COMPILER DESIGN LAB (CSL5404)

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Program: B.Tech CSE
(5th Sem JUL-DEC 2021)

Assignment - 8

Name : Lakhan Kumawat Roll No : 1906055 Course : CSL5404

Question 1:

Every compiler has intermediate code representation phase.
Given the set of expression: a+b+c*d/e+f .
Write a C program that can find the quadruples
of the given expression for intermediate code representation.

> Program Code

```
#include<stdio.h>
#include<string.h>
#define MAX_LIMIT 20
int main()
{
  char line[20];   int s[20];   int t = 1;
  int i = 0;
  printf ("Enter string..  :");
  fgets(line, MAX_LIMIT, stdin);
  for (i = 0; i < 20; i++)
  s[i] = 0;
  printf ("op\ta1\ta2\tres\n");
  for (i = 2; line[i] != '\0'; i++)
    {
      if (line[i] == '/' || line[i] == '*')
    {
      printf ("\n");
      if (s[i] == 0)
        {
          if (s[i + 1] == 0)
        {
          printf (":=\t%c\t\t t%d\n", line[i + 1], t);
           s[i + 1] = t++;
        }
          printf ("%c\t", line[i]);
        (s[i - 1] == 0) ? printf ("%c\t", line[i - 1]) : printf
("t%d\t", s[i - 1]);
```

```
          printf ("t%d \t t%d", s[i + 1], t);
           s[i - 1] = s[i + 1] = t++;
            s[i] = 1;
        }
    }
    }
  for (i = 2; line[i] != '\0'; i++)
    {
      if (line[i] == '+' || line[i] == '-')
    {
      printf ("\n");
      if (s[i] == 0)
        {
          if (s[i + 1] == 0)
        {
          printf (":=\t%c\t\t t%d\n", line[i + 1], t);
           s[i + 1] = t++;
        }
          printf ("%c\t", line[i]);
             (s[i - 1] == 0) ? printf ("%c\t",line[i - 1]) :
printf ("t%d\t",s[i - 1]);
          printf("t%d \t t%d", s[i + 1], t);
            s[i - 1] = s[i + 1] = t++;
               s[i] = 1;
        }
    }
    }
  printf("\n:=\tt%d\t\t%c", t - 1, line[0]);   getc(stdin);
  return 0;
}
```

Output screenshot:

```
F:\Compiler Design\Lab\LakhanKumawat>"f:\Compiler Design\Lab\LakhanKumawat\min.exe"
Enter string..  :a+b+c*d/e+f
op      a1      a2      res

:=      d               t1
*       c       t1      t2
:=      e               t3
/       t2      t3      t4
+       b       t2      t5
:=      f               t6
+       t4      t6      t7
:=      t7              a
```

Question 2:

Write a program in C to find three address code using triples for the following set of input expression:
a = b*-c + b*-c

> Program Code

```
#include <stdio.h>
int main()
{
    printf("\nGiven Expression is like:- a = b * -c + b * -
c\n");
    printf("\nEnter values of b, c (space separated): ");
    int b, c;
    scanf("%d %d", &b, &c);
    printf("Note: 'u_minus' operator used for making negative
of the operand\n");
    int arr[6];
    printf("\n#\tOperand  \tArgument-1\tArgument-2\n");
    for (int i = 0; i < 6; i++)
    {
        switch (i)
```

```
        {
        case 0:
            printf("(%d)\tu_minus \t c=%d\n", i, c);
            arr[i] = 0 - c;
            break;
        case 1:
            printf("(%d)\t *\t\t (%d) \t \t b=%d\n", i, i - 1,
b);
            arr[i] = arr[0] * b;
            break;
        case 2:
            printf("(%d)\tu_minus \t c=%d\n", i, c);
            arr[i] = 0 - c;
            break;
        case 3:
            printf("(%d)\t *\t\t (%d) \t b=%d\n", i, i - 1, b);
            arr[i] = arr[0] * b;
            break;
        case 4:
            printf("(%d)\t +\t\t (1) \t  \t (3)\n", i);
            arr[i] = arr[1] + arr[3];
            break;
        case 5:
            printf("(%d)\t =\t\t a \t\t (4)\n", i);
            arr[i] = arr[i - 1];
            break;
        }
    }
    printf("\nAnswer of this expression on given input :-
%d\n\n", arr[5]);
    return 0;
}
```

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Output Screenshot:

```
F:\Compiler Design\Lab\LakhanKumawat>"f:\Compiler Design\Lab\LakhanKumawat\min.exe"

Given Expression is like:- a = b * -c + b * -c

Enter values of b, c (space separated): 5 8
Note: 'u_minus' operator used for making negative of the operand

#       Operand         Argument-1      Argument-2
(0)     u_minus          c=8
(1)      *               (0)             b=5
(2)     u_minus          c=8
(3)      *               (2)     b=5
(4)      +               (1)             (3)
(5)      =               a               (4)

Answer of this expression on given input :- -80


F:\Compiler Design\Lab\LakhanKumawat>
```

End Of Assignment
