

## **Reporting Tasks**

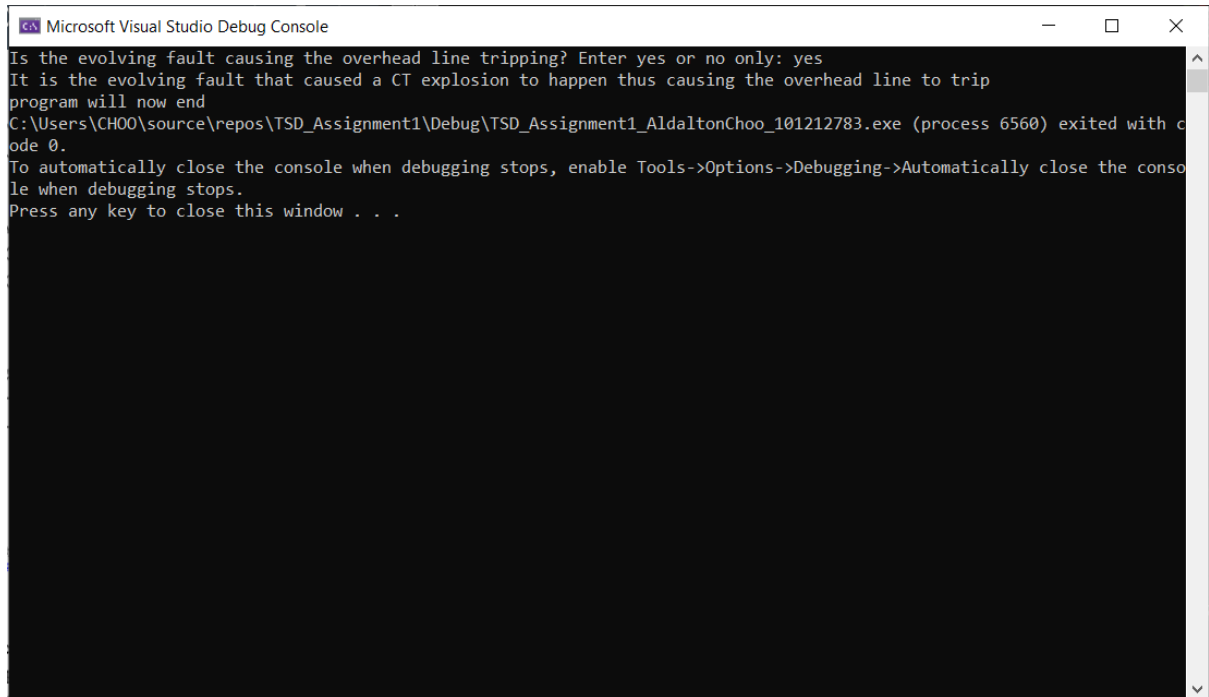
a)

Variable	Identifier	Type
Evolving Fault	e_fault	String
$\lambda$ , Gradient or rate of change of the curve	v_gradient	Double
Voltage Dip	v_voltageDip	Double
Permanent Fault	p_fault	String
$\Delta t$ , Time interval between the last neutral current distortions and a flashover (real number)	v_timeInterval	Double
Option to allow user to retry the program	retry	String

- b) This program obtains the users input progressively when they are needed in each node in the decision tree. This is because each decision node is affected by different inputs enter by the user. For example, the user is asked whether it was the Evolving fault causing the overhead line tripping, if the user entered yes then it will show an output saying a CT explosion is the reason why the overhead line tripped and if the user entered no it will move on to the next decision process to find out the cause of the overhead line tripping. This allows the user to obtain the cause of overhead line tripping much faster rather than having to wait until the end of the program which is a waste of time when one of the earlier user inputs are the reason why the overhead line tripped.

