

Preparing a Computer Program with Foxpro 9 Language for Lube Oil Laboratory in Dora Refinery

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Abstract

The Lube oil Dora refinery needs a computer program to automatize Its activities, because now most of laboratories in the world use computer programs to receive data and use standards informations and comparing them to get the suitable results, So this computer program is done to make the laboratory in a better form.

The computer program takes the lube oil sample name and gives its specifications and tells the analyst all the tests required to make on it , and after the selection of the analyst , then make the tests , the program will get the results , and show the standard informations and comparing them by the analyst , after that the program will show the report required for any period of time.

The program has an ability to show and print data at any time , and also edit, delete, add, and exit from the data files of the lube oils informations and standards and the test results.

This program was done by using a laptop with a suitable specifications and programming by FOXPRO 9 computer language.

Keywords: lube oil, foxpro 9, computer program, dora refinery, lube oil laboratory

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I. Introduction

The objectives of this research are to change the manually work done daily in the laboratory to a work done with computer using a program written in Foxpro 9 language like the work of most companies works in the analysis of lubricating oil in the world.

Now more of 9000 company in the world use a computer program written with different computer languages to analyze lubricating oil in their laboratories, for example , Midor refinery in Egypt[1] , SGS testing and control services in Singapore[2], Oil analyzers in Canada[3], Atlas Co. in Mumbai in India[4], VPS Co. in USA[5], D-A-Lubricant Co. in Lebanon[6], Metslab Co. in Abu Dhabi[7], Oil testing Lab Bureau Veritas in USA[9] , Jordan petroleum refinery Co. LTD in Jordan⁽⁹⁾, and Intertek Co. in USA[10] etc .

II. Materails Required:

1. This computer program is done with a Laptop has the following specifications:

Device name	DESKTOP-KNC7LJM
Processor	Intel(R) Core(TM) i7-7500U CPU @ 2.70GHz 2.90 GHz
Installed RAM	8.00 GB (7.80 GB usable)
Device ID	36E1DDC9-0676-4208-A136-A9288FCC5630
Product ID	00329-00000-00003-AA164
System type	64-bit operating system, x64-based processor
Pen and touch	No pen or touch input is available for this display
Edition	Windows 10 Enterprise
Version	22H2
Installed on	6/11/2023
OS build	19045.4170
Experience	Windows Feature Experience Pack 1000.19054.1000.0

2. Foxpro 9 computer language.

III. Theory:

The theory of this work depends on the activities of Lube oil Laboratory in Dora Refinery which is :

1. The samples brought daily to the laboratory by a sample collector.
2. The operator of this computer program will define the lube oil name and use the computer program to print the specifications of this lube oil
3. The specification paper will send to the analyst to choose the tests required to be done on this sample , and collects the results
4. The operator will introduce the results in the computer program.
5. Then compare these results with the allowable standards.
6. All these data and results will be saved by the computer program.
7. The computer program will type any report required by the staff, the main menu is :

No.	selections
1	Tests
2	Results
3	Certificate
4	Specifications
5	Result Data
6	Comparing Data
7	Time Period report
8	Return

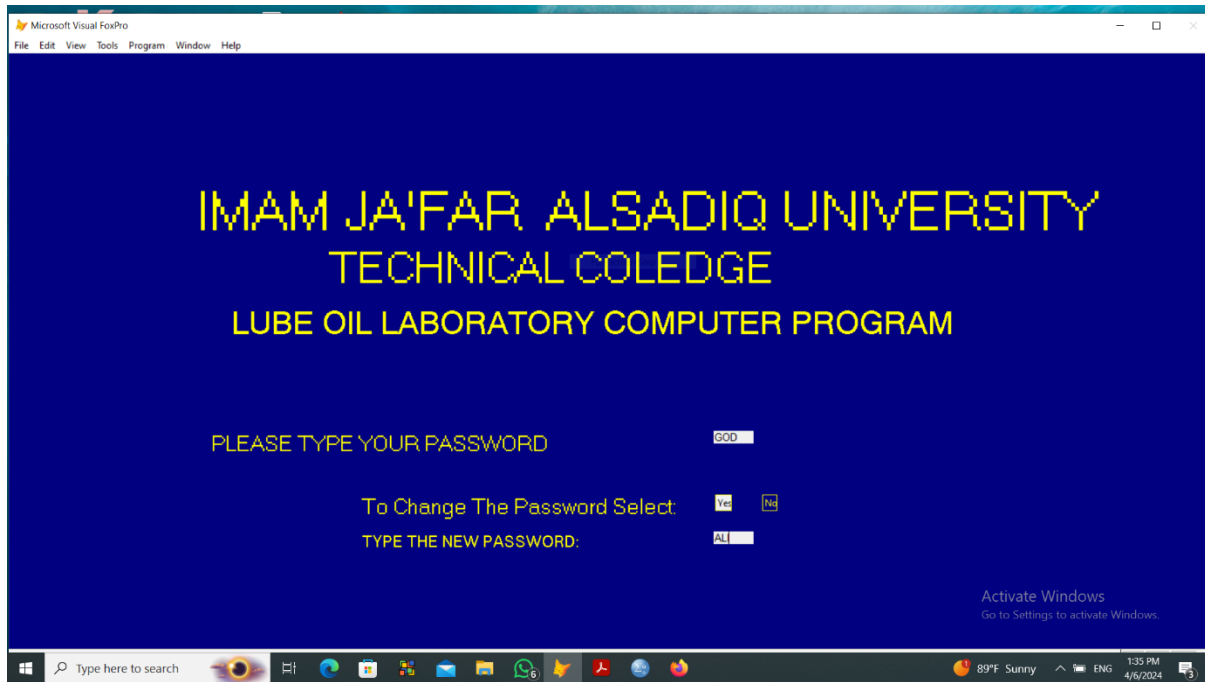
IV. Work Procedure:

