Green University of Bangladesh
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Course Code: CSE 304 Section: DK

Lab Project Name: Vehicle fuel usage management system

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Lab Project Status

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Comments: ..... **Date: .....**

Table of Contents

Chapter 1

Introduction

1.1 Introduction

The project is a Vehicle fuel usage management system with fuel usage and cost estimation. With the help of this system people can have a clear idea about their fuel usage and also can keep track of cost of the fuel.

1.2 Design Goals

A very recent problem in our country is the sudden rise in fuel oil for vehicles. This problem gave birth to various problems like increased fares for transport vehicles like buses, creating mass distress in public's mind. So, this system is trying to reduce the cost by using some methods.

• Efficient usage of fuel oil

• Give estimated usage of fuel for a destination

• To create a fuel usage management system.

• Calculating required fuel usage and cost based on distance

• Save and store fuel usage data

Chapter 2

Development of the Project

2.1 Declaration of variables

```
include 'emu8086.inc'
ORG    100h
.MODEL SMALL
.STACK 100H
.DATA
distance DW ?
oil_reserve DW ?
needed_oil DW ?
per_km_litre dw 2
remaining_oil_after_use dw ?
cost dw ?
cost_after_use dw ?
```

At first we have taken the variables needed for the assembly program. Where all the calculated results will be stored.

2.2 User inputs

```
.CODE
MAIN PROC
mov ax, @data
mov ds, ax
start:
printn ''
printn '               *****Vehicle Fuel Usage Management System*****           '
printn ''
printn ''
printn 'To begin enter the amount of oil reserve in your vehicle: '
CALL   scan_num       ; get number in CX.
printn ''
MOV    oil_reserve, cx
MOV    bx,oil_reserve
printn ''
printn 'Enter the distance that will be covered by the vehicle: '
CALL   scan_num
MOV    distance, CX
printn ''
printn ''
printn 'Enter fuel cost per litres in city: '
CALL   scan_num       ; get number in CX.
MOV cost , cx
```

At the very beginning of main procedure we are asking for inputs from the user. We're taking inputs for the amount of fuel available in the user vehicle. Then the distance to be covered by the vehicle. And the fuel cost of the user's city.

2.3 Calculations

```
mov ax,distance
mul per_km_litre
mov needed_oil,ax
mov bx, needed_oil
mov dx, oil_reserve
cmp bx, dx
ja  error
sub dx,bx
mov remaining_oil_after_use, dx
mov ax, needed_oil
mul cost
mov bx,ax
mov cost_after_use , bx
```

Here, we are calculating the results from the given inputs. Distance is being multiplied
By per km usage of fuel then subtracting needed fuel from fuel reserve. We got the remaining fuel.

2.4 Printing

```
printn '      ******************************************************'
printn '      *'
printn '      *'
print  '      *        Current Oil fuel Reserve: '
mov ax, oil_reserve
call print_num
print  ' litres'
printn ''
print  '      *        Distance to be covered: '
mov ax, distance
call print_num
print  ' kilometers'
printn ''

print  '      *        Required fuel: '
mov ax, needed_oil
call print_num
print  ' litres'
printn ''
print  '      *        Fuel Cost for required fuel: '
mov ax, cost_after_use
call print_num
print  ' dollars'
printn ''
print  '      *        Fuel Reserve after usage: '
mov ax, remaining_oil_after_use
call print_num
print  ' litres'
printn ''
printn '      *'
printn '      *'
printn '      ******************************************************'
```

Here, the results are being printed.

2.5 Options

```
printn '1. Refuel'
printn '2. Check status again'
printn '3. Reset '
printn '4. End '

printn ''
print  'choose a option : '
mov ah, 1
int 21h
mov bl, al
sub bl, 48

cmp bl, 1

je refuel
```

Here we are giving the user to select from various options available.

2.6 emu 8086.inc

```
DEFINE_SCAN_NUM
DEFINE_PRINT_STRING
DEFINE_PRINT_NUM
DEFINE_PRINT_NUM_UNS
DEFINE_PTHIS
```

These are already defined procedure in emu 8086 inc file for works like printing and scanning. Print prints strings. Print_num prints the value stored in ax register and scan_num stores the Input in cx register.

Chapter 3

Performance Evaluation

3.1 Simulation Environment/ Simulation Procedure

As Simulation Environment we are using emu 8086 emulator.

