the time vehicle passed site 1" with the value "06/04/2015 10:45:30".
- Input field for "Enter the time vehicle passed site 2" with a date-time picker showing "06/04/2015 10:45:30".
- Input field for "Please enter the distance between sites (miles)".
- Input field for "Please enter the registration plate (no gaps)".
- Two empty rectangular boxes labeled "List of vehicles breaking the limit" and "Plate Format".
- Text labels "Average speed of vehicle (mph)" and "Speed over limit (mph)".
- Buttons labeled "Submit Data" and "Reset".

FIGURE 15



The application window titled "Cars breaking the limit" contains the following elements:

- Input field for "Please enter the road name" with the value "Rambler Lane".
- Input field for "Please enter the speed limit (mph)" with the value "30".
- Input field for "Enter the time vehicle passed site 1" with the value "06/04/2015 10:45:30".
- Input field for "Enter the time vehicle passed site 2" with the value "06/04/2015 10:46:30".
- Input field for "Please enter the distance between sites (miles)".
- Input field for "Please enter the registration plate (no gaps)".
- Two empty rectangular boxes labeled "List of vehicles breaking the limit" and "Plate Format".
- Text labels "Average speed of vehicle (mph)" and "Speed over limit (mph)".
- Buttons labeled "Submit Data" and "Reset".

FIGURE 16

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

List of vehicles breaking the limit

Plate Format

Average speed of vehicle (mph)

Speed over limit (mph)

FIGURE 17

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

List of vehicles breaking the limit

Plate Format

Average speed of vehicle (mph)

Speed over limit (mph)

FIGURE 18

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

List of vehicles breaking the limit

Plate Format

Average speed of vehicle (mph)

Speed over limit (mph)

FIGURE 19

Cars breaking the limit

Please enter the road name

Please enter the speed limit (mph)

Enter the time vehicle passed site 1

Enter the time vehicle passed site 2

Please enter the distance between sites (miles)

Please enter the registration plate (no gaps)

List of vehicles breaking the limit

Plate Format

Average speed of vehicle (mph)

Speed over limit (mph)

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

List of vehicles breaking the limit: AA00AAA

Plate Format: Standard Plate

60mph

1mph over the limit

Submit Data Reset

FIGURE 20

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

List of vehicles breaking the limit: AA00AAA

Plate Format: Standard Plate

60mph

1mph over the limit

Submit Data Reset

FIGURE 21

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 61

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

List of vehicles breaking the limit:

Plate Format:

60mph

1mph under the limit

Submit Data Reset

FIGURE 22

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 61

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

List of vehicles breaking the limit:

Plate Format:

60mph

1mph under the limit

Submit Data Reset

FIGURE 23

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

List of vehicles breaking the limit: AA00AAA

Plate Format: Standard Plate

60mph

1mph over the limit

Submit Data Reset

FIGURE 24

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

List of vehicles breaking the limit: AA00AAA

Plate Format: Standard Plate

60mph

1mph over the limit

Submit Data Reset

FIGURE 25

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): A000AAA

List of vehicles breaking the limit: A000AAA

Plate Format: Standard Plate

60mph

1mph over the limit

Submit Data Reset

FIGURE 26

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): TMAG

List of vehicles breaking the limit: TMAG

Plate Format: Non-Standard Plate

60mph

1mph over the limit

Submit Data Reset

FIGURE 27

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 61

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

List of vehicles breaking the limit: Plate Format (Standard Plate)

Submit Data Reset

60mph

1mph under the limit

FIGURE 28

Cars breaking the limit

Please enter the road name: Rambler Lane

Please enter the speed limit (mph): 61

Enter the time vehicle passed site 1: 06/04/2015 10:45:30

Enter the time vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

List of vehicles breaking the limit: Plate Format (Standard Plate)

