# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.



### **COMPILER DESIGN**

**Submitted by** 

HARIKA N (1BM21CS071)

in partial fulfillment for the award of the degree of BACHELOR OF ENGINEERING in COMPUTER SCIENCE AND ENGINEERING



B.M.S. COLLEGE OF ENGINEERING (Autonomous Institution under VTU) BENGALURU-560019 Oct 2023-Feb 2024

B. M. S. College of Engineering,

## Bull Temple Road, Bangalore 560019 (Affiliated To Visvesvaraya Technological University, Belgaum) Department of Computer Science and Engineering



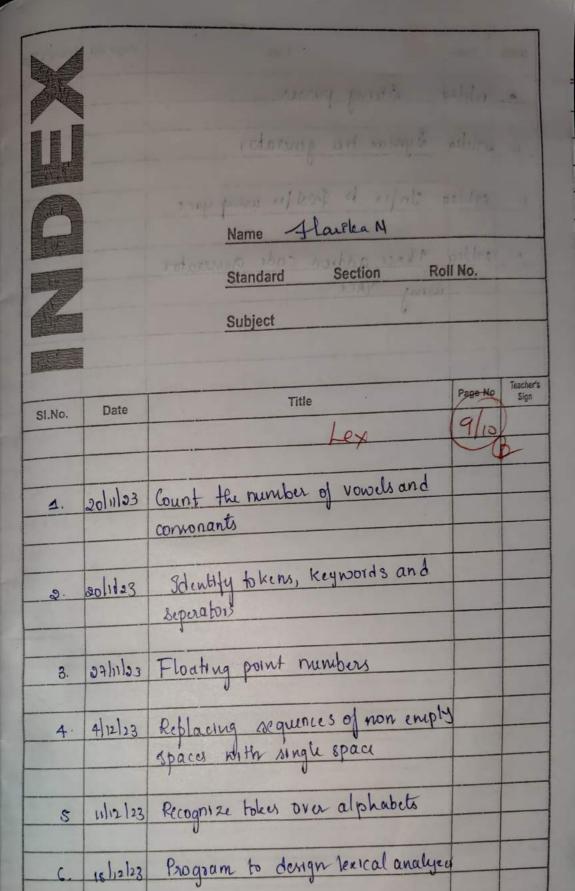
#### **CERTIFICATE**

This is to certify that the Lab work entitled "COMPILER DESIGN" carried out by HARIKA N (1BM21CS071), who is bonafide student of B. M. S. College of Engineering. It is in partial fulfillment for the award of Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belgaum during the year 2022-23. The Lab report has been approved as it satisfies the academic requirements in respect of Compiler Design Lab - (22CS5PCCPD) work prescribed for the said degree.

#### Prameetha Pai

Assistant Professor Department of CSE BMSCE, Bengaluru Dr. Jyothi S Nayak

Professor and Head Department of CSE BMSCE, Bengaluru



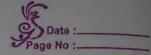
11/1/24 Recursive descent

8.

11/124 Derle calculator

S.No.	Date	Title	Page No	Teacher's
٩.	11/12	String parser		
10	29/1/24	Syntax tree generator		
(1	29/1/2	Infix to post 11x using yacc		
12	29/1/20	three address code generator		
		using NACC		
Crategic Cra	25,0224	alaT .	oh/2	->1536
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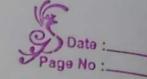




Write a lex program to identify each character
as consonant or vowel to agreen sentence
Tophon noyywrap
1.s
#encludex stdio.h>
7.3
·k·1.
alelilolul Al Eltlolu & printf ("vowel: 1.5/n", yytext):
[a-zAZ] Sprint[("consonant: 1.sln", yytext); }
1.1.
(OH) 3.
int main()
& Chine I go app tot
yylex();
seturn 0;
4 (bigy) orom 3/10
Output
o and v
lex prog2.l
cc lex-yy.c
. la out
Hari Lia vill
consonant: H
vowel:a
consonant: 1
40 wolft admod
wid read to a
The second secon

```
bmscecse@bmscecse-OptiPlex-5070:~/Documents/1BM21CS083$ lex p4.l
bmscecse@bmscecse-OptiPlex-5070:~/Documents/1BM21CS083$ gcc lex.vy.c
bmscecse@bmscecse-OptiPlex-5070:~/Documents/1BM21CS083$ ./a.out
abcdef
vowel:a
consonant:b
consonant:c
consonant:d
vowel:e
consonant:f
number of vowels 2
number of consonants 4
```

lex program to read the following input from a file and print the valid token on terimal odo wilsonda " option moyywrap 1.5 #Include estato his as Inglue long of la char framitions Intelfloat | char & print ( eggot, siegged set / best) ! int | [loat | char & print ("key words: vsin", yy text) 3 [0-9]\* Sprint("number: 1.sln", yytext); } [a-xA-z]\* Eprintf ("choracter: Y.5/n", yytext); ) 1.4.



