



程序设计基础实验

The Basic Experiments of Programming Design

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Outlines



一、“简易计算器”功能实现



实验4：“简易计算器” V0



给定一个字符串表达式，打印其结果

```
1  #include<stdio.h>
2
3  int main()
4  {
5      char strExp[]="3+4";
6      //Your task is to print the result of strExp
7
8      return 0;
9  }
```



实验4：“简易计算器” V1



给定一个字符串表达式，打印其结果

```
1  #include<stdio.h>
2
3  int main()
4  {
5      char strExp[]="1+2+2+1+2+5+4-1-3+4-8";
6      //Your task is to print the result of strExp
7
8      return 0;
9  }
```



实验4：“简易计算器” V2



给定一个字符串表达式，打印其结果

```
1  #include<stdio.h>
2
3  int main()
4  {
5      char strExp[]="2*2/4*1/1*2*3/2";
6      //Your task is to print the result of strExp
7
8      return 0;
9  }
```



实验4：“简易计算器” V3



给定一个字符串表达式，打印其结果

```
1  #include<stdio.h>
2
3  int main()
4  {
5      char strExp[]="2+2*3+2/2-1";
6      //Your task is to print the result of strExp
7
8      return 0;
9  }
```



实验4：“简易计算器” V3



```
char strExp[] = “2+2*3+2/2-1” ;
```

分析： 加減乘除？

1、先算乘除

2、再算加減



实验4：“简易计算器” V3



char strExp[] = “2+2*3+2/2-1” ;

2+2*3+2/2-1



先算乘除

2+6+1-1



V1



实验4：“简易计算器” V3



```
char strExp[] = "2+2*3+2/2-1" ;
```

$$2 + 2 * 3 + 2 / 2 - 1$$


先算乘除

$$2 + 6 + 1 - 1$$

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----

[illegible]

```
char strExp[] = "2+2*3+2/2-1" ;
```



先算乘除

$$2 + 6 + 1 - 1$$

```
for(int i=0;i<strlen(strExp);i++)
{
    if(strExp[i]=='*') // 处理乘法
    if(strExp[i]=='/') // 处理除法
}
```

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----

[illegible]



```
char strExp[] = "2+2*3+2/2-1" ;
```

↓ 先算乘除

$$2 + 6 + 1 - 1$$

```
for(int i=0;i<strlen(strExp);i++)
{
    if(strExp[i]=='*') // 处理乘法
    if(strExp[i]=='/') // 处理除法
}
```

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----

[illegible]


```
char strExp[] = "2+2*3+2/2-1" ;
```

↓ 先算乘除

$$2+6+1-1$$

```
for(int i=0;i<strlen(strExp);i++)
{
    if(strExp[i]=='*') // 处理乘法
    if(strExp[i]=='/') // 处理除法
}
```


$$2 * 3 = 6$$


```
char strExp[] = "2+2*3+2/2-1" ;
```

↓ 先算乘除

$$2 + 6 + 1 - 1$$

```
for(int i=0;i<strlen(strExp);i++)
{
    if(strExp[i]=='*') // 处理乘法
    if(strExp[i]=='/') // 处理除法
}
```

Diagram illustrating the stack state after the third operation (multiplication). The stack contains the tokens: 2, +, 2, *, 3, +, 2, /, 2, -, 1, \0. The token '3' is circled in red.

↑ $2 * 3 = 6$

A number line from 0 to 10. The number 2 is in the second box, and the number 6 is in the sixth box. A red circle is drawn around the number 6.



实验4：“简易计算器” V3



char strExp[] = “2+2*3+2/2-1” ;

2+2*3+2/2-1



先算乘除

2+6+1-1

```
for(int i=0;i<strlen(strExp);i++)  
{  
    if(strExp[i]=='*') // 处理乘法  
    if(strExp[i]=='/') // 处理除法  
}
```

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----



2	+	6	+								
---	---	---	---	--	--	--	--	--	--	--	--



实验4：“简易计算器” V3



char strExp[] = “2+2*3+2/2-1” ;

2+2*3+2/2-1



先算乘除

2+6+1-1

```
for(int i=0;i<strlen(strExp);i++)  
{  
    if(strExp[i]=='*') // 处理乘法  
    if(strExp[i]=='/') // 处理除法  
}
```

