Practical 8

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Aim

To implement a type checker

Code

```
#include<bits/stdc++.h>
#define ANSI_COLOR_RED     "\x1b[1;31m"
#define ANSI_COLOR_GREEN   "\x1b[1;32m"
#define ANSI_COLOR_RESET   "\x1b[0m"

using namespace std;

int main()
{
   int n,i,k,flag=0;
   char var[10],typ[10],b[10],c;

   cout<<"Enter number of variables:";
   cin>>n;

   for(i=0;i<n;i++)
   {
       char t;

       cout<<"var-"<<i<<": ";
       cin>>t;
       var[i]=t;

       cout<<"type of var-"<<i<<": ";
       cin>>t;
       typ[i]=t;

       if(typ[i]=='f')
           flag=1;
   }
   cout<<"Enter the Expression ending 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]==var[i])
        {
            if(flag==1)
            {
                if(typ[i]=='f')
                {
                    cout<<ANSI_COLOR_GREEN "The Data-type is correct\n"
ANSI_COLOR_RESET;
                    break;
                }
                else
                {
                    cout<<ANSI_COLOR_RED "\'"<<var[i]<<"\'"<<" must be a float
type.. \n" ANSI_COLOR_RESET;
                    break;
                }
            }
            else
            {
                cout<<ANSI_COLOR_GREEN "The Data-type is correct\n"
ANSI_COLOR_RESET;
                break;
            }
        }
    }
    return 0;
}
```

Input-Output

```
(base) rajat@rajat-VivoBook-S14-X430UA:/Rajat1/Books/Compiler Construction/Practicals/Practical8$ ./Prac-8
Enter number of variables:3
var-0: a
type of var-0: f
var-1: b
type of var-1: i
var-2: c
type of var-2: i
Enter the Expression ending with ';' :a+b/c;
The Data-type is correct
(base) rajat@rajat-VivoBook-S14-X430UA:/Rajat1/Books/Compiler Construction/Practicals/Practical8$
```

```
(base) rajat@rajat-VivoBook-S14-X430UA:/Rajat1/Books/Compiler Construction/Practicals/Practical8$ ./Prac-8
Enter number of variables:3
var-0: a
type of var-0: i
var-1: b
type of var-1: f
var-2: c
type of var-2: f
Enter the Expression ending with ';' :a+b*c;
'a' must be a float type..
(base) rajat@rajat-VivoBook-S14-X430UA:/Rajat1/Books/Compiler Construction/Practicals/Practical8$
```

Conclusion

Type checking is one of the most important parts of the semantic analysis phase of compiler design. Here we implemented a simple type checker which can check float and integer data types compatibility.