FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING

System Programming and Compiler Construction

VI Semester (Computer) **Academic Year: 22-23**

Experiment No 1

AIM:

To write a program for implementing Symbol Table

ALGORITHM

Step1: Start the program for performing insert, display, delete, search and modify option in symbol table

Step2: Define the structure of the Symbol Table

Step3: Enter the choice for performing the operations in the symbol Table

Step4: If the entered choice is 1, search the symbol table for the symbol to be inserted. If the symbol is
already present, it displays “Duplicate Symbol”. Else, insert the symbol and the corresponding address in
the symbol table.

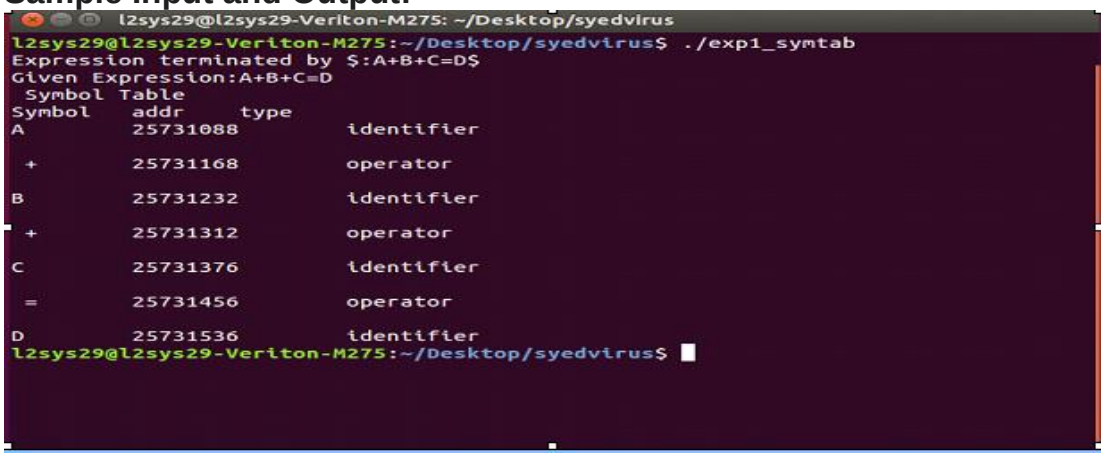
Step5: If the entered choice is 2, the symbols present in the symbol table are displayed.

Step6: If the entered choice is 3, the symbol to be deleted is searched in the symbol table.

Step7: If it is not found in the symbol table it displays “Label Not found”. Else, the symbol is deleted.

Step8: If the entered choice is 5, the symbol to be modified is searched in the symbol table.

Sample Input and Output:



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Code :

```
import string
import pandas as pd
import numpy as np
import random
import os.path
from csv import writer
from tabulate import tabulate
```

```
def take_input():
  print("1 . Create Table  2 . Search Table  3. Enter Symbol 4. Remove
Symbol 5. View Table 6 . Exit")
  n = int(input("Enter Your Choice "))
  return n
```

```
IDENTIFIERS = list(string.ascii_letters) + ['1','2','3','4','5','6','7'
,'8','9','0']
OPERATORS = ['+' ,'-' , '*','/','=']
INPUT_LIST = []
FILE_NAME = "Table_Data.csv"
COLUMN = ["SYMBOL",'ADDRESS','TYPE']

def create_table():
  print("Creating Table in Progress")
  global INPUT_LIST
  if(len(INPUT_LIST) > 0):
    for expression in INPUT_LIST:
      generate_table(expression)

    INPUT_LIST = []
  else:
    print("ENTER EXPRESSION FIRST")

def generate_table(expression):
  letters = [x for x in expression]
  data = {
      "SYMBOL":[],
      "ADDRESS":[],
```

```
      "TYPE":[]
  }
  try:
    file_read = pd.read_csv(FILE_NAME,index_col=[0])
    symbols = file_read['SYMBOL'].to_list()
  except FileNotFoundError:
    symbols = []
    pass

  for sym in letters:
    if not (sym in symbols) or len(symbols) == 0 :
      address = id(sym)
      data["ADDRESS"].append(address)
      data["SYMBOL"].append(sym)
      if sym in OPERATORS :
        data["TYPE"].append("operators")
      elif sym in IDENTIFIERS:
        data["TYPE"].append("identifiers")
    else:
      print(f"Sorry Unable To Update Table As {sym} already exits in Fi
le ")
      return

  # print(data)
  new_file = pd.DataFrame(data)

  try:
    old_file = pd.read_csv(FILE_NAME,index_col=[0])
    df = pd.concat([old_file , new_file], ignore_index= True)
    df.to_csv(FILE_NAME )
    print("SuccessFully Created Table")
  except FileNotFoundError:
    new_file.to_csv(FILE_NAME)
    print("File Created")

# generate_table("a=b+c-d*5")
```

```
def enter_input():
  expression = input("Enter Your Expression")
  # INPUT_LIST.append(expression)
  generate_table(expression)
```

```
def search_in_table(alphabet):
```

```
  try:
    file_read = pd.read_csv(FILE_NAME,index_col=[0])
    result = file_read[file_read['SYMBOL'] == alphabet]
    print(result)
  except FileNotFoundError:
    print("Sorry Couldnt Read File As It Does Not Exist")
    return

# search_in_table("C")
```

```
def remove_from_table(alpha):
  try:
    file_read = pd.read_csv(FILE_NAME ,index_col=[0])
    print(file_read['SYMBOL'])
    if alpha in file_read['SYMBOL'].to_list():
      new_file = file_read[file_read['SYMBOL'] != alpha]
      new_file.to_csv(FILE_NAME)
      print(f"{alpha} Removed From Table Data")
    else:
      print(f"{alpha} Does Not Exist in Table Data")
  except FileNotFoundError:
    print("Sorry Couldnt Read File As It Does Not Exist")
    return

# remove_from_table('M')
```

```
def view_table():
  try:
    file_read = pd.read_csv(FILE_NAME,index_col=[0])
    print(tabulate(file_read, headers='keys', tablefmt='psql'))
  except FileNotFoundError:
    print("Sorry Couldnt Read File As It Does Not Exist")
    return

# view_table()
```

```

while True:
  t = take_input()

  if t == 1 :
    # create table
    create_table()
  elif t == 2:
```

```
    #  search in table
    sym = input("Enter Alphabet To Be Searched....")
    search_in_table(sym)
  elif t == 3:
    # Enter Symbol
    enter_input()
  elif t == 4 :
    # Remove Symbo
    sym = input("Enter Symbol To Be Removed From Table")
    remove_from_table(sym)
  elif t == 5:
    # View Table
    view_table()
  elif t == 6:
    break;
  else:
    print("wrong Input")
```

Postlab Questions:

1. Explain different phases of compiler. Illustrate all the output after each phase for the following statement

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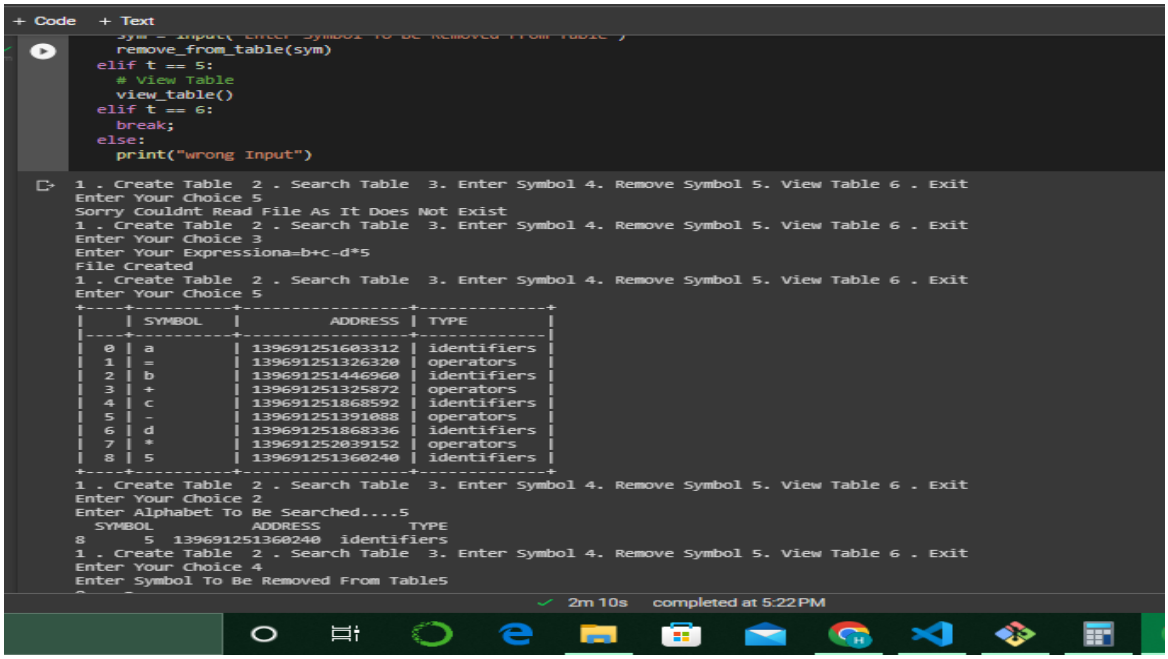
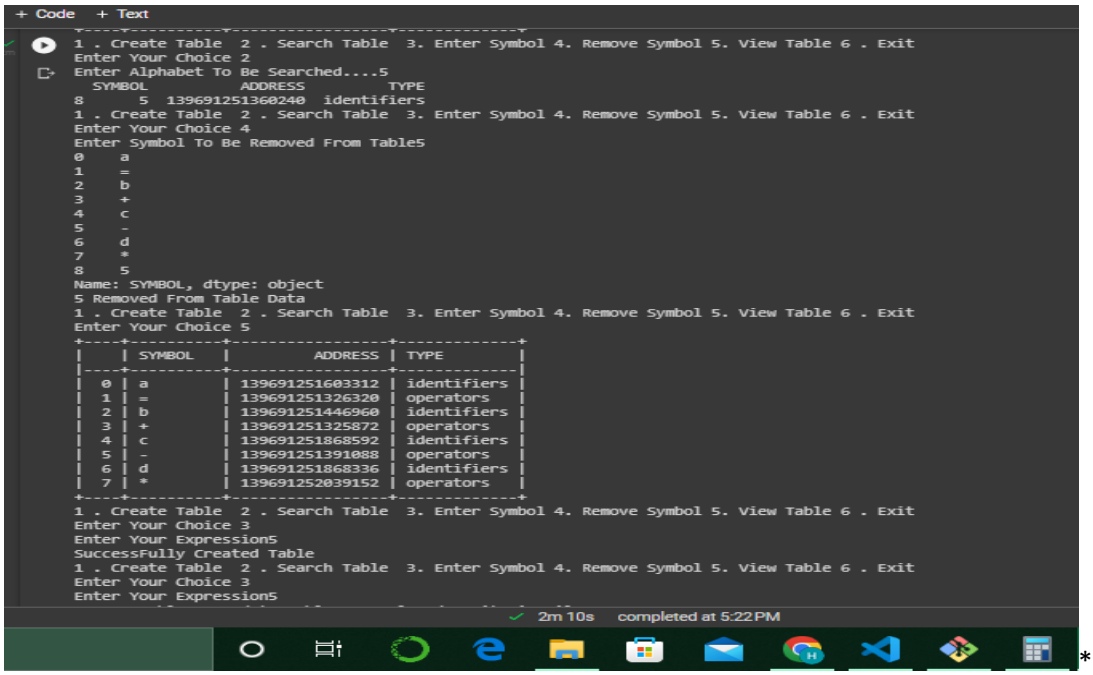
a= b +c -d