To use the computer program , do the followings:

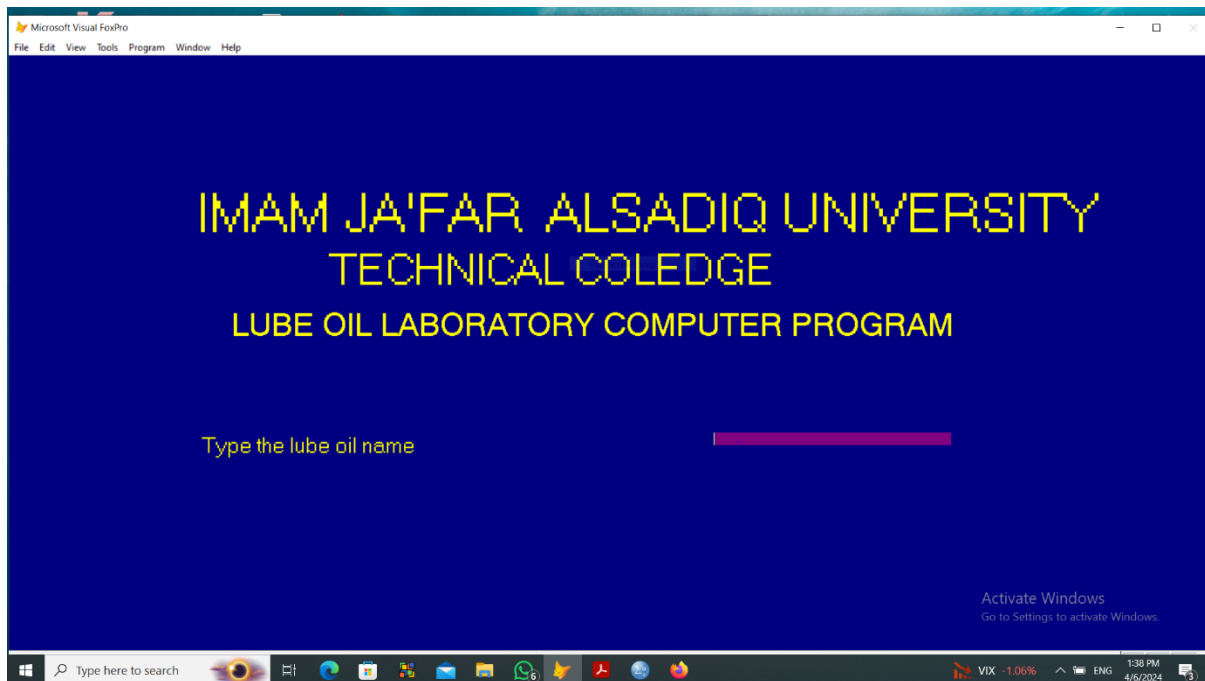
1. Click on the logo of the computer program in the Desktop :



2. Type the password :
the password can be changed by the operator at any time.



3. Choose the required choice from the main menu which illustrated above, if the first selection is choosed , the program ask the name of lube oil:



