

第四次上机实验报告

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最大公约数和最小公倍数

```
#include<stdio.h>

int max_divider(int i,int j)
{
    int r = i;
    while (j%r != 0)
    {
        j = j % r;
        r = r % j;
        if (0==r)
        {
            return j;
        }
    }
    return r;
}

int min_mul(int i, int j)
{
    return i * j / max_divider(i, j);
}

int main()
{
    int a, b;

    printf("Put in 2 numbers:\n");
    while (scanf_s("%d%d", &a, &b))
    {
        printf("The max divider is %d\n", max_divider(a, b));
        printf("The min multiple is %d\n", min_mul(a, b));
        printf("Put in 2 numbers:\n");
    }

    getchar(); getchar();
}
```

运行结果:

```
C:\WSL\code\C_Language\4\Debug\4.exe
Put in 2 numbers:
3 5
The max divider is 1
The min multiple is 15
Put in 2 numbers:
9 6
The max divider is 3
The min multiple is 18
Put in 2 numbers:
100 25
The max divider is 25
The min multiple is 100
Put in 2 numbers:
456 4891
The max divider is 1
The min multiple is 2230296
Put in 2 numbers:
-

return r;

}

int min_mul(int i, int j)
{
    return i * j / max_divider(i, j);
}

int main()
{
    int a, b;

    printf("Put in 2 numbers:\n");
    while (scanf_s("%d%d", &a, &b))
    {
        printf("The max divider is %d\n", max_divide
        printf("The min multiple is %d\n", min_mul(a
        printf("Put in 2 numbers:\n");
    }
}
```

正弦函数泰勒展式计算

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

#define ERROR 1E-8

double my_sin(double x)
{
    double temp = x;

    while(temp>50) temp-=3.1415926535;
    while(temp<=-50) temp+=3.1415926535;

    double result = x;

    double i = 1;

    while (fabs(temp) > ERROR)
    {
        temp *= -(x * x);
        i++;
        temp /= i;
        i++;
        temp /= i;
        result += temp;
    }

    return result;
}

int main()
{
    double temp = 0;
```

```

double x = 0;
printf("Put in x:\n");
while (scanf_s("%lf", &x))
{
    printf("sin(x)=%.9g\n", my_sin(x));
    printf("The error is %.9g\n", my_sin(x) - sin(x));
}
getchar(); getchar();
}

```

运行结果:

```

C:\WSL\code\C_Language\4\Debug\4.exe
Put in x:
1
sin(x)=0.841470985
The error is 7.61946062e-13
2
sin(x)=0.909297427
The error is 4.26925162e-12
3
sin(x)=0.141120008
The error is -2.01152234e-10
4 (scanf_s("%lf", &x))
sin(x)=-0.756802495
The error is -7.09632353e-11
5 printf("The error is %.9g\n", my_sin(x) - sin(x));
sin(x)=-0.958924275
The error is -2.051459e-11
6
sin(x)=-0.279415498
The error is 1.55974955e-10
7
sin(x)=0.656986599
The error is 3.53620466e-11
8
sin(x)=0.989358246
The error is -1.80751081e-10
3.1415926
sin(x)=5.36001413e-08
The error is 1.03481065e-11

```

素数计算

```

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

#define N 500

int max[N+1]; //在堆上创建初始化为0

void sieve(int *arr)
{
    arr[0] = 1;
    arr[1] = 1;
    for (int i = 2; i < sqrt(N)+1; i++) //上限只要小于sqrt[N]就可以
    {
        if (0 == arr[i])
        {
            for (int j = 2; i*j < N+1; j++)
            {
                arr[i*j] = 1;
            }
        }
    }
}

```

```

int main()
{

    sieve(max);

    int counter = 10;

    int result = 0;
    for (int i = N; counter && i > 0 ; i--)
    {
        if (max[i] == 0)
        {
            printf("%d\n", i);
            result += i;
            counter--;
        }
    }

    printf("The sum is %d\n", result);

    if (counter)
    {
        printf("There are not 10 primes in within %d!\n",N);
    }

    getchar();
}

```

```

499
491
487
479
467 main()
463
461
457 sieve(max);
449
443 int counter = 10;
The sum is 4696
-
    int result = 0;
    for (int i = 500; counter && i > 0 ; i--)
    {
        if (max[i] == 0)
        {
            printf("%d\n", i);
            result += i;
            counter--;
        }
    }

    printf("The sum is %d\n", result);

    if (counter)
    {

```

打印图案

```

#include<stdio.h>

#define N 4

int main()

```

```
{
    for (int i = 0; i < N; i++)
    {
        for (int j = 0; j < N - i; j++)
        {
            printf(" ");
        }
        for (int j = 0; j < 2 * i + 1; j++)
        {
            printf("* ");
        }
        printf("\n");
    }
    for (int i = N-2; i >= 0; i--)
    {
        for (int j = 0; j < N - i; j++)
        {
            printf(" ");
        }
        for (int j = 0; j < 2 * i + 1; j++)
        {
            printf("* ");
        }

        printf("\n");
    }

    getchar();
}
```