void main ()	- Junton
\$	
print( "enter the file nome: ");	5 9 bond 121
Scan(("1.s", fname);	3 pp 232 03
yyin= fopin (fnome, ">");	Trientle Hear
941ex();	
fclos((yyın))	ELECTI
4	punde halayan
Output	de
lex prog 7.l	poids billy
ec. yytext cclex.yy.c	
·la.out	2056
	mireda bilali
enter the file name: to p. ext	
keywords: float	
number: 0978	
character: abc	

bmscecse@bmscecse-OptiPlex-	-5070:~/Documents/18M21CS083\$ gcc lex.yy.c -5070:~/Documents/18M21CS083\$ ./a.out	
output.txt		
MSCECSEMBMSCECSE-UDITPLEX-	5070:~/Documents/1BM21CS083S	
1 int a,b;		
- A TOO A SAME		

int Keywords a Identifiers, Seperatorb Identifiers; Seperator

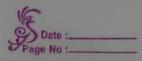
Lab Program Wrete a program en LEX to recognize Floating point Numbers. Check for all the following input Casus. #Includication h> month mand the uncool) maget of warp 1-1? [0-9] \*[][0-9]+ Eprenty ("Floating point number" ^[+-] ? [0-9]\* Eprintf ("Not a valid floating point number");} int yymrap () ent main () warm elifedestina potros yylex (); returnos Output [cx lab-prg 1.1 cc Lix.yy.c · la · out 99.0 Floating point number

+78.89

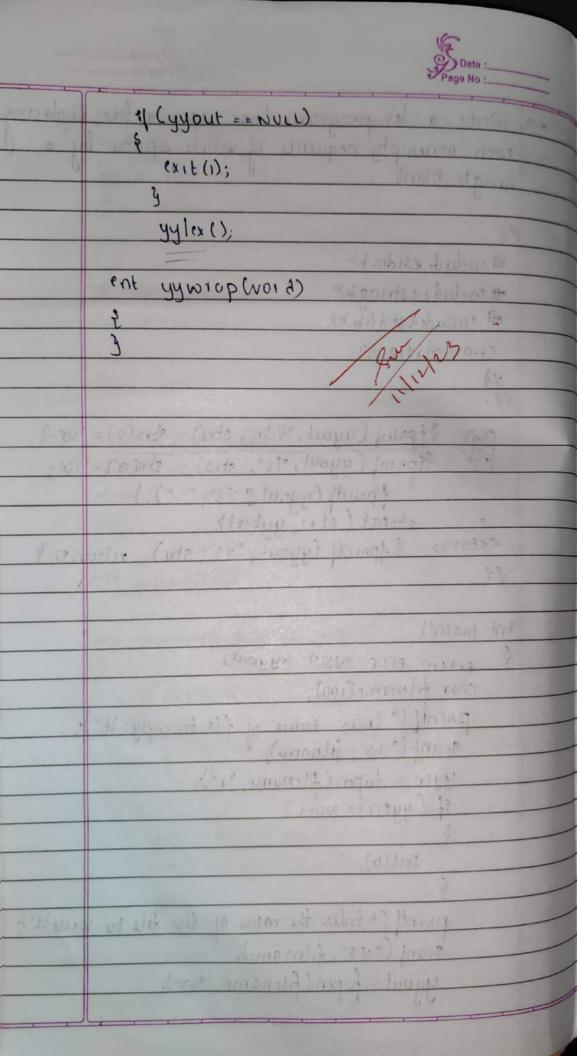
Floating point number

Floating point number

```
bmscecse@bmscecse-OptiPlex-5070:~/Documents/1BM21CS083$ lex float.l
bmscecse@bmscecse-OptiPlex-5070:~/Documents/1BM21CS083$ gcc lex.yy.c
bmscecse@bmscecse-OptiPlex-5070:~/Documents/1BM21CS083S ./a.out
enter any number 23.6
floating point numbers
45
not a floating point number
+6.3
floating point numbers
-55.66
floating point numbers
55.
not a floating point number
```