4. After typing the lube oil name , it's specifications will be shown



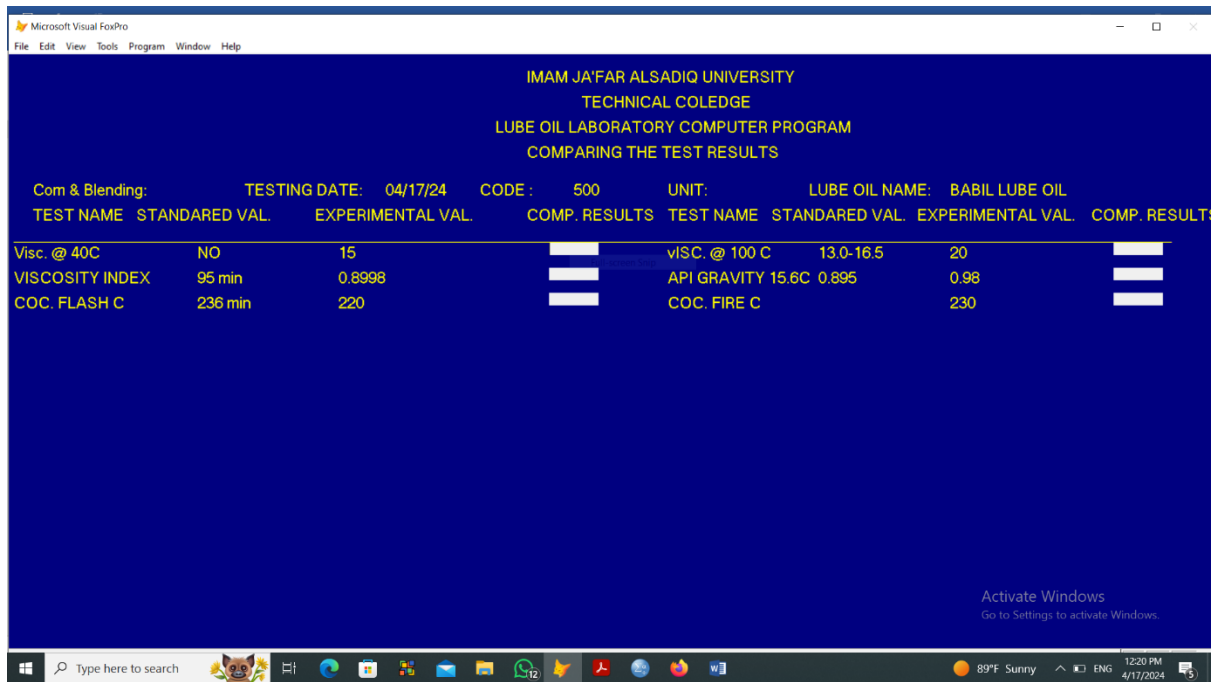
The above page will be printed and sent to the analyst to choose the required tests, then the test results will be collected.

5. The test results will be introduced in the computer program by the operator:



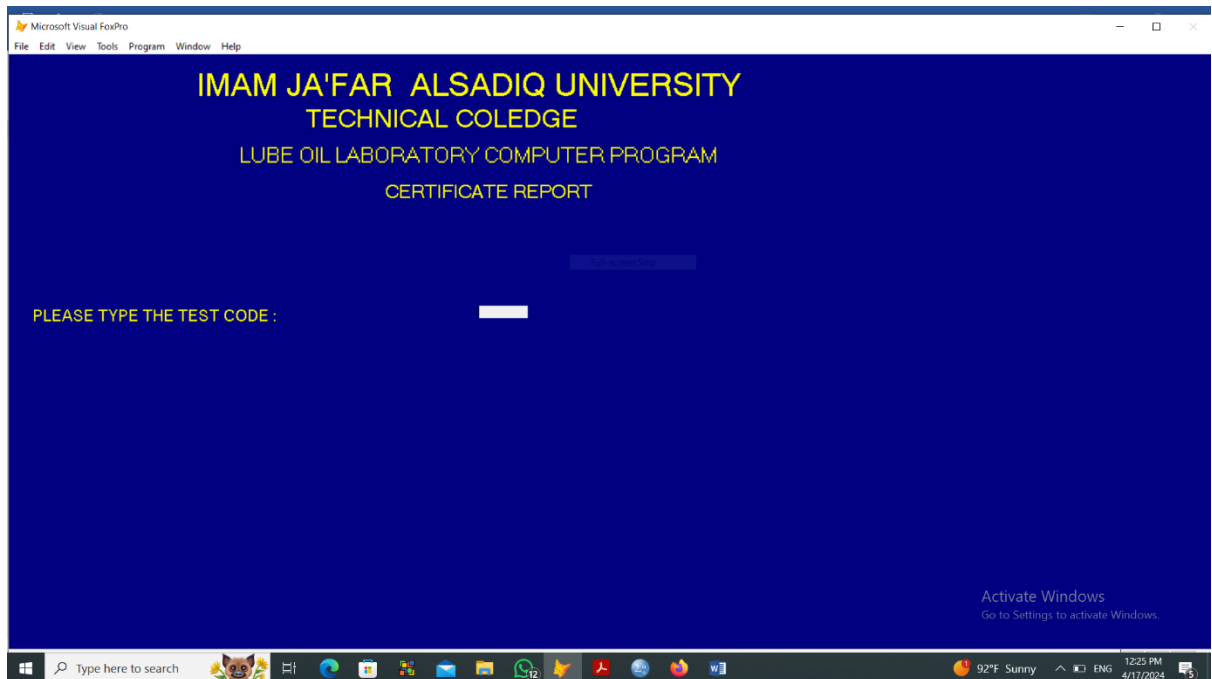
The program let a choice to print the data or not, and after choosing , the operator will go to the down step.

