

## LABORATORY WORK BOOK

Nar	ne of the	Student Bacherla S	anthos	1.450	40	N	gili	al	TOT	119.	md	3		
Class IT-B Semester 03							Roll Number							
			Name DS laboratory			2	3	9	5 1	A	1 2	G	3	
Nar	ne of the	Course Faculty Ms. K. L	axmini	vuyanta	mmå				Facult					
Exe	rcise Nu	mber :0.5	Weel	k Number :	OS				Date	01	10 2	02	4	
	Exercise Number	EXERCISE NAME		S AWARDED										
S. No.			Aim/ Preparation	Algorithm / Procedure		Source Code Calculations and Graphs		-	Program Execution Results and Error Analysis		Viva - Voce	N	Total	
				Performano										
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1	5.1	Implementation of Stack		3 900	o Scan	Jil.	Ù,	di	بأمار	4	ogn	1		
2	5.2	Balanced parenthesis Checking		e K	o 50	til	XI s	01	LOC.	t	100	0		
3	5.3	Evaluation of PF Expression					1	١.	Stor	¢.	al.			
4	5.4	Infia to post fix		1			15)			•	1.97			
5	5.5	Reverse A Stack	Shimb	) mon	010		aut	7	W	ant				
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Signature of the Student

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5. Stack.
5.1 Implementation of Stack:
     AIM: - Woute a Program On Emplementation
      of Stack.
     PROGRAM: -
      Import java. util. Scanner;
                                     5.1 Ingirma latin of Street !
     import Sava. util. Stock;
      -lass Stack 1
       Public Static void main (String augs[]) {
         Stack < Integer > Stack = new Stack <>();
         Scanner bk = new Scanner (System. in),
         While (true) of
           System. out. println ("1. push");
           System. out. println ("2. pop").
           System. out. println ("3. Peek").
          System. out. println ("4. Check of Empty");
```

```
System. out. println ("5. size");
   System. out, pountly ("6. Exit.).
  System. out. printly ("Enter your choice");
   int G = bk . nextInt() :
   Switch (i) [ steek in Employed to the printly (i) haring
                                           Moord
      <ance 1:
        System. out. print (" Enter element to push;").
int c = bk. nextInt();
Stack. push (e);
        System. out. println (e+" pushed to Stack").
 seld . Horeak : " os ? Z Moote") altaing a due
                                         1 30570
    case 2:
        if (! Stack. is Empty (1) f.
           int pE = Btack. pop(); ()
          System. out. println (PE + " Popped from Stack");
 Opstern out. printh ("Involid choice...two motors
      System. out. pountly (" Stack is Emply").
   break ;
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System out, printly ("5 size")
case 3:
 if (! Stack. in Empty (1) of
   System. out. println (" Top element: " + stock, pecke)).
 i else f
                      hit c = bk · nexbotto .
   System. out. println ("Stack is Empty");
break;
System out. print (" Enten element to the
  System. out. println ("Is Stack Empty?"+ Stack is
  break;
                     Empty();
case 5: holas "+ 5) althing two mit
  System.out. println (" Stack Size: "+ Stack. Sizec))
  break;
case 6:
  System. out. println ("Exting").
  bk. close(); () gog ...
  return: 1 39) alting too motive
defailt:
  System. out. printin ("Invalid choice...try again").
  exporem. out, pruntlen (" sistem is tempty")
                                        · Nosto
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RESULT: -

INPUT: 1. Push . OUTPUT: Enter Element 70

Push: 7 3. Peek

4. Check if Empty 7. pusheol to Stack.

Shing & = bk. nextline():

1 328

5. Size

6. Exit ("odo ") ming to metal

Enter your Choice: 1

Balanced Parenthesis Checking: -

AIM: - Given an Expression String, Write a

JAVA Program to find whether a given

Othing has balanced parenthesis or not.

PROGRAM: -

Import ina. util. \* wigner al. Mother of

class Bp {

Public Static void main (String [ ] augs) {

Scanner bk = new Scanner (System.in);

Yeturn Fake:

took, is Emply (); 33

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- ! TJUESHT!
   String g = bk. next line ();
  boolean in Bolanceol = of Bp (g));
   if ( is Balanced) of
                           N389 €
System. out. prin-lln ("True");
   y else 1
                           5: 5120
    System. out. println ("False");
                  Enter your chaice: 1
 Public State boolean GBP (String 9)
  Stack <> Stack = Jew Stack <7 ();
 for (chan ch: g. to Chan Array (1)
   if o (ch = 0= 101) by both of margines. AVAD
 . Stack. Push (ch);
   3 else if (=h ==()) {
                         Konkam:
     if ( stock . is Empty ()) &
        return False;
                            - 98 casts
    Stock pop ();
  Scanner bk = new Scanner (System. Pr.)?
Yeturn Stack. is Empty (); 33
```

RESULT : -

INPUT: - " { (a+b)\* [c-d) } " = 3 dov 300

OUTPUT: - False

5.3 Evaluation Of Postfix Expression:

AIM: - Given a Postfise Expression, Write a

Purguam that the given task is evaluate the

it wold a stack pape);

Postfix Expression.

PROGRAM: - (1 lov / slov) roug . Masses

import java. util . \*;

class Postfix (

Otatie int Epf (string exp) ?

Stock = Integer > Stock = new Stock = 7 (7)

for ( int i=0; i < exp. length e); i++) {

chan c = exp. Chan At (i);

if (character. Is Digit (G)) {

Stock. push (G-'0'); }

else 1