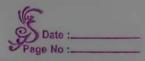


Write a lex program that copies a file, replacing each nonempty sequence of white spaces by a 18 #enclude estato.hy # include astring. wb # enclude estalib.h char str1[200]; Cin] & print (yyout, "/sln", strs); strs (0) = "10";3 CJ\* Efprin (yyout, els", strs); strico7 = 10'; fprintf (yyout " 1/s" " ");} streat (star, yytext); <<p>Exerty (yyout, "1.5", stri); return 0:3 1.1. ant main() extern FILE \*yyın, \*yyouts char filename [100]; prent (" Enter name of file to copy: It"); scan (" 1.5", filname); yyin = topen (filename, "r"); of (yyen == NULL) cust(o); pront (" Enter the name of the file to write It'); scanf (" 1.5", filename); yyout = fopen (filename, "w");

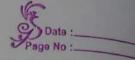


```
bmscecse@bmscecse-OptiPlex-5070; ~/Documents/1BM21CS...
 bmscecse@bmscecse-OptiPlex-5070:~/Documents/1BM21CS083$ cc lex.yy.c
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C50835 ./a.out
9000
success
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21CS083$ ./a.out
4005
success
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C50835 ./a.out
123
123fall
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21CS083$ lex re7.l
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083$ cc lex.yy.c
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ ./a.out
1234
success
bmscecse@bmscecse-OptiPlex-5070: -/Documents/1BM21CS083$ ./a.out
4511
fatt
omscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ lex blank.l
omscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ cc lex.yy.c
omscecse@bmscecse-OptiPlex-5070:-/Documents/iBM21C5083$ ./a.out
Enter the name of the file to copy:
                                        input.txt
                                        output.txt
Enter the name of the file to write:
mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$
```

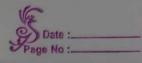




->	Write a lex program to recognize the following
	tokens over the alphabets &0,1,, 93
	a) the set of all string ending in DO.
	a) the set of all string ending in DO.
	1.1.
	rp-97*00 Eprint ("string accepted");3
	co-91 & sprint ( string rejected ) is
112 -	Julianto anoturo docturare terturana est
	1 Carried a
	int yywrapt)
	\$ Mary our hast Nava sprinds has to the
	3 Car bar Adolf mod
	int main ()
	int main ()
	yylex();
	3 1920 parce 1 jane 1 8 28 26 3 1 ( 26 4 )
	PAV 1
-	Output
	- Anglish
	lex string-ind-00.l
	ac hum.c
	la out best tiles must be and the
	40100
	String accepted
	34560
	String rejected



6)	set of all strings with thru consecutive asa's
	YP The stoletate of 110 undet
	1.1.
	To-97 222 To-97 & print ( string accipted );
	[0-9] 222 [0-9]* & print (" string accipted"); [0-9] & print (" string rejected");
	E-(children portes) Houng's Dorce of
c)	tive consecutive symbols contains at least the 35
	the consecutive number contains at least the 35
	5050
e)	schol all strings such that joth symbol
(e)	from right end is 1
	The state of the s
	Dalasa toe
	4 [0-9]
	() xs byp
- '	1.1.
	( { 6 d } ) * 1 { d } 6 9 3 2 prints (" string a celpted ") j
	4.1.
	dugduo
	Butput
	2.00.60 points 1021
	01234569891
	with symbol from right end 1p 1
	00106
	bitgoiso punte
	0.0248
	hotoget purset?



f)	set of all 4 digits who	sc sum 159	6
	elder the application	in puchanin at	Mar .
	1.1		
_	(0-9) Ssum= sum + atoly	ytext); wunt = cou	nt+1;3
14	1 = Sallarmon 9 = = D & & co	unt == A ) Ponent	(4yes) n");
-	8um=0: cô	junted=0;9 else	
and a	Jan Call No	oln"); sum=0; co	intede 0.3
0		6 1 '	
enlar	-44. 11 0 - 1mu 00		
	71. 17. 10	14	
	ent main()		
	\$	strtok	
	yylex();	2.980	
	return 0;	int)_ax 6 8 9	
	9	Secret	
	Output	int	
	0090	a day	16/24
		i	
	403		
	1233	March 19 18 19	
	Yes		
	100		
	1211	meter military	
	no	and the state of t	
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4.00
			1
	tout of the	Contract of the same	1-1-
	A Company of the Comp	811	1
			1

