18CSC304J/ Compiler Design

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Exp-11: Intermediate code generation – Quadruple, Triple, Indirect triple

Aim:- To write code for Intermediate code generation – Quadruple, Triple, Indirect triple

Codes:-

```
#include<stdio.h>
#include<ctype.h>
#include<stdlib.h>
#include<string.h>

void small();
void dove(int i);
int p[5]={0,1,2,3,4},c=1,i,k,l,m,pi;
char sw[5]={'=','-','+','/','*'},j[20],a[5],b[5],ch[2];

void main()
{
   printf("Enter the expression:");
   scanf("%s",j);
   printf("\tThe Intermediate code is:\n");
   small();
}

void dove(int i)
{
   a[0]=b[0]='\0';
   if(!isdigit(j[i+2])&&!isdigit(j[i-2]))
   {
      a[0]=j[i-1];
      b[0]=j[i+1];
   }
   if(isdigit(j[i+2]))
   {
      a[0]=j[i-1];
      b[0]='t';
      b[1]=j[i+2];
   }
   if(isdigit(j[i-2]))
   {
      b[0]=j[i+1];
      a[0]='t';
      a[1]=j[i-2];
      b[1]='\0';
   }
   if(isdigit(j[i+2]) &&isdigit(j[i-2]))
```

```
    {
       a[0]='t';
       b[0]='t';
       a[1]=j[i-2];
       b[1]=j[i+2];
       sprintf(ch,"%d",c);
       j[i+2]=j[i-2]=ch[0];
    }
    if(j[i]=='*')
       printf("\tt%d=%s*%s\n",c,a,b);
    if(j[i]=='/')
       printf("\tt%d=%s/%s\n",c,a,b);
    if(j[i]=='+')
       printf("\tt%d=%s+%s\n",c,a,b);if(j[i]=='-')
       printf("\tt%d=%s-%s\n",c,a,b);
    if(j[i]=='=')
       printf("\t%c=t%d",j[i-1],--c);
       sprintf(ch,"%d",c);
       j[i]=ch[0];
       c++;
       small();
}

void small()
{
    pi=0;l=0;
    for(i=0;i<strlen(j);i++)
    {
       for(m=0;m<5;m++)
          if(j[i]==sw[m])
             if(pi<=p[m])
             {
                pi=p[m];
                l=1;
                k=i;
             }
    }
    if(l==1)
       dove(k);
    else
       exit(0);
}
```

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source code | main.c

```c
#include<stdio.h>
#include<ctype.h>
#include<stdlib.h>
#include<string.h>

void small();
void dove(int i);
int p[5]={0,1,2,3,4},c=1,i,k,l,m,pi;
char sw[5]={'=','-','+','/','*'},j[20],a[5],b[5],ch[2];

void main()
{
    printf("Enter the expression:");
    scanf("%s",j);
    printf("\tThe Intermediate code is:\n");
    small();
}

void dove(int i)
{
    a[0]=b[0]='\0';
    if(!isdigit(j[i+2])&&!isdigit(j[i-2]))
    {
        a[0]=j[i-1];
        b[0]=j[i+1];
    }
    if(isdigit(j[i+2]))
    {
        a[0]=j[i-1];
        b[0]='t';
        b[1]=j[i+2];
    }
    if(isdigit(j[i-2]))
    {
        b[0]=j[i+1];
        a[0]='t';
        a[1]=j[i-2];
        b[1]='\0';
    }
```

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source code | main.c

```c
    if(isdigit(j[i+2]) &&isdigit(j[i-2]))
    {
        a[0]='t';
        b[0]='t';
        a[1]=j[i-2];
        b[1]=j[i+2];
        sprintf(ch,"%d",c);
        j[i+2]=j[i-2]=ch[0];
    }
    if(j[i]=='*')
        printf("\tt%d=%s*%s\n",c,a,b);
    if(j[i]=='/')
        printf("\tt%d=%s/%s\n",c,a,b);
    if(j[i]=='+')
        printf("\tt%d=%s+%s\n",c,a,b);if(j[i]=='-')
        printf("\tt%d=%s-%s\n",c,a,b);
    if(j[i]=='=')
        printf("\t%c=t%d",j[i-1],--c);
        sprintf(ch,"%d",c);
        j[i]=ch[0];
        c++;
        small();
}

void small()
{
    pi=0;l=0;
    for(i=0;i<strlen(j);i++)
    {
        for(m=0;m<5;m++)
            if(j[i]==sw[m])
                if(pi<=p[m])
                {
                    pi=p[m];
                    l=1;
                    k=i;
                }
    }
    if(l==1)
        dove(k);
    else
        exit(0);
}
```

Output:-

When input is:

a=b+c-d

as shown in the following output