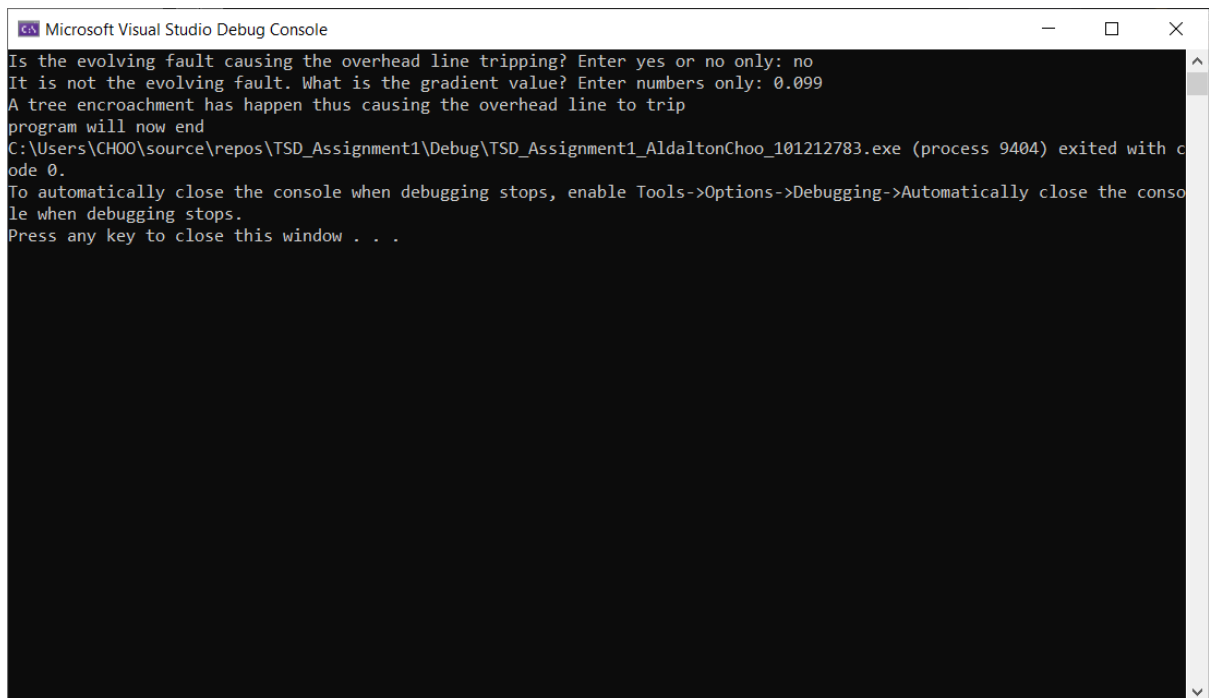
## Testing Tasks

a)



