Compiler Lab Class Work 1
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BCSE-III A3

1) Given a Roman numeral, find its corresponding decimal value.

```
%{
int i;
%}

%%
I i=1;
II i=2;
III i=3;
IV i=4;
V i=5;
VI i=6;
VII i=7;
VIII i=8;
IX i=9;
X i=10;
XI i=11;
XII i=12;
XIII i=13;
XIV i=14;
XV i=15;
XVI i=16;
XVII i=17;
XVIII i=18;
XIX i=19;
XX i=20;
. i=-1;
%%

int yywrap(){return 1;}
int main(){
        yylex();
        if(i==-1)
```

```
            printf("Invalid input\n");
        else
            printf("\ndecimal value = %d\n",i);

        return 0;
    }
```

```
Ritobrotos-MacBook-Air:compilerlabwork1 rgdgr8$ a.out
IX

^D
decimal value = 9
Ritobrotos-MacBook-Air:compilerlabwork1 rgdgr8$ a.out
VIII

^D
decimal value = 8
```

2) Given an arithmetic expression using Roman numerals, find the value of the expression. Use only addition, subtraction, multiplication and division.

```
%{
double a[100];
int i = 0;
char e = 'n';
%}

%%
I a[i++]=1;
II a[i++]=2;
III a[i++]=3;
IV a[i++]=4;
V a[i++]=5;
VI a[i++]=6;
VII a[i++]=7;
VIII a[i++]=8;
IX a[i++]=9;
X a[i++]=10;
XI a[i++]=11;
XII a[i++]=12;
XIII a[i++]=13;
XIV a[i++]=14;
XV a[i++]=15;
```

```
XVI a[i++]=16;
XVII a[i++]=17;
XVIII a[i++]=18;
XIX a[i++]=19;
XX a[i++]=20;
[+] a[i++]='+';
[-] a[i++]='-';
[*] a[i++]='*';
[/] a[i++]='/';
[ ] e = 'n';
. {e = 'e';printf("error");}
%%

void pr(double *a){
	printf("i=%d e=%c\n",i,e);
	for(int j=0;j<i;j++)
		printf("%lf ",a[j]);
	printf("\n");
}

int yywrap(){return 1;}
int main(){
	yylex();
	//pr(a);
	if(e=='e' || i<1 || i%2==0)
		printf("Invalid input\n");
	else{
		/*double res = 0;
		if(a[1]=='*')
			res = a[0]*a[2];
		else if(a[1]=='/')
			res = a[0]/a[2];
		else if(a[1]=='+')
			res = a[0]+a[2];
		else if(a[i]=='-')
			res = a[0]-a[2];

		printf("\n%lf\n",res);*/
		double b[100];
		int k = 0;
		for(int j=0;j<i;j++){
			if(a[j]=='*'){
				b[k-1] = b[k-1]*a[j+1];
				j++;
			}
```

```
                else if(a[j]=='/'){
                        b[k-1] = b[k-1]/a[j+1];
                        j++;
                }else{
                        b[k++] = a[j];
                }
                //pr(b);
        }
        double res = b[0];
        for(int j=1;j<i;j+=2){
                if(b[j]=='+')
                        res += b[j+1];
                else if(b[j]=='-')
                        res -= b[j+1];
        }

        printf("\n%lf\n",res);
    }

    return 0;
}
```

```
Ritobrotos-MacBook-Air:compilerlabwork1 rgdgr8$ a.out
XX+X/V

^D
22.000000
Ritobrotos-MacBook-Air:compilerlabwork1 rgdgr8$ a.out
VIII+V/II

^D
10.500000
```