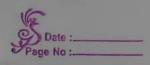
```
|bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ ./a.out
1111
successbmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ ./a.out
11
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ lex reS.l
bmscecse@bmscecse-OptlPlex-5070:-/Documents/1BM2ICS083$ cc lex.yy.c
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ ./a.out
1023002245
1023002245 10th symbol from right end id 1
^Z
                              ./a.out
[1]+ Stopped
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083$ lex re6.l
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21CS083$ cc lex.yy.c
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21CS083$ ./a.out
success
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ ./a.out
4005
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21CS083$ ./a.out
123
123fall
```

```
fall
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ lex blank.l
bmscecse@bmscecse-OptiPlex-5070:~/Documents/18M21CS083$ cc lex.yy.c bmscecse@bmscecse-OptiPlex-5070:~/Documents/18M21CS083$ ./a.out
Enter the name of the file to copy: input.txt
Enter the name of the file to write: output.txt
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083$ lex re1.l
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083$ cc lex.yy.c
                                                  input.txt
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ ./a.out
24988
24900 string ends with 00
2352
2352 string does not end with ee
47
[2]+ Stopped
                                         ./a.out
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ lex re2.l
bmscecse@bmscecse-OptlPlex-5070:-/Documents/18M21C5083$ cc lex.yy.c
bmscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083$ ./a.out
12142
12142 string does not have 222
24322245
24322245 string has 222
```

```
MSCCCSe@DMSCCCSe-OptlPlex-5070:~/Documents/18M21C50835 lex=re4.l
mscecse@bmscecse-OptiPlex-5070:-/Documents/18N21C5083$ cc lex.yy.c usr/bin/ld: /tmp/ccNpRHPT.o: in function 'yylex':
ex.yy.c:(.text+0x33f): undefined reference to
ollect2: error: ld returned 1 exit status
mscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083$ cc lex.yy.c -lm
mscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C50B3$ ./a.out
81
uccessbmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ cc lex.yy.c -lm
mscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083$ ./a.out
111
uccessbmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ ./a.out
mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ lex re5.l
mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ cc lex.yy.c
mscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083$
mscecse@bmscecse-OptlPlex-5070:-/Documents/1BM21CS083$ ./a.out
023002245
023002245 10th symbol from right end id 1
1]+ Stopped
                                ./a.out
mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ lex re6.l mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ cc lex.yy.c
mscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083S ./a.out
```

```
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ lex re7.l
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ gcc lex.yy.c
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ ./a.out
45612
2fail
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ ./a.out
1234
success
```

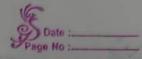




	Wrete a program to design Lexecal Analyzer in C/C++/Java/Python Language (to recognize any 5 keywords, iden Hijers, numbers, operators & punchation
	C(C++ / Java / Python Language ( to recognize any
	5 keywords, id th theres, numbers, operators & punduation
	#indude astdioih>
1	# include 1 string. W
	# include Lotype. hr
3	aley; who controdout out? ) Harg
	and levical Angluxer (char input-codecy)
	char * keynor ds[] = ?"[" "else, while, to, return"];
	char * opaa hois[] - \$"+" "-", "+", "1", "=" "= =" ""
	char * op a a hois[] = \$"+" "_ " (* " " " " " " " " " " " " " " " " "
	char *puncheations[]. {"," ";" "(", ")", "s", "3);
	chai *token = strtok (input_code, "Itin");
- (	nd + 3 (0 ex) 10" - (J. how Lugos rod)
1	while Choken 1 = NULL)?
	el (es digit (boken (OJ)) to
	printil "Number: 13/h", token);
	2
	else of (realpha (token [0])    token [0]==(-)
	\$ tuntur
	Int 15 Keyword=0;
	for (int 1=0; ex sized (keywords) /sized (keywo
	( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (
	of (stremploken, keywords [i]==0)&
	2 x ctanga a nortours
	print ("Keyword: 1.510", token)
	iskeyword = 1504 mil mg
	breqt; miles brown
	4 K nifilmb P
	3 : who is go to day on 9



print (" 9dentifrer: 1's/n", token); else 1 ( strch ("+-\*/=<>; (), ", to ken to)! = NOW) printf ("Punchation operator: Y.sln", token); tokin = strtok ( NULL, "Ith"); 2 . Clerento whough reds ant main () & logned stands a good of sono char enput\_code[]= " ef (x>0) & return x; } elle Eretuin -x; y"; lexical Analyzer (in put codi); return o; Output Keyword : 1 Punchuation operator: ( g den Hfier: x Punctuation loperator:> Number: 0 Punchation Operator:) Keyword : return Jdentifier: x Punctuation Operator:;