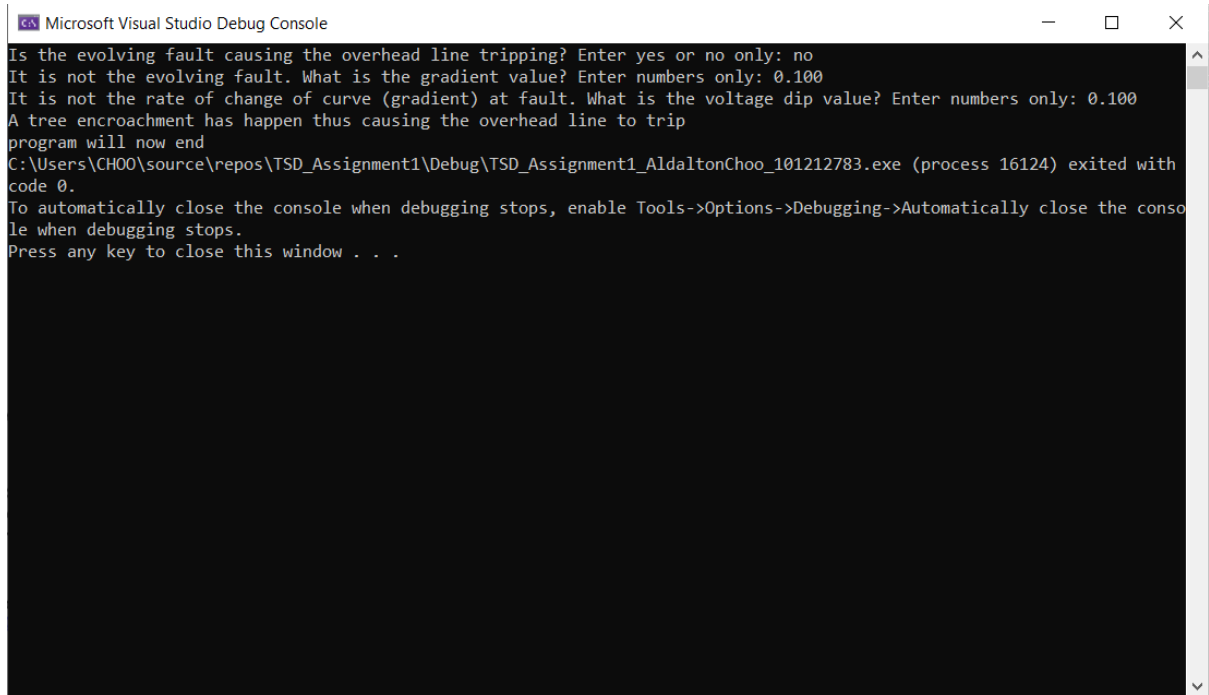
```
Microsoft Visual Studio Debug Console
Is the evolving fault causing the overhead line tripping? Enter yes or no only: yes
It is the evolving fault that caused a CT explosion to happen thus causing the overhead line to trip
program will now end
C:\Users\CH00\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe (process 6560) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

*Figure (1): Output 1 showing CT explosion is the cause for overhead line tripping*



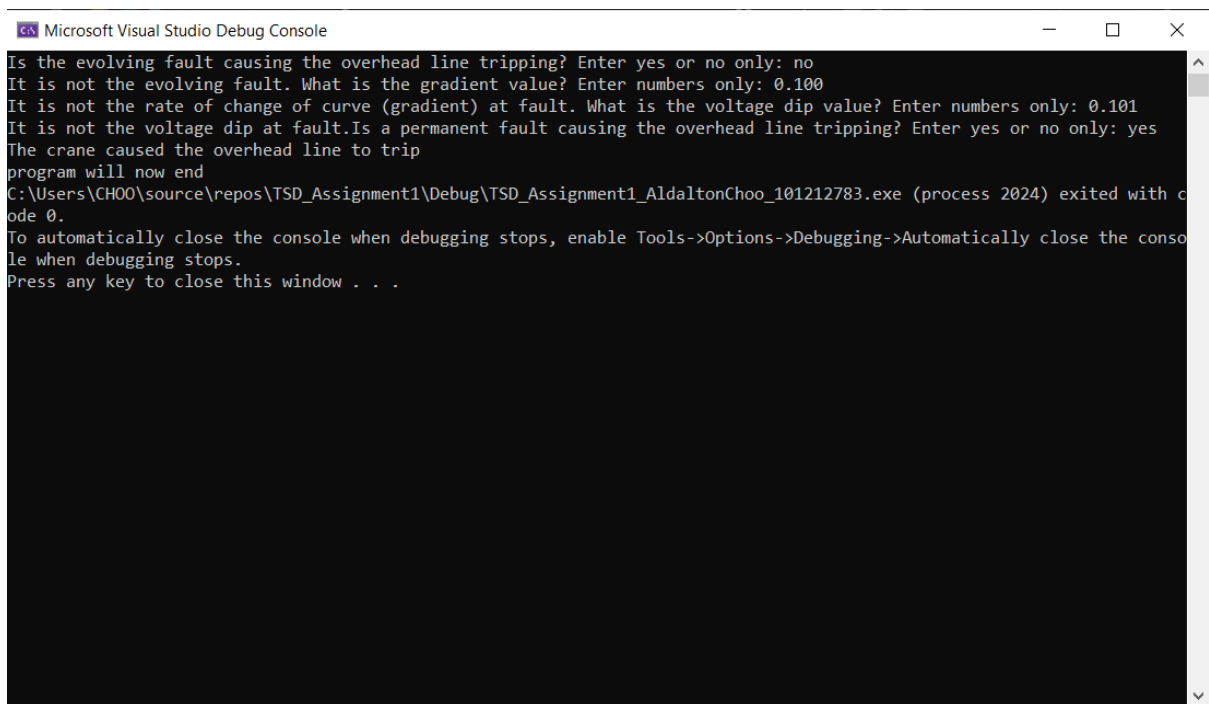
```
Microsoft Visual Studio Debug Console
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.099
A tree encroachment has happen thus causing the overhead line to trip
program will now end
C:\Users\CH00\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe (process 9404) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