*5

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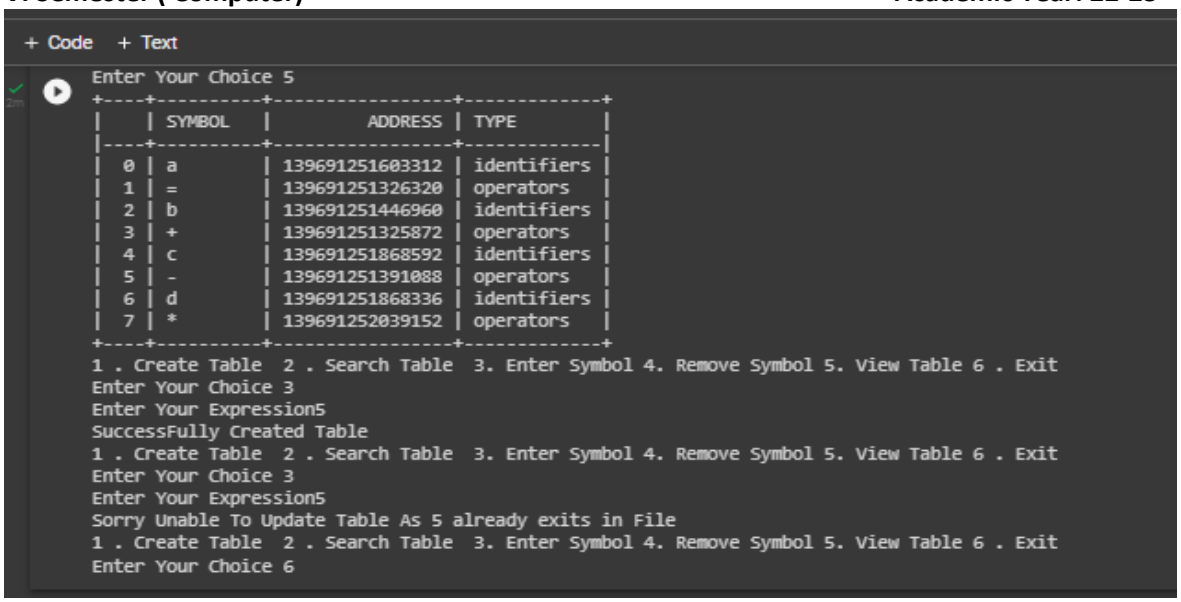

```
+ Code  + Text

Enter Your Choice 5
+----+----------+-----------------+-------------+
|    | SYMBOL   |         ADDRESS | TYPE        |
|----+----------+-----------------+-------------|
|  0 | a        | 139691251603312 | identifiers |
|  1 | =        | 139691251326320 | operators   |
|  2 | b        | 139691251446960 | identifiers |
|  3 | +        | 139691251325872 | operators   |
|  4 | c        | 139691251868592 | identifiers |
|  5 | -        | 139691251391088 | operators   |
|  6 | d        | 139691251868336 | identifiers |
|  7 | *        | 139691252039152 | operators   |
+----+----------+-----------------+-------------+
1 . Create Table  2 . Search Table  3. Enter Symbol 4. Remove Symbol 5. View Table 6 . Exit
Enter Your Choice 3
Enter Your Expression5
SuccessFully Created Table
1 . Create Table  2 . Search Table  3. Enter Symbol 4. Remove Symbol 5. View Table 6 . Exit
Enter Your Choice 3
Enter Your Expression5
Sorry Unable To Update Table As 5 already exits in File
1 . Create Table  2 . Search Table  3. Enter Symbol 4. Remove Symbol 5. View Table 6 . Exit
Enter Your Choice 6
```