Submit Data Reset

60mph

1mph under the limit

FIGURE 28.1

Validation Alert

Please enter the name of the road

OK

FIGURE V10

Validation Alert

Please enter the speed limit

OK

FIGURE V11

Validation Alert

Please enter the time the vehicle passed site one

OK

FIGURE V12

Validation Alert

Please enter the time the vehicle passed site two

OK

FIGURE V13

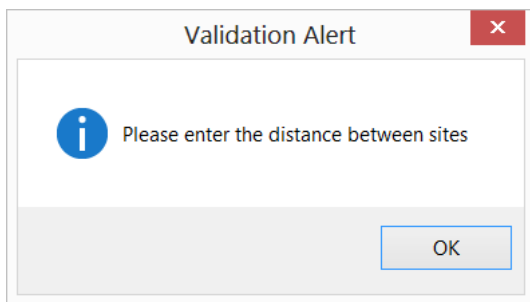


FIGURE V14

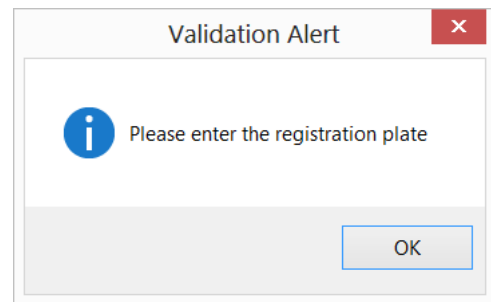


FIGURE V15

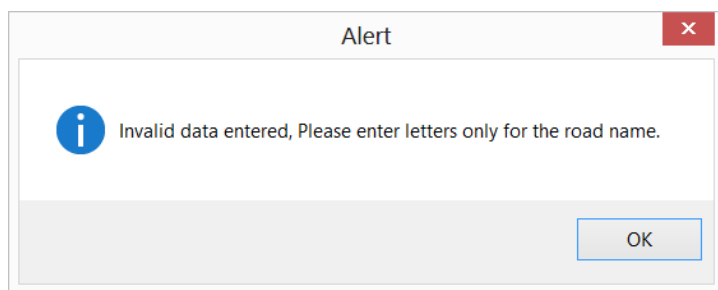


FIGURE V16

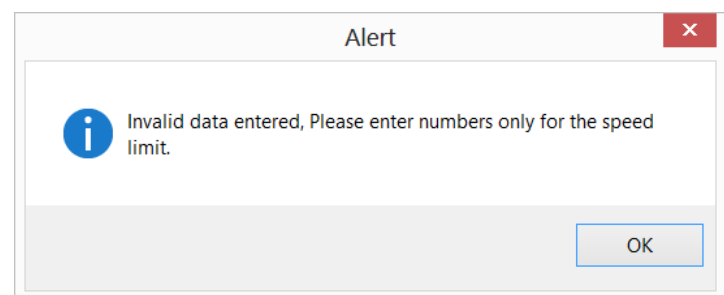


FIGURE V17

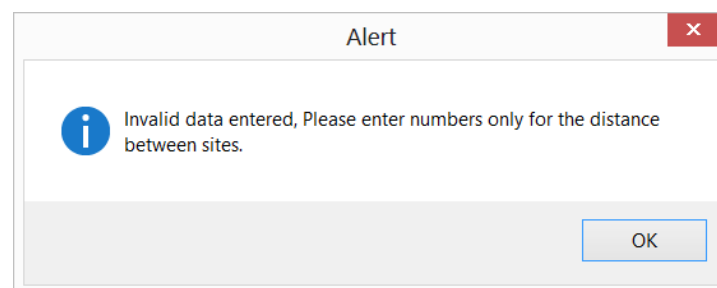


FIGURE V18

TASK THREE

Form1

Please enter the name of the road

Rambler Lane

Please enter the speed limit (mph)

Enter the time the vehicle passed site 1

\_\_/\_\_/\_\_ : \_\_: \_\_

Enter the time the vehicle passed site 2

\_\_/\_\_/\_\_ : \_\_: \_\_

Please enter the distance between the sites (miles)

Please enter the registration plate (no gaps)

Vehicles breaking the limit

Average speed (mph)

Speed over limit (mph)

Plate recognition

Submit Data

Find driver's info

Reset

Close

FIGURE 29

Form1

Please enter the name of the road

Rambler Lane

Please enter the speed limit (mph)

30

Enter the time the vehicle passed site 1

\_\_/\_\_/\_\_ : \_\_: \_\_

Enter the time the vehicle passed site 2

\_\_/\_\_/\_\_ : \_\_: \_\_

Please enter the distance between the sites (miles)

Please enter the registration plate (no gaps)

Vehicles breaking the limit

Average speed (mph)

Speed over limit (mph)

Plate recognition

Submit Data

Find driver's info

Reset

Close

FIGURE 30

Form1

Please enter the name of the road

Rambler Lane

Please enter the speed limit (mph)

30

Enter the time the vehicle passed site 1

06/04/2015 10:45:30

Enter the time the vehicle passed site 2

\_\_/\_\_/\_\_ : \_\_: \_\_

Please enter the distance between the sites (miles)

Please enter the registration plate (no gaps)

Vehicles breaking the limit

Average speed (mph)

Speed over limit (mph)

Plate recognition

Submit Data

Find driver's info

Reset

Close

FIGURE 31

Form1

Please enter the name of the road

Rambler Lane

Please enter the speed limit (mph)