	Keyword: else Keyword: seturn
	Keyword: seturn
	Punchation Operator:
	adiable: x
	Punchiation Operator:
	" La dalla a shada is the
1	Lagor frank rods
(w)	2 · bor dos
8/12	(b) friggs 10.15) 13/10/0 1/10/0
(0)	(6) 733912 33322 4
	(hilling x3 == (hra] tugas) ja
	3
	,7-600
	,S
	3
	: ()A 1:00
	()6 6704
	3
	- ((s)) intora
	NO A
	(16) determ
	()A-6100
	3
	Come of the part of
	Property of the State of the St
	1(01) Johnson
	('d') Watson

÷

```
enter c code
int a = 1234;
Keyword: int
Identifier: a
Punctuation/Operator: =
Number: 1234
Punctuation/Operator: ;
```

Page No :\_

parsing on the following grammar  $s \rightarrow c Ad$ ,  $A \rightarrow abla$ #enclude estations -# enclude «stdleb. h> cha, input [100]; ent- end=0; word match (char expected) ef (input [ind] = expected) end ++, NOOL A(); NOED SC) match ('c'); A (); match ('d'); vord A() e Comput [ind] = = (a) paraty ("Helloln");
match ('a');
match ('b');



	Torelsing of remaining distance of more are
1	csl a - a gamed poravide adsorbing
Ī	printf C'Parsing failed. In', end);
Ī	exit( 1);
Ĭ	West & danged in
	1) a) topic 3 France broad V
	ent maini) & 1112
	parent f ( renter the enput string, \n');
Ī	scanf ("1.5", input);
	D. 19950
	5();
Ī	et (subntzeug) == , d.) {
Ì	prent ("Parseng nuccessful to")
	3
	else more model
	§ 1-1-4-1 = 1 [s] Y
Ĭ	print ( Parsing failed. Extra characters
	found, In");
	3 'at dance Va
	returno;
	3
-	House ( a/admorges bylow) Hurself 3 18923
	piper autor it de Soit to
	Outout:
	\$ 10\$-0P = \$P\$ M-131
	Enter a string to parse; cold
	Enter a string to parse: cold Passing successful Input follows the grammas.
	V A: EX X 42 - 17- 9 2 3 4
	1000 2300 630 833
	Partie 148 Maria
	4.4

```
ecursive descent.c: In function 'A':
recursive descent.c:33:16: warning: too many arguments for format [-Wformat-extra-args]
              printf("Parsing failed.\n", ind);
mscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/DocumentsS ^C
mscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/Documents$ ^C
mscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/Documents$ gcc -o recursive descent recursive descent.c
ecursive descent.c: In function 'A':
ecursive_descent.c:33:16: warning: too many arguments for format [-Wformat-extra-args]
  33 |
               printf("Parsing failed.\n", ind):
                      A .....
mscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/DocumentsS./recursive descent
nter the input string:
ad
ello
arsing failed. Extra characters found.
mscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/Documents ./recursive descent
nter the input string:
aaad
ello
arsing failed. Extra characters found.
mscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC: //Documents$ ./recursive descent
nter the input string:
abs
ello
arsing successful.
mscecse@bmscecse-HP-Flite-Tower-600-G9-Desktop-PC:-/Documents$ ./recursive descent
nter the input string:
aadS
ello
arsing failed. Extra characters found.
mscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/Pocuments$ ./recursive descent
nter the input string:
abdS
ello
arsing successful.
mscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/Documents$ ./recursive descent
nter the input string:
aaadS
ello
arsing failed. Extra characters found.
mscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:~/Documents$
```

String match and where nrs weekt\_string-matching.l # anclude ( std10. h) # include estallb-by # include "y. tab.h" extern int yylval; 1.4 [aA] Syylval = yytext[0]; return A; 3 (bB) Egylval = gybrat (o); return B; 3? Sichin NL: 3 de o otas o Homan Exchuse yytextro); 3 () Y. J. int yywrap () return 1; sitenide belovat +) Homes week7. string-matching. 4 # 12etude estdio. W Findude 1std lib. W ant yyerror ( char xs); int gylax (void); and Flores he 1. token A 1. token B

Y. token NL



	1.1. som with were adore until
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	S 5 A rader & Coltadora louiso 2 1223
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	yypani(); felonomia midse
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	Int yyerror (chan *s)
	E in and it
	paint ( "Invalid String! In");
	schuin 0;
	y total show question for sea
	31
	Output
_	Ed Sil holy which will be
	ba week7-string matching.
	Jacc -d weekt string matching y
	gcc lex.yy.c y.tab.c
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Just resident A