6. Comparing the results with the standard data.



After filling the comparing data , the program will return to the main menu.

7. Click the certificate choice from the main menu : the program ask typing the code of the test :



After typing the code of the test, the following page will occur :

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TEST NAME	STANDARED VAL.	EXPERIMENTAL VAL.	COMP. RESULTS	TEST NAME	STANDARED VAL.	EXPERIMENTAL VAL.	COMP. RESULTS
Com & Blending: A.P.		TESTING DATE: 01/01/24	CODE : 124	UNIT: REFINING	LUBE OIL NAME: BABIL LUBE OIL		
Visc. @ 40C	NO	3	1	VISC. @ 100 C	13.0-16.5	15.0	2
VISCOSITY INDEX	95 min	98	3	API GRAVITY 15.6C	0.895	0.896	4
COC. FLASH C	236 min	240	5	COC. FIRE C		260	6
POUR POINT C	-9 max	-12	7	T.B.N. MG KOH	5.0 min	6	8
SULPHATED ASH WT%	0.62-0.72	0.05	9	COLOR		RED	10
PHOSPHORUS		5	11	H2O VOL.	neg.	1	12
FOAM @ 24C	nil	NIL	13	FOAM @ 93.3C		NIL	14
FOAM@24C AFTER COC		23	15	Sulfur wt%:		1	16
Rust Test:		NIL	17	Dielec. Str.(2.5mm K.V		NIL	18
Timken Load lb:		5	19	Air Release Minit.:		5	20
Soluble wt%:		4	21	Phenol Antioxid:		NIL	22
Ca wt%:		NIL	23	H2O ppm		1	24
Corrosive Sulfur:		NIL	25	PM FLASH C		250	26
ZN WT%:		0.1	27	SAP.MG/KOH :		7	28
NEUT. MG KOH:		0.3	29	SENO.SEC :		5	30
RAM.RES WT%:		1	31	ASH WT% :		2	32

All the informations about the test (specifications of the lube oil, the standard data, the result of the tests done and the comparing results) will occur , and there is a choice to print the certificate paper or not. After that the program returns to the main menu.

8. Click the specification button , the program asks to type the lube oil name :



After typing the lube oil name , the following page will appear :



Which contains the specifications of the required lube oil, also the program let a choice to print the data or not, after that four choices (EDIT, ADD, DELETE, and EXIT), if the operator clicks the EDIT choice, the following page will be occur:



The program let the operator to change the data as he likes, then the program will save the new data, and return to the main menu.

9. If the operator clicks the ADD choice , the following page will occur :



The program let the operator to add a new data , then the program will save the new data, and return to the main menu.

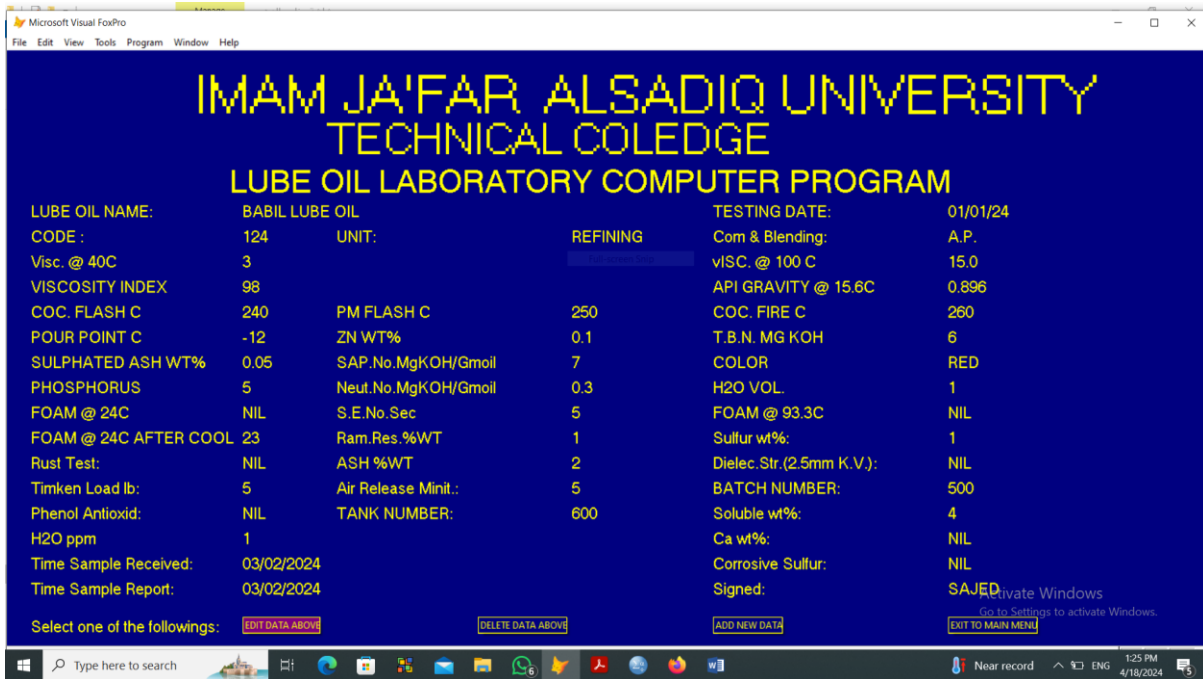
10. If the operator clicks the DELETE choice, the program will delete this lube oil specifications and returns to the main menu.