30

Enter the time the vehicle passed site 1

06/04/2015 10:45:30

Enter the time the vehicle passed site 2

06/04/2015 10:46:30

Please enter the distance between the sites (miles)

Please enter the registration plate (no gaps)

Vehicles breaking the limit

Average speed (mph)

Speed over limit (mph)

Plate recognition

Submit Data

Find driver's info

Reset

Close

FIGURE 32

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps):

Vehicles breaking the limit: Average speed (mph): Speed over limit (mph): Plate recognition:

Submit Data Find driver's info Reset Close

FIGURE 33

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Vehicles breaking the limit: Average speed (mph): Speed over limit (mph): Plate recognition:

Submit Data Find driver's info Reset Close

FIGURE 34

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Vehicles breaking the limit: Average speed (mph): Speed over limit (mph): Plate recognition:

Submit Data Find driver's info Reset Close

FIGURE 35

Form1

Please enter the name of the road:

Please enter the speed limit (mph):

Enter the time the vehicle passed site 1: // // : : :

Enter the time the vehicle passed site 2: // // : : :

Please enter the distance between the sites (miles):

Please enter the registration plate (no gaps):

Vehicles breaking the limit: Average speed (mph): Speed over limit (mph): Plate recognition:

Submit Data Find driver's info Reset Close



Form1

Please enter the name of the road

Please enter the speed limit (mph)

Enter the time the vehicle passed site 1

Enter the time the vehicle passed site 2

Please enter the distance between the sites (miles)

Please enter the registration plate (no gaps)

Vehicles breaking the limit

Average speed (mph)

Speed over limit (mph)

Plate recognition

Submit Data Find driver's info Reset Close

```

2 references
Public Class Form1
    Dim Date1, Date2 As Date
    Dim timediff, averageSpeed As Double
    Dim roadName, firstName, surname, homeAddress, regnum, title As String
    Dim standardCheck As Boolean
    Dim roadLength, speedLimit As Integer

    5 references
    Sub Dimming()
        roadName = Me.TextBox3.Text
        speedLimit = Me.TextBox1.Text
        regnum = Me.TextBox2.Text
        Date1 = Me.MaskedTextBox1.Text
        Date2 = Me.MaskedTextBox2.Text
        roadLength = Me.TextBox4.Text
    End Sub

    0 references
    Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click
        Dimming()
        If functionread(Me.TextBox2.Text) Then
            Using MyReader As New Microsoft.VisualBasic.FileIO.TextFieldParser("c:\test\names.csv")
                MyReader.TextFieldType = FileIO.FieldType.Delimited
                MyReader.SetDelimiters(",")
                Dim currentRowSelected As Integer()
                While Not MyReader.EndOfData
                    currentRowSelected = MyReader.ReadFields()
                    If currentRowSelected(0) = regnum Then
                        MessageBox.Show(currentRowSelected(4) & " " & currentRowSelected(2) & " " &
                            homeAddress = currentRowSelected(1)
                            firstName = currentRowSelected(3)
                            surname = currentRowSelected(3)
                            title = currentRowSelected(4)
                            If speedLimit < averageSpeed Then
                                storedetailsstandard()
                                MessageBox.Show(firstName & " " & surname & " " & "has been sent a fine")
                            End If
                        End While
                    End Using
                End Using
            End Using
        End If
    End Sub

```

FIGURE 36

Form1

Please enter the name of the road

Please enter the speed limit (mph)

Enter the time the vehicle passed site 1

Enter the time the vehicle passed site 2

Please enter the distance between the sites (miles)

Please enter the registration plate (no gaps)

Vehicles breaking the limit

Average speed (mph)

Speed over limit (mph)

Plate recognition

Submit Data Find driver's info Reset Close

Form1

Please enter the name of the road

Please enter the speed limit (mph)

Enter the time the vehicle passed site 1

Enter the time the vehicle passed site 2

Please enter the distance between the sites (miles)

Please enter the registration plate (no gaps)

Vehicles breaking the limit

Average speed (mph)

Speed over limit (mph)

Plate recognition

Submit Data Find driver's info Reset Close

FIGURE 37

FIGURE 38

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 61

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

**Alert**

The vehicle is not breaking the speed limit

OK

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition

Submit Data Find driver's info Reset Close

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 61

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

**Alert**

The vehicle is not breaking the speed limit

OK

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition

Submit Data Find driver's info Reset Close

FIGURE 39

FIGURE 40

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition
AA00AAA	60	1mph over the limit	Standard Plate

Submit Data Find driver's info Reset Close

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition
AA00AAA	60	1mph over the limit	Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 41