*Figure (2): Output 2 showing Tree encroachment is the cause for overhead line tripping*



```
Microsoft Visual Studio Debug Console
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0.100
A tree encroachment has happen thus causing the overhead line to trip
program will now end
C:\Users\CH00\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe (process 16124) exited with
code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```

*Figure (3): Output 3 showing Tree encroachment is the cause for overhead line tripping*



```
Microsoft Visual Studio Debug Console
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0.101
It is not the voltage dip at fault.Is a permanent fault causing the overhead line tripping? Enter yes or no only: yes
The crane caused the overhead line to trip
program will now end
C:\Users\CH00\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe (process 2024) exited with c
ode 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```

*Figure (4): Output 4 showing A crane is the cause for overhead line tripping*

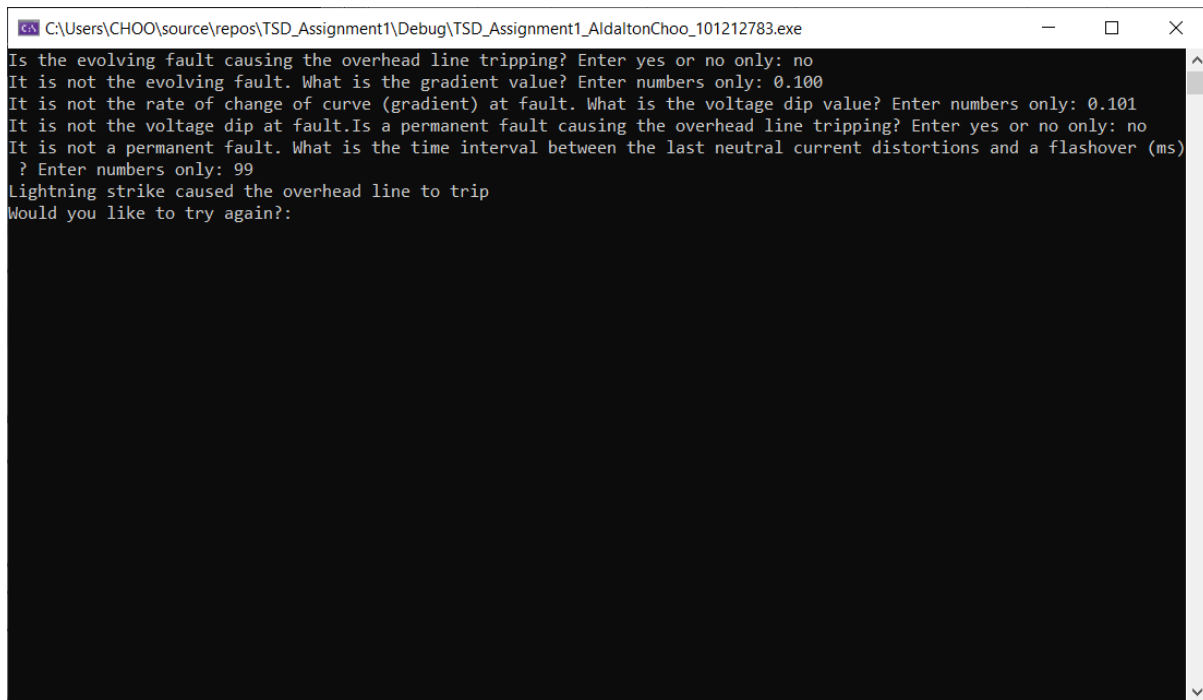
```
C:\Users\CHOO\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0.101
It is not the voltage dip at fault. Is a permanent fault causing the overhead line tripping? Enter yes or no only: no
It is not a permanent fault. What is the time interval between the last neutral current distortions and a flashover (ms)
? Enter numbers only: 100
Pollution caused the overhead line to trip
Would you like to try again?:
```