11. If the operator clicks the EXIT choice, the program will returns to the main menu.

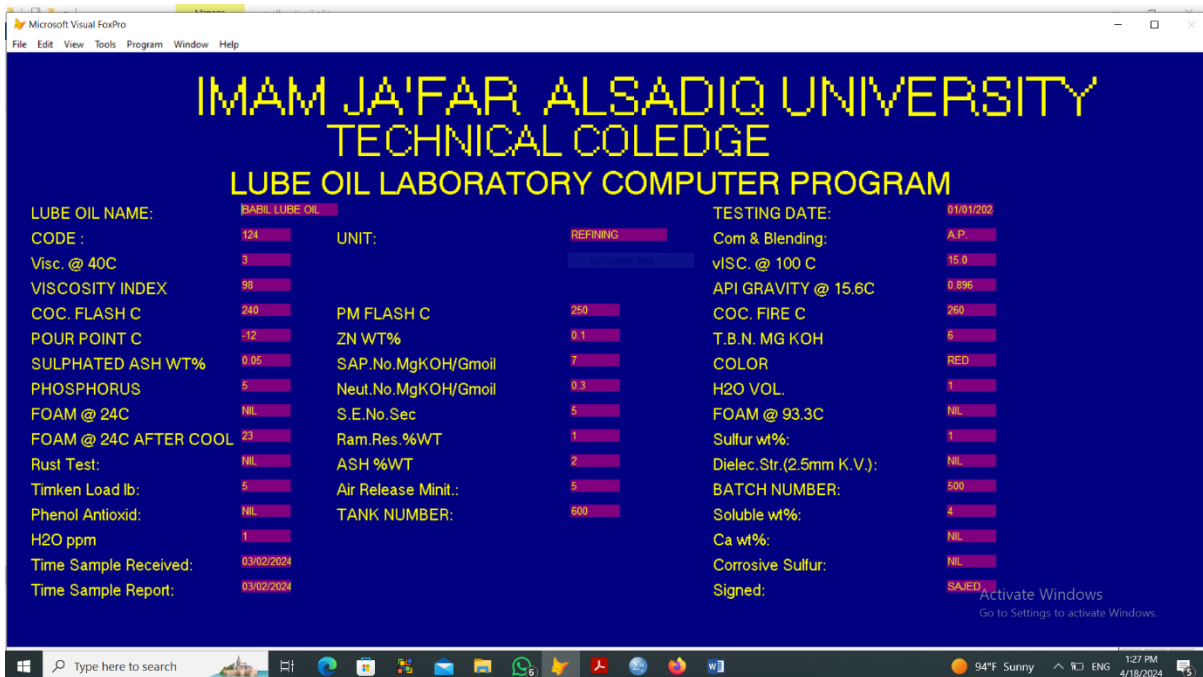
12. If the operator clicks the RESULT DATA choice from the main menu , the program asks to type the test code:



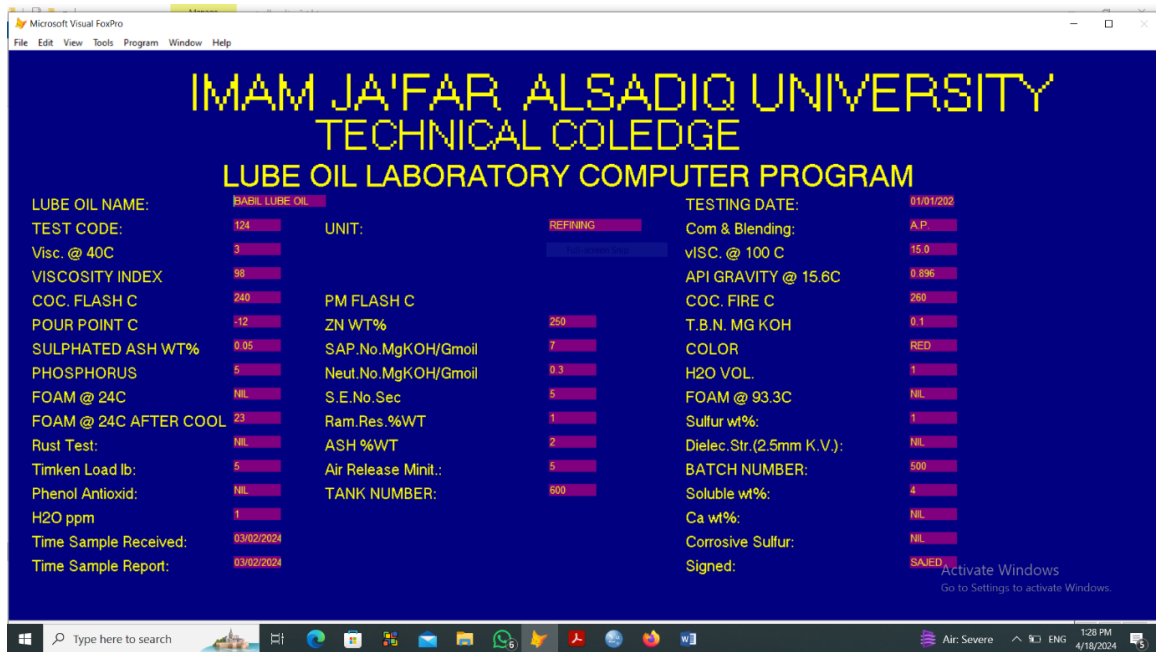
After typing the code of the test , the following page will appear:



The operator can choose one of the following (EDIT, ADD, DELETE & EXIT), if he click the EDIT choice the following page will occur:



The operator can change and correct the data, then the program return to the main menu, if the operator click the ADD button , the following page will occur:



The operator can add new result data, and then return to the main menu, if the operator click the DELETE button, the program will delete the current test results and return to the main menu, and if the operator click the EXIT button , the program returns to the main menu.

13. If the operator clicks the COMPARING DATA choice from the main menu , the program asks to type the test code:



After typing the test code , the following page will occur:

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TEST NAME	STANDARED VAL.	EXPERIMENTAL VAL.	COMP. RESULTS	TEST NAME	STANDARED VAL.	EXPERIMENTAL VAL.	COMP. RESULT
Visc. @ 40C	NO	3	1	visc. @ 100 C	13.0-16.5	15.0	2
VISCOSITY INDEX	95 min	98	3	API GRAVITY 15.6C	0.895	0.896	4
COC. FLASH C	236 min	240	5	COC. FIRE C		260	6
POUR POINT C	-9 max	-12	7	T.B.N. MG KOH	5.0 min	6	8
SULPHATED ASH WT%	0.62-0.72	0.05	9	COLOR		RED	10
PHOSPHORUS		5	11	H2O VOL.	neg.	1	12
FOAM @ 24C	nil	NIL	13	FOAM @ 93.3C		NIL	14
FOAM @ 24C AFTER CO		23	15	Sulfur wt%:		1	16
Rust Test:		NIL	17	Dielec. Str. (2.5mm K.V		NIL	18
Timken Load lb:		5	19	Air Release Minit.:		5	20
Soluble wt%:		4	21	Phenol Antioxid:		NIL	22
Ca wt%:		NIL	23	H2O ppm		1	24
Corrosive Sulfur:		NIL	25	PM FLASH C		250	26
ZN WT%:		0.1	27	SAP.MG/KOH :		7	28
NEUT. MG KOH:		0.3	29	SENO.SEC :		5	30
RAM.RES.WT%:		1	31	ASH WT% :		2	32

Buttons: EDIT DATA ABOVE, DELETE DATA ABOVE, ADD NEW DATA, EXIT TO MAIN MENU

If the operator select the EDIT button , the following page will occur:

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TEST NAME	STANDARED VAL.	EXPERIMENTAL VAL.	COMP. RESULTS	TEST NAME	STANDARED VAL.	EXPERIMENTAL VAL.	COMP. RESULT
Visc. @ 40C	NO	1	5	visc. @ 100 C	13.0-16.5	2	6
VISCOSITY INDEX	95 min	3	7	API GRAVITY 15.6C	0.895	4	8
COC. FLASH C	236 min	5	9	COC. FIRE C		6	11
POUR POINT C	-9 max	7	12	T.B.N. MG KOH	5.0 min	8	14
SULPHATED ASH WT%	0.62-0.72	9		COLOR		10	17
PHOSPHORUS		11	18	H2O VOL.	neg.	12	
FOAM @ 24C	nil	13		FOAM @ 93.3C		14	
FOAM @ 24C AFTER CO		15		Sulfur wt%:		16	
Rust Test:		17		Dielec. Str. (2.5mm K.V		18	
Timken Load lb:		19		Air Release Minit.:		20	
Soluble wt%:		21		Phenol Antioxid:		22	
Ca wt%:		23		H2O ppm		24	
Corrosive Sulfur:		25		PM FLASH C		26	10
ZN WT%:		27	13	SAP.MG/KOH :		28	16
NEUT. MG KOH:		29	0.3	SENO.SEC :		30	
RAM.RES.WT%:		31		ASH WT% :		32	

