Practical 8

Compiler Construction

2CS701

Mistry Unnat

20BCE515

Department of Computer Science and Engineering

Institute of Technology

Nirma University

Ahmedabad

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Aim :

To implement a Type Checker.

Code :

```
#include<stdio.h>
#include<stdlib.h>
int main()
{
    int n,i,k,flag=0;
    char vari[15],typ[15],b[15],c;
    printf("Enter the number of variables:");
    scanf("%d",&n);
    for(i=0; i<n; i++)
    {
        printf("Enter the variable[%d]:",i);
        scanf(" %c",&vari[i]);
        printf("Enter the variable-type[%d](float-f,int-i):",i);
        scanf(" %c",&typ[i]);

            flag=1;
    }
    printf("Enter the Expression(end with $):");
    i=0;
    getchar();

while((c=getchar())!='$')
    {
        b[i]=c;
        i++;
    }
    k=i;
    for(i=0; i<k; i++)
    {
```

```
            if(b[i]=='/')
            {
                flag=1;
                break;
            }
        }
        for(i=0; i<n; i++)
        {
            if(b[0]==vari[i])
            {
                if(flag==1)
                {
                    if(typ[i]=='f')
                    {
                        printf("\nThe datatype of %c is correctly defined \n",vari[i]);
                        break;
                    }
                    else
                    {
                        printf("Identifier %c must be a float type \n",vari[i]);
                        break;
                    }
                }
                else
                {

    printf("\nThe datatype of %c is correctly defined\n",vari[i]);
                    break;
                }
            }
        }
        return 0;
    }
```

Output :

```
Enter the number of variables:4
Enter the variable[0]:A
Enter the variable-type[0](float-f,int-i):i
Enter the variable[1]:B
Enter the variable-type[1](float-f,int-i):i
Enter the variable[2]:C
Enter the variable-type[2](float-f,int-i):f
Enter the variable[3]:D
Enter the variable-type[3](float-f,int-i):i
Enter the Expression(end with $):A=B*C/D$
Identifier A must be a float type

Process returned 0 (0x0)   execution time : 42.889 s
Press any key to continue.
```

```
Enter the number of variables:3
Enter the variable[0]:x
Enter the variable-type[0](float-f,int-i):i
Enter the variable[1]:y
Enter the variable-type[1](float-f,int-i):i
Enter the variable[2]:z
Enter the variable-type[2](float-f,int-i):i
Enter the Expression(end with $):x=y*z$

The datatype of x is correctly defined

Process returned 0 (0x0)   execution time : 49.836 s
Press any key to continue.
```