FIGURE 42

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): A000AAA

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition
A000AAA	60	1mph over the limit	Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 43

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 59

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): TMAG

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition
TMAG	60	1mph over the limit	Non-Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 44

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 61

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition

Submit Data Find driver's info Reset Close

FIGURE 45

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time the vehicle passed site 1: 06/04/2015 10:45:30

Enter the time the vehicle passed site 2: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition
AA00AAA	60	30mph over the limit	Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 46

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time: 06/04/2015 10:45:30

Enter the time: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Drivers Info

Mr Tom Ato lives at 1 Rambler Lane

OK

Vehicles breaking the limit: AA00AAA

Average speed (mph): 60

Speed over limit (mph): 30mph over the limit

Plate recognition: Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 47.1

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time: 06/04/2015 10:45:30

Enter the time: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Drivers Info

1 Rambler Lane

OK

Vehicles breaking the limit: AA00AAA

Average speed (mph): 60

Speed over limit (mph): 30mph over the limit

Plate recognition: Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 48

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time: 06/04/2015 10:45:30

Enter the time: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Drivers Info

Tom

OK

Vehicles breaking the limit: AA00AAA

Average speed (mph): 60

Speed over limit (mph): 30mph over the limit

Plate recognition: Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 48.1

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time: 06/04/2015 10:45:30

Enter the time: 06/04/2015 10:46:30

Please enter the distance between the sites (miles): 1

Please enter the registration plate (no gaps): AA00AAA

Drivers Info

Ato

OK

Vehicles breaking the limit: AA00AAA

Average speed (mph): 60

Speed over limit (mph): 30mph over the limit

Plate recognition: Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 49

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time the vehicle was caught: 06/04/2015 10:45:30

Enter the time the vehicle was released: 06/04/2015 10:46:30

Please enter the distance (miles): 1

Please enter the registration plate: AA00AAA

**Drivers Info**

Mr

OK

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition
AA00AAA	60	30mph over the limit	Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 50

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time the vehicle was caught: 06/04/2015 10:45:30

Enter the time the vehicle was released: 06/04/2015 10:46:30

Please enter the distance (miles): 1

Please enter the registration plate: AA00AAA

**Drivers Info**

1 Rambler Lane

OK

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition
AA00AAA	60	30mph over the limit	Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 51

Form1

Please enter the name of the road: Rambler Lane

Please enter the speed limit (mph): 30

Enter the time the vehicle was caught: 06/04/2015 10:45:30

Enter the time the vehicle was released: 06/04/2015 10:46:30

Please enter the distance (miles): 1

Please enter the registration plate: AA00AAA

**Drivers Info**

Mr Tom Ato lives at 1 Rambler Lane

OK

Vehicles breaking the limit	Average speed (mph)	Speed over limit (mph)	Plate recognition
AA00AAA	60	30mph over the limit	Standard Plate

Submit Data Find driver's info Reset Close

FIGURE 52

1	AA00AAA	1 Rambler Lane	Tom	Ato	Mr
2	BB11BBB	2 Hempson Avenue	Etta	Burger	Mrs
3	ZZ00ZZZ	3 Work Street	Jean	Short	Miss
4	TMAG	4 Dollar Road	Thomas	Jake	Mr
5	A000AAA	5 Langley Road	Owen	Man	Sir
6					
7					
8					

	A	B	C	D	E	F
1	AA00AAA	1 Rambler Lane	Tom	Ato	60mph	30mph over the limit
2						
3						

FIGURE 53

	A	B	C	D	E	F
1	TMAG	4 Dollar Road	Thomas	Jake	60mph	30mph over the limit
2						
3						