After editing the above data, the program return to the main menu, if the operator select the DELETE button , the program will ask to type the test code and after typing the test code , it will delete this test results with its comparing results.

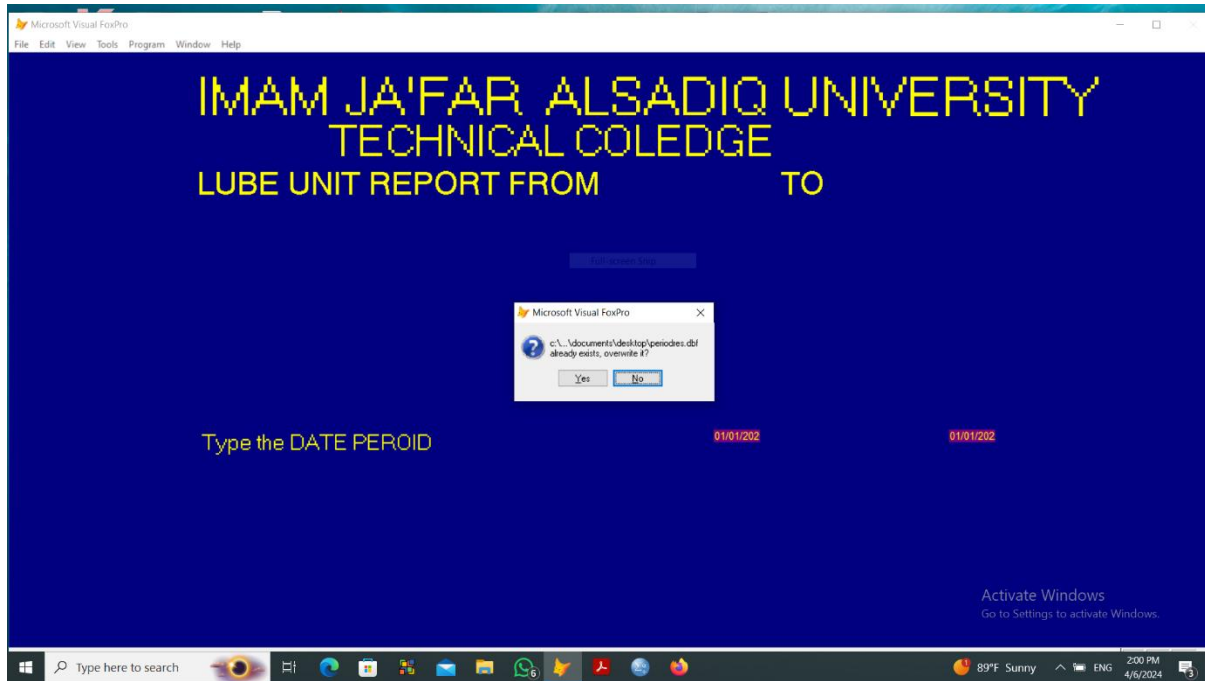
If the operatore select the ADD button, the program will ask to type the test code , and after typing the test code , the following page will occur:

TEST NAME	STANDARED VAL.	EXPERIMENTAL VAL.	COMP. RESULTS	TEST NAME	STANDARED VAL.	EXPERIMENTAL VAL.	COMP. RESULT
Visc. @ 40C	NO	1	5	VISC. @ 100 C	13.0-16.5	2	6
VISCOSITY INDEX	95 min	3	7	API GRAVITY 15.6C	0.895	4	8
COC. FLASH C	236 min	5	9	COC. FIRE C		6	11
POUR POINT C	-9 max	7	12	T.B.N. MG KOH	5.0 min	8	14
SULPHATED ASH WT%	0.62-0.72	9		COLOR		10	17
PHOSPHORUS		11	18	H2O VOL.	neg.	12	
FOAM @ 24C	nil	13		FOAM @ 93.3C		14	
FOAM @ 24C AFTER CO		15		Sulfur wt%:		16	
Rust Test:		17		Dielec. Str.(2.5mm K.V		18	
Timken Load lb:		19		Air Release Minit.:		20	
Soluble wt%:		21		Phenol Antioxid:		22	
Ca wt%:		23		H2O ppm		24	
Corrosive Sulfur:		25		PM FLASH C		26	10
ZN WT%:		27	13	SAP.MG/KOH :		28	16
NEUT. MG KOH:		29	0.3	SENO.SEC :		30	
RAM.RES.WT%:		31		ASH WT% :		32	