	Pago No :
enter a string	)!
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parsed using	the rule (ann)b, nx=5.
valid String!	
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aabbb	
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mscecse@bmscecse-OptiPlex-5070:~/Documents/18M21C5083$ yacc -d anbn.y
mscecse@bmscecse-OptiPlex-5070:~/Documents/1BM21C5083$ gcc lex.yy.c y.tab.c
mscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21CS083$ ./a.out
inter a string!
abbs
nvalid String!
mscecse@bmscecse-OptiPlex-5070:~/Documents/18M21C5083$ ./a.out
inter a string!
abb
nvalid String!
mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ ./a.out
nter a string!
aaab
nvalid String!
mscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21CS083$ ./a.out
nter a string!
aaaab
```

arsed using the rule (a^n)b, n>=5.

mscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21CS083\$

alid String! aaaaaabb

nvalid String!



	-50.10
->	Design a multable grammas for evaluation of
	arithmetic expression having +, -, *, 1, 1, 1
	operators
	(13472)
	1 highest & right
	y becond higgest & right left
	*,1 " " & left 1 10000 101
	+, -5 least & life
	Scort ("1st input)
	proo1.4
	100
	1. 2 3(1) == (bastlugar) 13
1	# enduded std10.ht
	1.3
	1. token nom
	1. left= (+1 (-)
refere	1. left 1+1211 porces of of House
	1. let 4.1.1 hard have
	Y. right 'n'
	Y.Y. October
	expr: e Eprant ("Valid expression (n"); perent ("Result"
	1d/nº, \$\$ ); returno; y
	e: 1'+'e \$\$\$ = \$1+\$3;3
	10'-10 795 = 91-43;3
D. Carrie	1'e*'e & 44 = \$1 + \$3, 3
man artificat	1 e'/'e & 1 9 \$1/43,3
	12 1/1e 848 = 91 /. 13:3
	1 NUM 8 6 1 - 4'1. 4
	1 NUM & p\$ = \$1; 9
	1.1.



ent marn!) parnt (" In Enter an arthmetic expression "); pryyparse (), retuin 0; int yyerrore) print ("In Invalid expression In"); return o; p2001.1 1. option royymap #include "y. tab.h" 1.4 4.7. (0-9)+ &yylval = a tor (yytext); return Nom; 3 :[+13 in return o; return yytextrol; 4.1. Julput: Lex proos.1 gcc lex.yy.c y.ta b.c · la · out



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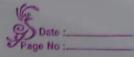
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bmscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC: /Documents vacc -d prool.v
bnscecse@bnscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/DecumentsS gcc lex.vv.c v.tab.c
y.tab.c: In function 'yyparse':
v.tab.c:1022:16: warning: implicit declaration of function 'vylex' [-Wimplicit-function-declaration]
1022
            yychar = yylex ();
y.tab.c:1205:7: warning: implicit declaration of function 'yyerror'; did you mean 'yyerrok'? [-Wimplicit-function-declaration]
1205
            yyerror (YY_("syntax error"));
bmscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC: //Documentis ./a.out
Enter an arithmetic expression
5+6
Valid expression
Result : 11
bmscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/Documents ./a.out
Enter an arithmetic expression
5*6-2
Valid expression
Result : 28
bmscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC: //Documents5 ./a.out
```

Enter an arithmetic expression

bmscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/Documenti\$

Invalid expression

5-6+\*



	✓ Page No:
-	Write a Yacc program to generale syntax tree for a geven arethmetic expression.
	a given arethmetic expression.
	p1.y
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solve	18. 1 (but) Horacope (517) with and 3 stock !
	# Enclude &math. We book of - 10
	Henclude x ctype. ht
	# anclude & std10.h/
	Hendude estalib. ht
	#coclude & string. h>
	0 = 677.7
	shuck tree-node assess no islas of printing
	& Charage S
	char valcion; manufar
	ent rc;
	Š;
	1) within 100
	ent end;
	struct hee_node syn_tree [100];
	void my-print-her Cent cur_ind);
	ent mknode (int le int re, char val(10))
	1.4 (Loralor roots or lat of lord about the las
	L'other digit
	1.1. 1) - Stalball and and
	Sie & my-parnt-tree (\$1),3
	;
	11- KB3 and 12
	E: E'+++ \$\$\$ = mknode (\$1,\$3, "+"); i}
	17 8 \$4-\$1:3
	3