*Figure (5): Output 5 showing pollution is the cause for overhead line tripping*

```
C:\Users\CHOO\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0.101
It is not the voltage dip at fault. Is a permanent fault causing the overhead line tripping? Enter yes or no only: no
It is not a permanent fault. What is the time interval between the last neutral current distortions and a flashover (ms)
? Enter numbers only: 99
Lightning strike caused the overhead line to trip
Would you like to try again?:
```

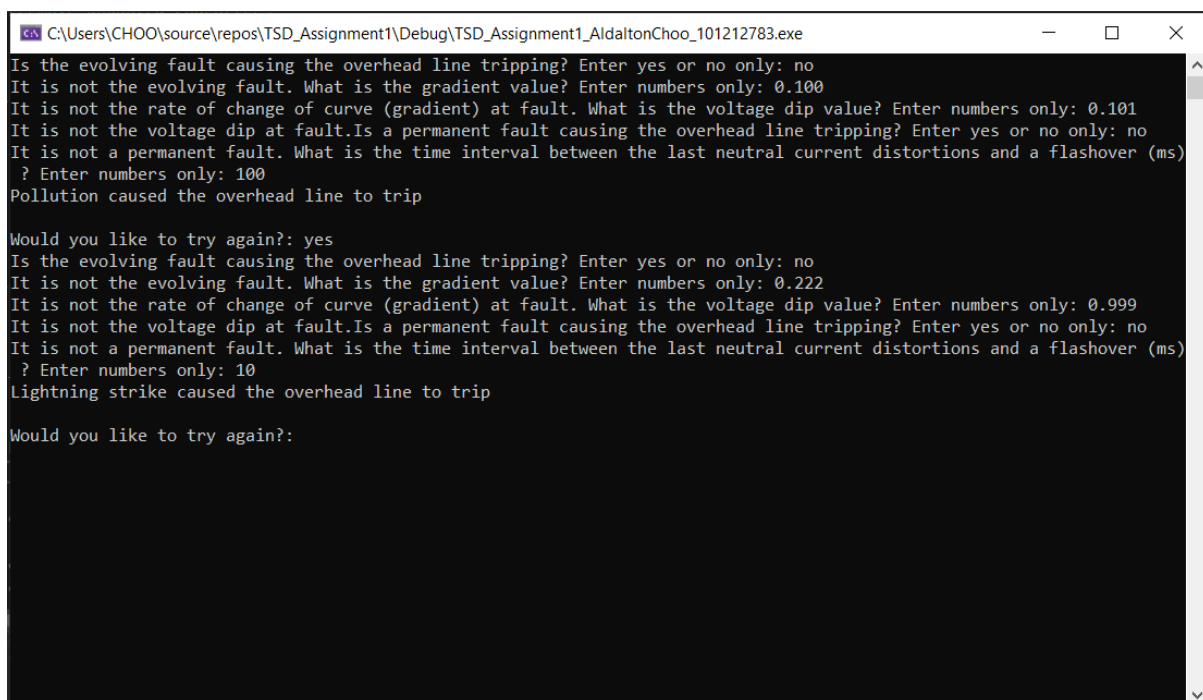
*Figure (6): Output 6 showing Lightning strike is the cause for overhead line tripping*

b)



```
C:\Users\CHOO\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0.101
It is not the voltage dip at fault. Is a permanent fault causing the overhead line tripping? Enter yes or no only: no
It is not a permanent fault. What is the time interval between the last neutral current distortions and a flashover (ms)
? Enter numbers only: 99
Lightning strike caused the overhead line to trip
Would you like to try again?:
```