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----



2	+	6	+	2							
---	---	---	---	---	--	--	--	--	--	--	--



实验4：“简易计算器” V3



char strExp[] = “2+2*3+2/2-1” ;

2+2*3+2/2-1



先算乘除

2+6+1-1

```
for(int i=0;i<strlen(strExp);i++)  
{  
    if(strExp[i]=='*') // 处理乘法  
    if(strExp[i]=='/') // 处理除法  
}
```

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----



2/2=1

2	+	6	+	2							
---	---	---	---	---	--	--	--	--	--	--	--



实验4：“简易计算器” V3



char strExp[] = “2+2*3+2/2-1” ;

2+2*3+2/2-1



先算乘除

2+6+1-1

```
for(int i=0;i<strlen(strExp);i++)  
{  
    if(strExp[i]=='*') // 处理乘法  
    if(strExp[i]=='/') // 处理除法  
}
```

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----



2/2=1

2	+	6	+	1							
---	---	---	---	---	--	--	--	--	--	--	--



实验4：“简易计算器” V3



char strExp[] = “2+2*3+2/2-1” ;

2+2*3+2/2-1



先算乘除

2+6+1-1

```
for(int i=0;i<strlen(strExp);i++)  
{  
    if(strExp[i]=='*') // 处理乘法  
    if(strExp[i]=='/') // 处理除法  
}
```

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----



2	+	6	+	1	-						
---	---	---	---	---	---	--	--	--	--	--	--



实验4：“简易计算器” V3



char strExp[] = “2+2*3+2/2-1” ;

2+2*3+2/2-1



先算乘除

2+6+1-1

```
for(int i=0;i<strlen(strExp);i++)  
{  
    if(strExp[i]=='*') // 处理乘法  
    if(strExp[i]=='/') // 处理除法  
}
```

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----



2	+	6	+	1	-	1					
---	---	---	---	---	---	---	--	--	--	--	--



实验4：“简易计算器” V3



char strExp[] = “2+2*3+2/2-1” ;

2+2*3+2/2-1



先算乘除

2+6+1-1

```
for(int i=0;i<strlen(strExp);i++)  
{  
    if(strExp[i]=='*') // 处理乘法  
    if(strExp[i]=='/') // 处理除法  
}
```

2	+	2	*	3	+	2	/	2	-	1	\0
---	---	---	---	---	---	---	---	---	---	---	----



结束

2	+	6	+	1	-	1					
---	---	---	---	---	---	---	--	--	--	--	--

2+6+1-1



简易计算器V1



实验4：“简易计算器” V3



```
1  #include<stdio.h>
2  #include<string.h>
3  int main()
4  {
5      char strExp[]="2+2*3+2/2-1";
6      char strTmp[strlen(strExp)];
7
8      // handle * /
9      int strTmpIndex=-1;
10     for(int i=0;i<strlen(strExp);i++)
11     {
12         if(strExp[i]=='*')
13         {
14             int leftOperand = strTmp[strTmpIndex] - '0';
15             int rightOperand = strExp[i+1] - '0';
16             strTmp[strTmpIndex] = leftOperand * rightOperand + '0';
17             i++;
18         }
19         else if(strExp[i]=='/')
20         {
21             int leftOperand = strTmp[strTmpIndex] - '0';
22             int rightOperand = strExp[i+1] - '0';
23             strTmp[strTmpIndex] = leftOperand / rightOperand + '0';
24             i++;
25         }
26         else strTmp[++strTmpIndex]=strExp[i];
27     }
28
29     // handle + -
30     int res=strTmp[0]-'0';
31     for(int i=1;i<strlen(strTmp);i++)
32     {
33         if(strTmp[i]=='+') res += strTmp[++i]-'0';
34         else if(strTmp[i]=='-') res -= strTmp[++i]-'0';
35     }
36
37     printf("%d\n",res);
38     return 0;
39 }
40 |
```



实验4：“简易计算器” V4



给定一个字符串表达式，打印其结果

```
1 #include<stdio.h>
2 int main()
3 {
4     char strExp[]="1-2.5*4+10.2/5.1";
5     //Your task is to print the result of strExp
6
7     return 0;
8 }
9 |
```



同学们编程实现“简易计算器” V4

要求：

1. 理解并修改你的“简易计算器” V3
2. 编写V4
3. 上传代码到仓库(上一次的)
4. 流程图 + 代码 + 链接



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The End



Q&A