T: + '+' F & \$ 1 = mknode (\$1, 43, 4+"); ,4 2\$\$=\$1;3 1F F: '('E) ) \$\$\$ = \$2;3 I digit schar buf [10]; sprint (buf, "1.d" yylval \$ = mknode (-1,-1, but): } the separate of the same 1.4. to other shulson me Agridalbas + sturmen int main () Kalpande , bylance by end = 0; printf (" Enter an expression (nº); and I and sypaniel); return os ent yyerror () printf ('NITW Exxor(n"); Charge In Doed ting - um bear stronger and as for as socialing the ent mknode (int le, ent re, char vallro]) stropy (syn\_tree [int], val, val); syn\_tree (ind) te = le; syn\_tree (Md). nc= xc; large mas end ++; 3 (turn und -1;



void my-print-tree Cint cur-end) ef (cur-end == -1) return; ef (syn-tree [cur= and]. lc = = -1 && syn-tree [cur-Ind]. 1(==-1) paint (" Deget Node -> Index: Y.d. Value: yeslo" Hoursand, syn-tree [wind]. val) printf ( Operator Node -> Index : 1.d, Value: 1.s. kelt Child Jodex: 1d, Right Child Joden: 1d In", curr\_ind, syn\_til Eur-end]. val, syn-tree [air-ind], lc, syn-tree [air-ind]. my-print hee (syn-tree Cur-ind).(c); my-paint-tree (syn-tree [cur\_ind]. 10); 4,2 #enclude "y.tab.h" eatern ent gylval; 1. 4 4:1. Co-9)+ & yylval = atoi (yytext); return digit; 3 CHT: Capo return o, return yytex [o]; ent yyrorapu

	Page No:
	Output
	an expression
	8+4
· n.Chn	Then must bust to
	Operator Mode -> Joden d, valle it, left (hill
073	Right Child Indix: 1
	and the same of th
	Digit Node -> Index:0, Value:2
- 63.7	Digit Node -> India: 1. Valu: 4
Al roke	Character base base and all
1/31	Superference of the superference
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	Alpih with classyy) role = lovelyy & +(p.d)
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	soloty and
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	Y Y

```
bmscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/Documents$ ./a.out
Enter an expression
4+6*9
Operator Node -> Index : 4, Value : +, Left Child Index : 0, Right Child Index : 3
```

bmscecse@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:-/Documents\$

Digit Node -> Index : 0, Value : 4

Operator Node -> Index : 3, Value : \*, Left Child Index : 1, Right Child Index : 2 Digit Node -> Index : 1. Value : 6

Digit Node -> Index : 2, Value : 9

Weeks - yacc - Jofix To Postfix 9

1. \$ #anchide xstdio. hb

# include estalib.he

# Include "y-tab.h" extern ent yylval;

1.4

1.1.

Egylval = atoi (yytext); return num, } [0-9]+

CIt]:

Ereturn 0;5 10 Ereturn gytrat (0);3

1.1.

ent ywarap()

weeks-yaac Infix To Postiny

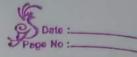
4. 5 # Enclude / tdio. W

# encluder std lib. by

ent yyerror (const char \*s); int yylex (void );

SDate :\_ Page No :\_

	Page No :
7.	18 47 /2 11 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Maria
1. token num	
1.11 L.) L. 1 M. Mart James	in you with
7 left (x) (1)	7
1. (eft ')	and foreign
y lift '('	i man
y. right 'A'	
111	
11	thistory.
sie Eprint ("In");3	
	rujes no esar
e: ( '+'t {print  ("+');]	34886
6: c	4 4 7 7 7
le :- t & print ( "-1); 3	
l t	
+: +: + x'h {print ("x"); 3	C xilos cao retira
) ( ) ^	ANS BEREE
	NUMP 1 2 x 3 0 8
;	
h: f'x' h & print (" ^ ); ]	
14	
j	
f: '(' e ')'	
I num Eprint ("1 d', \$1); 4	
)	
1.1. 5	
Void main ()	
2	



prent (« Enter an infix expression: \n);
yy parse (); ent yyerror (const char xs)

ent ("Invalid infix epression! (n"); O utput: (1/2/2) Janay 3 108 Enter an enfix expression: 8 (1. 0) | hopen 3 1 1 1 3 1 398\* + Enter an infix expression 398 \*5 /+ Invalid infix expression! [der) flored & A X ford (1 ) 1) 17 A. Cit "6 v") / large vour 1 Origina blow