Figure (7): Challenge task 1 part 1 Asking user if they want to repeat the process



```
C:\Users\CHOO\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0.101
It is not the voltage dip at fault. Is a permanent fault causing the overhead line tripping? Enter yes or no only: no
It is not a permanent fault. What is the time interval between the last neutral current distortions and a flashover (ms)
? Enter numbers only: 100
Pollution caused the overhead line to trip
Would you like to try again?: yes
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0.101
It is not the voltage dip at fault. Is a permanent fault causing the overhead line tripping? Enter yes or no only: no
It is not a permanent fault. What is the time interval between the last neutral current distortions and a flashover (ms)
? Enter numbers only: 10
Lightning strike caused the overhead line to trip
Would you like to try again?:
```

Figure (8): Challenge task 1 part 2 If user enters yes, the whole process is repeated

```
Microsoft Visual Studio Debug Console
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0.101
It is not the voltage dip at fault. Is a permanent fault causing the overhead line tripping? Enter yes or no only: no
It is not a permanent fault. What is the time interval between the last neutral current distortions and a flashover (ms)
? Enter numbers only: 100
Pollution caused the overhead line to trip

Would you like to try again?: yes
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.222
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0.999
It is not the voltage dip at fault. Is a permanent fault causing the overhead line tripping? Enter yes or no only: no
It is not a permanent fault. What is the time interval between the last neutral current distortions and a flashover (ms)
? Enter numbers only: 10
Lightning strike caused the overhead line to trip

Would you like to try again?: no
Program will now end. Thanks for participating.

C:\Users\CH00\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe (process 7940) exited with c
ode 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```

*Figure (9): Challenge task 1 part 3 If user enters no, the program will terminate*

```
C:\Users\CHOO\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe
Is the evolving fault causing the overhead line tripping? Enter yes or no only: 32132141
Invalid input. Only yes or no is accepted. Please try again
Is the evolving fault causing the overhead line tripping? Enter yes or no only: #@#!@#!%!
Invalid input. Only yes or no is accepted. Please try again
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: notanumber
Invalid input. Only numbers are accepted. Please try again
It is not the evolving fault. What is the gradient value? Enter numbers only: #@#!@#!@#!
Invalid input. Only numbers are accepted. Please try again
It is not the evolving fault. What is the gradient value? Enter numbers only: notanumber
Invalid input. Only numbers are accepted. Please try again
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only:
```

*Figure (10): Challenge task 2 part 1 input validation for both binary value and real number input*

```
C:\Users\CHOO\source\repos\TSD_Assignment1\Debug\TSD_Assignment1_AldaltonChoo_101212783.exe
Is the evolving fault causing the overhead line tripping? Enter yes or no only: 32132141
Invalid input. Only yes or no is accepted. Please try again
Is the evolving fault causing the overhead line tripping? Enter yes or no only: #@#!@#!%!
Invalid input. Only yes or no is accepted. Please try again
Is the evolving fault causing the overhead line tripping? Enter yes or no only: no
It is not the evolving fault. What is the gradient value? Enter numbers only: notanumber
Invalid input. Only numbers are accepted. Please try again
It is not the evolving fault. What is the gradient value? Enter numbers only: #@#!@#!@#!
Invalid input. Only numbers are accepted. Please try again
It is not the evolving fault. What is the gradient value? Enter numbers only: notanumber
Invalid input. Only numbers are accepted. Please try again
It is not the evolving fault. What is the gradient value? Enter numbers only: 0.100
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: -1000
Only positive numbers allowed and value bigger than zero allowed
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only: 0
Only positive numbers allowed and value bigger than zero allowed
It is not the rate of change of curve (gradient) at fault. What is the voltage dip value? Enter numbers only:
```

*Figure (11) Challenge task 2 part 2 users are not allowed to enter negative values or value smaller than zero.*