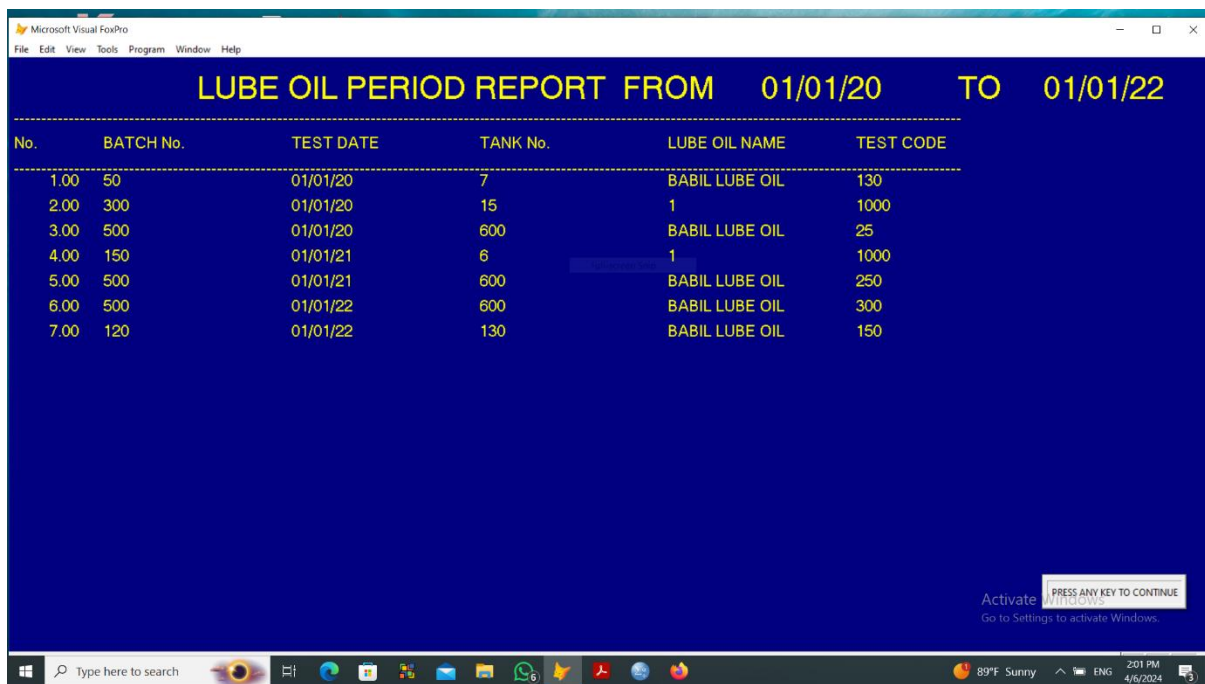
After adding the new data , the program will return to the main menu.

14. If the operator clicks the TIME PERIOD REPORT choice from the main menu , the program asks to type the time period required:

After typing the time period , the program prepare a file data for this period only from the original file , and ask if the operator wants to rewrite the previous file or not , selecting YES to delete the old file and type a new file with the same name.



Then the program will type all the tests done during this time period (10 tests in one page, and wait the operator to click PRESS ANY KEY TO CONTINUE to see the new page until the results are finished.



When the operator click the final PRESS ANY KEY TO CONTINUE, the following page will occur to let the operator to choose if he want to print data or not.

No.	BATCH No.	TEST DATE	TANK No.	LUBE OIL NAME	TEST CODE
1		04/17/24		BABIL LUBE OIL	300
2		04/17/24		BABIL LUBE OIL	250
3		04/17/24		BABIL LUBE OIL	600
4		04/17/24		BABIL LUBE OIL	500

TO PRINT THE ABOVE DATA SELECT :

If the operator select YES the data will printed and return to the main menu, if NO the program will return to the main menu.

15. If the operator clicks the EXIT choice from the main menu , the program will exit to the desktop screen.

V. Conclusion:

By using thid computer program , the operator in the laboratory of Dora Refinery can:

1. Type the specifications of the lube oil prepared to test, and give it to the analyst to sign the suitable tests required.
2. Introduce the test results in the program , and give a comparing paper between the standard and experimental data , and let the analyst to compare between them and type the results of comparing.
3. Edit, delete, add new data to the file of informations about lube oils, test , and comparing results .
4. Give a report at any time about the tests done during and required period time.

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