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bmscecse@bmscecse-OptiPlex-5070:-/Documents/18MZ1C5083$ Lex InTIX_to_postrix.t
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ yacc -d infix to postfix
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083$ gcc lex.yy.c y.tab.c
bmscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ ./a.out
Enter an infix expression:
2+4*5
245*+
bmscecse@bmscecse-OptiPlex-5070:~/Documents/1BM21C5083$ ./a.out
```

Enter an infix expression:

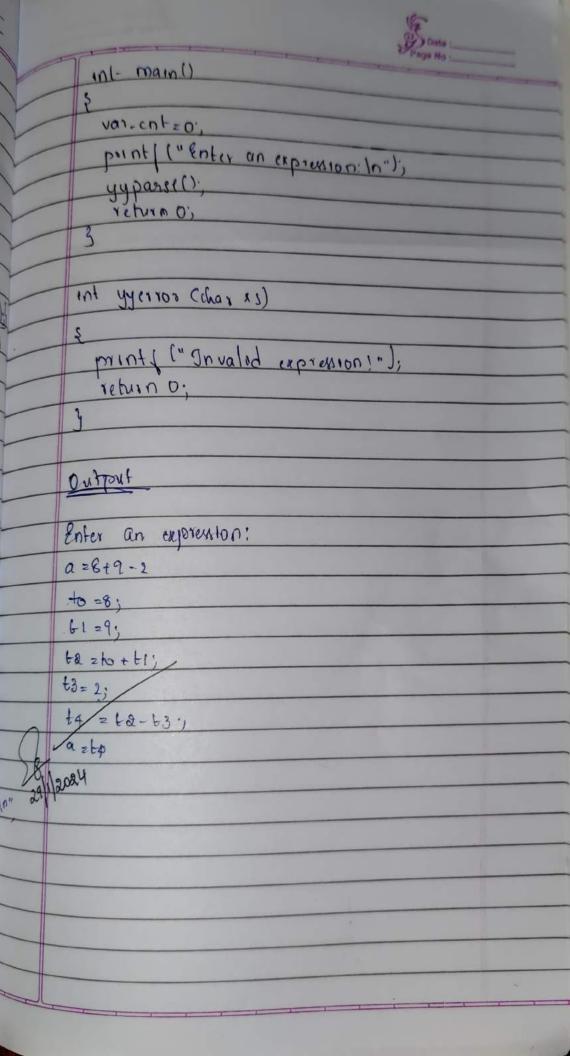
3+6\*2-1/3 362\*+13/-

Date :\_\_\_\_\_

weeks Add esslade. #Enclude 15td10. ht # fachade (stdlib-h> utun ent yylval; extern char Eden (20); d [0-9]+ a [a-2 A-2]+ 1.1. Egylval = ator (yytext); return digit; } 843 & stropy (iden, ytert); yylval=1; return id;) Say [11] return 0; 10 return yytextcols int yywrop() return 1; 1.5 #include < math. ht # Include & etype by # include < stdio. h.



	ent yy error (char +s);
	int rules (word);
	int vox-cnt=0,
	char iden[20];
	Y
	V. token id
	y token digit
	y.y
	sid '= Eprint (1/s = t/d/n' iden vor ent-)
	L. E '+'T Std = var_cot var_cot point
	= +1d + +1d; 10", \$\$ ,\$1,131;}
	1 E'-'T & \$ \$ = var-ont'
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	\$;
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arr	1 T'/F & " = -" = 1-"
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	; started we mounded
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	F: P'NF 2" - " - N = );
	1P { 14 = 113
	· c arujor
	p: '(' E ')' ( \$ 4 = \$ 2; }
	I digit & \$ = voi _ cnt; yar_cnt ++ ; print( "trd=1d: )
	\$\$,\$1);3
	;
	1/.). Addon's shall so the
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	La git to a stallong th



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mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21C5083S lex 3addcode.l
mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ yacc -d 3addcode.y
mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ gcc lex.yy.c y.tab.c
mscecse@bmscecse-OptiPlex-5070:-/Documents/1BM21C5083$ ./a.out
nter an expression:
=8+9-2
0 = 8:
1 = 9:
2 = t0 + t1;
3 = 2;
4 = t2 - t3:
=t4
mscecse@bmscecse-OptiPlex-5070:-/Documents/18M21CS083$ ./a.out
nter an expression:
=2^3/23+5
9 = 2;
1 = 3:
2 = t0 ^ t1:
3 = 23;
1 = t2 / t3:
5 = 5;
5 = t4 + t5:
```

:t6