FIGURE 54

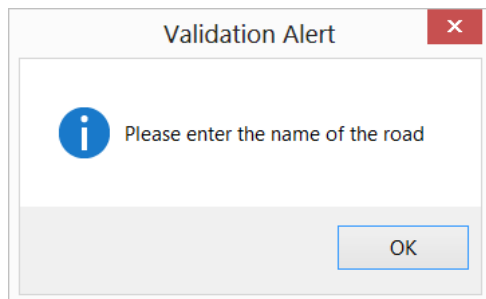


FIGURE V19

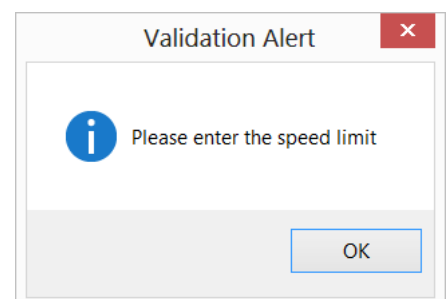


FIGURE V20

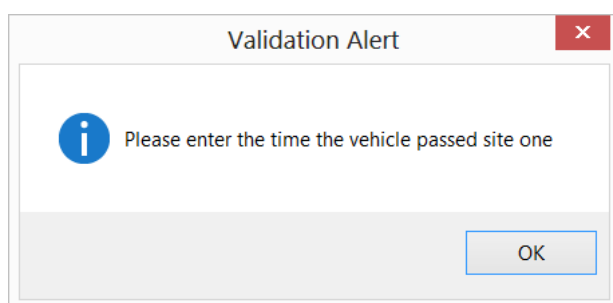


FIGURE V21

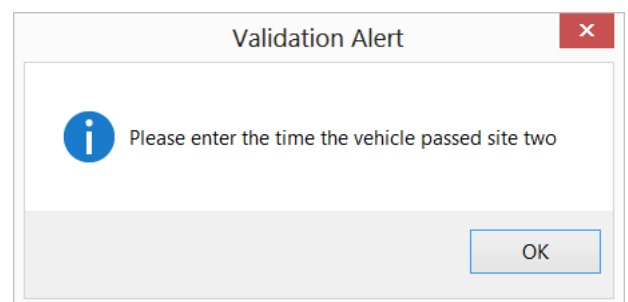


FIGURE V22

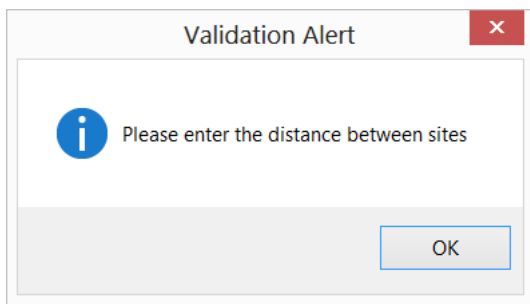


FIGURE V23

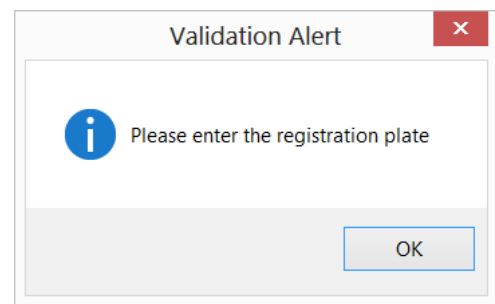


FIGURE V24

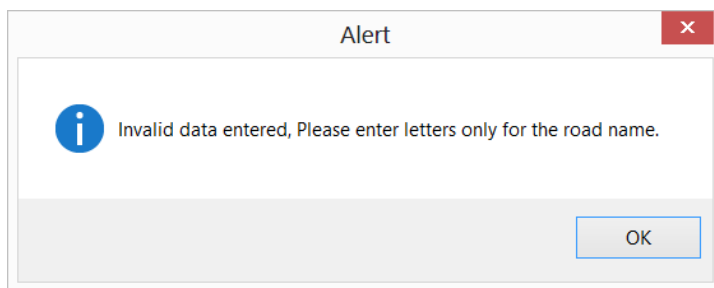


FIGURE V25

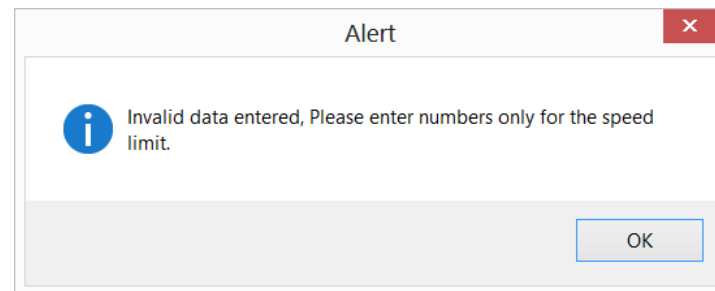


FIGURE V26

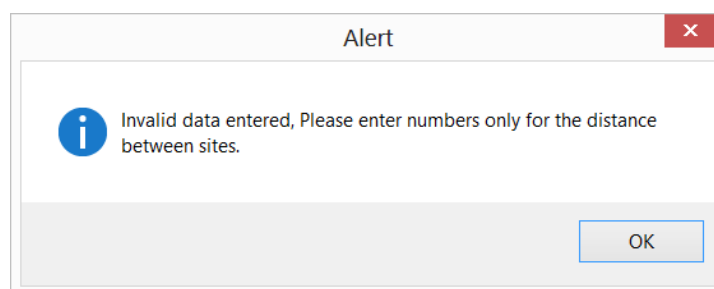


FIGURE V27