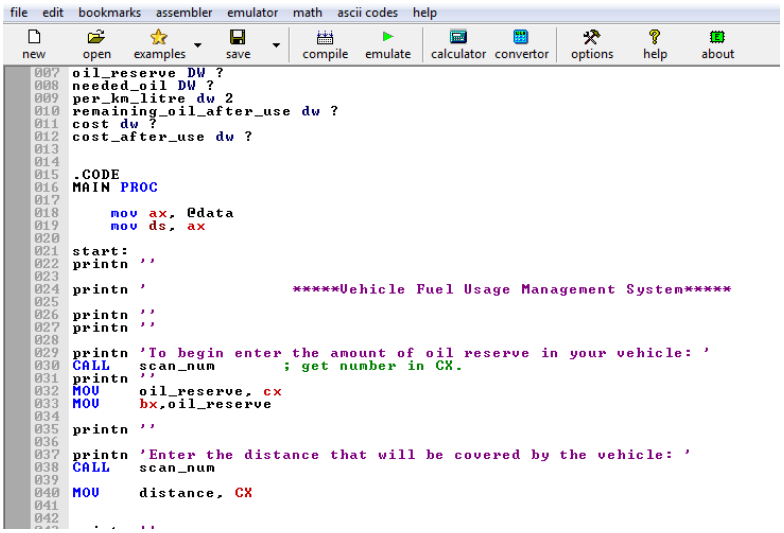
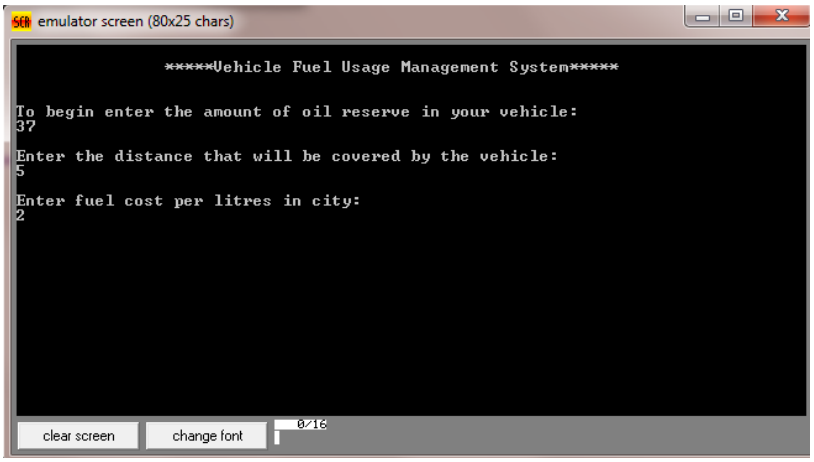


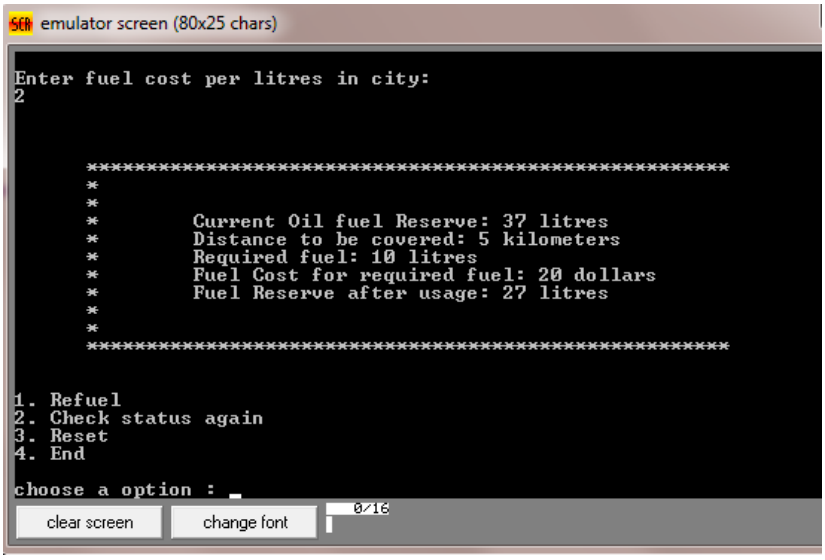
Figure 3.1: emu8086 emulator

3.2 Results and Discussions

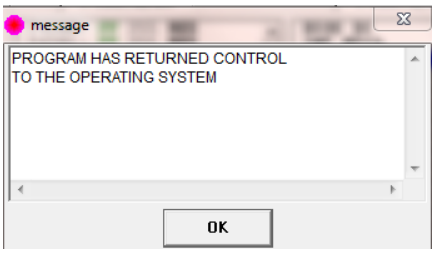
3.2.1 Results



Here we are taking inputs from the user.



Fuel cost per km is 2, we have given distance of 5 Kilometers
That means 10 litres fuel is used to cover the distance.
Here the results are correct as per calculation.



The options are also working perfectly.

3.2.2 Analysis and Outcome

We have gotten outcome as per our earlier analysis. The objectives was achieved.
We have calculated required fuel usage and cost based on distance. Also saved and stored the Fuel usage data.

Chapter 4

Conclusion

4.1 Introduction

The goal of the project was to create a system that will present ways to efficiently use fuel oil by giving a calculating fuel usage and cost by giving destination's distance. We made a system like this.

4.1 Practical Implications

This system can be used in real life as a fuel management system by using a microprocessor Similar to 8086.

4.2 Scope of Future Work

Features like adding locations can be added in the future. Also things like finding the shortest distance to reach a destination and calculating fuel usage for alternative routes can be added.

References

https://jbwyatt.com/253/emu/asm_tutorial_05.html

https://www.philadelphia.edu.jo/academics/qhamarsheh/uploads/Lecture%2021%20MS-DOS%20Function%20Calls%20INT%2021h.pdf