第六次上机

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第一题

```
#include<stdio.h>

//教材上的要求并不合理，在此用比较简洁的方法来完成

int max_divider(int a, int b)
{
    while (a != 0)
    {
        int temp = a;
        a = b;
        b = temp;
        a = a % b;
    }
    return b;
}

int min_mul(int a, int b)
{
    return a * b / max_divider(a, b);
}

int main()
{
    int x, y;
    scanf_s("%d%d", &x, &y);

    printf("%d\n", max_divider(x, y));
    printf("%d\n", min_mul(x, y));

}
```

第二题

```
#include<stdio.h>

int count(char str[], int rule(char))
{
    int i = 0;
    int result = 0;
    while (str[i])
    {
        if (rule(str[i]))
        {
            ++result;
```

```
        }
        ++i;
    }
    return result;
}


int character(char c)
{
    return ((c <= 'z'&&c >= 'a') || (c <= 'Z'&&c >= 'A'));
}
int digit(char c)
{
    return (c <= '9'&&c >= '0');
}

int space(char c)
{
    return c == ' ';
}

int others(char c)
{
    return !character(c) && !digit(c) && !space(c);
}

int main()
{
    char str[200];

    gets(str);

    printf("character:%d\n", count(str, character));
    printf("digit:%d\n", count(str, digit));
    printf("others:%d\n", count(str, others));
    printf("space:%d\n", count(str, space));

}
```

第三题

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

int score[10][5] = { {1,2,3,4,5} };

double buffer10[10];
double buffer5[5];


void ave_stu()
{
    for (int i = 0; i < 10; i++)
```

```
    {
        double result = 0;

        for (int j = 0; j < 5; j++)
        {
            result += score[i][j];
        }
        buffer10[i] = result / 5;
    }
}

void ave_course()
{
    for (int i = 0; i < 5; i++)
    {
        double result = 0;

        for (int j = 0; j < 10; j++)
        {
            result += score[j][i];
        }
        buffer5[i] = result / 10;
    }
}

void get_top(int *stu, int* course)
{
    int temp_score = 0;
    for (int i = 0; i < 10; i++)
    {
        for (int j = 0; j < 5; j++)
        {
            if (score[i][j]>temp_score)
            {
                temp_score = score[i][j];
                *stu = i;
                *course = j;
            }
        }
    }
}

double square_diff()
{
    double temp = 0;
    for (int i = 0; i < 10; i++)
    {
        temp += buffer10[i] * buffer10[i];
    }

    double temp2 = 0;
    for (int i = 0; i < 10; i++)
    {
        temp2 += buffer10[i];
    }
    temp2 /= 10;
    temp2 *= temp2;
    return (temp / 10) - temp2;
```

```
}


int main()
{
    for (int i = 0; i < 5; i++)
    {
        for (int j = 0; j < 10; j++)
        {
            score[j][i] = rand() % 100;
            printf("%5d", score[j][i]);
        }
        printf("\n");
    }

    ave_stu();
    ave_course();
    int i, j;
    get_top(&i, &j);

    printf("The average on student is:\n");
    for (int i = 0; i < 10; i++)
    {
        printf("%5.1lf", buffer10[i]);
    }
    printf("\n");


    printf("The average on course is:\n");
    for (int i = 0; i < 5; i++)
    {
        printf("%5.1lf", buffer5[i]);
    }
    printf("\n");

    printf("The square difference on student is %10.1lf :\n",square_diff());

    printf("\n");

    printf("The highest score is at student %d on course %d", i, j);
}
```

第四题

```
#include<stdio.h>
#define PRODUCT(a,b) a*b

void fun(int i)
{
    static int x = 1;
    x += PRODUCT(x + i, x - i);
    printf("x=%d\n", x);
}
```

```
int main()
{
    int i, x = 1;
    for (int i = 1; i <=3; i++)
    {
        fun(x + i);
    }

}
```

第五题

```
#include<stdio.h>
#include<math.h>

char buffer[200];

double my_atof(char str[])
{
    int result = 0;
    int i = 0;
    int minus_flag = 0;
    int point_flag = 0;
    double expo = 0;

    while (str[i]!=0)
    {
        if (str[i]=='-')
        {
            minus_flag = 1;
        }


        if (str[i] == 'e' || str[i] == 'E')//if的上下文不能改
        {
            expo += my_atof(str + i + 1);//递归调用
            break;
        }
        if (point_flag)
        {
            --expo;
        }
        if (str[i]<='9'&&str[i]>='0')
        {
            result *= 10;
            result += str[i] - '0';
        }
        else if (str[i] == '.')
        {
            point_flag = 1;
        }

        i++;
```

```
    }

    if (minus_flag)
    {
        result = -result;
    }
    return result * pow(10, expo);
}

int main()
{
    gets(buffer);

    printf("%lf", my_atof(buffer));

}
```

第六题

```
#include<stdio.h>


char buffer[200];
//#define CIPHER

#ifdef CIPHER

void print(char str[])
{
    printf("%s", str);
}

#else

void print(char str[])
{
    int i = 0;
    while (str[i] != 0)
    {
        if (str[i] < 'z' && str[i] >= 'a')
        {
            buffer[i] = str[i] + 1;
        }
        else if(str[i]=='z')
        {
            buffer[i] = 'a';
        }
        else
        {
            buffer[i] = str[i];
        }
        i++;
    }
    printf("%s", buffer);
}
```

```
#endif



int main()
{
    print("C language is a fragile hammer!");
}
```

第七题

```
#include<stdio.h>

double poly(double x, int n)
{
    if (n == 0)
    {
        return 1;
    }
    else if (n == 1)
    {
        return x;
    }
    else
    {
        return (2 * n - 1)*x - poly(x, n - 1) - (n - 1)*poly(x, n - 2) / n;
    }
}

int main()
{
    printf("%lf",poly(0.36, 5));
}
```