```
- : TJUEBY
   int val 1 = Stack . pop();
  int vals = stack. pop(); = 1 * (d+1) } - : TUCK
                                salo- - ; rugtill
  Switch (6) {
    case '+':
     Stack: push (val 2 + val 1);
      break; no moving -: MIF
    case (_)
Stack. puch (val 2 - val 1)
     byeck ;
                         Postfix Expression.
 care '/':
                                 PROOFFAM :-
       Stack. push ( val2 / val 1).
      break;
    case · * '.
       Stack. push ( val 2 * val 1);
      break ;
   Stark a Integer > Stark John Stock 67 [] &
     for ( int i=0, i < exp. length () = 1+1) x
Yelturn Stack. Pop (1;
Public Static void main (String augs[1) !
   Scanner bk = new Scanner (System.in):
                     8/16
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System. out. print ("Enter a postfix Expression").
     String exp = bk · nextline(1;
     System. out. printly ("post fix e valuation: "+ Ept (exp));
                                  relieve 3 c
3
RESULT: -
ENPUT: Sty = "100 200 + 2/5 * 7 +"
OUTPUT: 757 : (9x3 minds) its possess silvess
Infix To Postfix Expression Conversion: -
AIM: - Write a Program to Convert a given
Infix Expression into Postfix Expression.
                 f (Character intesten or Digit
                          result. append (6):
import Java. util . *;
class Itp (
                      Stack, push (34, 15)
 Otatic int IP ( chan ch) (
   Switch (ch) {
wille (! should . in Employed) . "+ " sass ! est
     return 1;
                         bugge . thus.
```

```
Setem out print ("Enten a porting in some
                 Shing exp = bk opextline(),
       return 2;
              Bystem : out . printh (" post fix e valuation
Cose , Y,
       return 3;
                                          RESULT: -
    return -1;
               "4 + * 2/2 + 002 001" = 18 : TUGNE
  Static Ostring 9$p (String exp) {
                                  OUTPUT: 757
     String Builder Verult = New String Builder (1)
    Stack < character > Stack = new Stack < >();
   for lint i=0; iz exp. length(); i++) {
        chan c = exp. CharAt(i);
     if (Character. inletter or Digit (G))
        Yesult. append (G);
                               import Java: all 1 "
     else if (c = = (c))
                                       Just Itp (
        Stack. push (6);
     else if (c=')) (1 (As made) 91 this stoods
                                  Switch (cm) (
        while (! Stock. is Empty) 24 Stock. peck()!
          Vesult. append (Stack. Pop ()):
```

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Stack . pop ();
                         Revouse A Stack: -
 I else 1
 While (! Stock. is Empty () && Ip (0) == Ip
          ( Stack , peek()) {
                                 PROGRAM : -
    3
                                class Revenue ?
Stack · push (c);
Static void IS ( Stock & Integer > Stock, Int item) { [ [
While (! Stack . "us Empty(1) {
   Verult. append (Stack. Pop ());
return result. to string ()
3
                         IB (Stock item).
Public Static void main (String angs []).
  Scanner Sc = new Scanner (System. in);
   Sturng exp = s. next that ();
  Oystem. out. println ("Ip (exp));
                  int top = Brown : pop();
RESULT: - INPUT: A+B*G+D OUTPUT: ABC*+D+
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3 tack . pap ( ) .
Reverse A Stack: -
AIM: - Woute a Program On Reversing a Stack.
                  ( Stack . PECK() 1
PROGRAM : -
import iava. util. * ( ( ) qoq . Note ) broggo . theor
class Reverse 1
                               chock . bash (c).
 Static void IB (Stack & Integer > Stack, int item) {
   if ( Stack. is Empty ()) {
    Stack. push (item);
                Tesult. append (Stark. Popl)
    vetum;
    top = Stack. popcj; mide of these males
  IB (Stock, item);
 Stack: push (top);
3
                   danser se = you soon
    er (System in).
Static void Rs (Stack > Integer 7 Stack)
  if (Stack. is Empty())
    return:
 int top = Stack. pop();
  Rs (Stack).
            PESULT! - INPUT: A+B'C+D OUTPUT!
 IB ( Stack . top);
```

```
Public Static vois main (String[] augs) {
  Scanner Sc = new Scanner (System. in);
  Stock = Integer > Stock = new Stock & a);
  System. out. print (" Enter Bize of Stack: ");
  int n = sa. next Int()
  System. out. println (" Enter Elements: ");
  for (int i=0; i<n; i++)
  Stack. push (sc. nextIn+());
  Rs (Stack).
  System. out. printly Ta Reversal Stack;"+
          Stack)
             belivern Operands like "A+B".
RESULT: -
INPUT: Elements = [1, 2, 3, 4, 5]
OUTPUT: Original Stack Stack After Reversing
AND MANY bollow " O mate of motter " ob tolly
motted 2 to the telement of bedten at
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VIVA VOCE : -

- 1) What is a Stack?
- A) A Stack is a linear data Structure that Stores items in a last-In / First-Out (LIFO) or First-In/ last-Out (FILO) manner. In Stack, a new element is added at one end and an element is removed from that end only. The Insert & Delete. Operations are often Galled Push and Pop.
- 2) What are Infix and Postfix Expressions?
- 4) Infix Expression: Where the Operator is placed between Operands like " A + B".

Postfix Expression: - Whow the Operator is placed ofter the operands. Like "AB+".

- 3) What do "Bottom Insertion ()" Method Work as ?

  A) This Method Annual the Method Work as ?
- 4) This Method Append Element at the bottom

4)

of the Stack and Bottom Inscrition accept two Values as an argument first is Stock and the Decord is elements, this is a recursive method. How do "Reverse ()" Method Will Work? The Method is reverse elements of the Stack, this method accept Stock as an argument Reverse() is also a Recursive () function. Reversel) is involved Bottom Inscrition () nethod for completing the Yeverse operation on the Stack.

Low