**C++第一次实验报告**

**主题：函数和数组**

# 实验1——Rolling Dice

实验目的：通过随机数生成，对两个骰子的投掷结果相加，在36000次随机中得到所有11种结果的实验概率，对两个骰子的得数之和的分布结果得到直观数据。可通过设置i的值改变结果精度。源代码如下：

#include<iostream>

#include<iomanip>

#include<cstdlib> #include<ctime> using namespace std; int a[10000000]; int main() { int a1, a2; double s[100] = { 0,0,2.778,5.556,8.333,11.111,13.889,16.667,13.88 srand(time(0)); for (int i = 2; i <= 36000; i++)

{

a1 = rand() % 6 + 1; a2 = rand() % 6 + 1; a[a1 + a2]++;

} cout << setw(10) << "Sum" << setw(10) << "Total" << setw(10) << "E cout << endl; for (int i = 2; i <= 12; i++)

{ cout << setw(10) << i << setw(10) << a[i] << setw(10) << s[i] cout << endl;

}

}

得到结果示例

Sum Total Expcted Actual 2 1041 2.778% 2.892%

1. 2013 5.556% 5.592%
2. 2948 8.333% 8.189%
3. 3958 11.111% 10.994%
4. 4878 13.889% 13.550%
5. 6147 16.667% 17.075%
6. 5124 13.889% 14.233%
7. 3898 11.111% 10.828%
8. 2995 8.333% 8.319%
9. 1991 5.556% 5.531%
10. 1006 2.777% 2.794%

实验心得：

1.将得到结果和对结果计数合并，利用a[i]++直接得到和及对应次数，类似的，对字符串中a,b,c,d等字符可以用int(a)-96存储到对应的数组内部，提出后任可通过+96得到原字母。

# 实验二——Array

实验目的：通过编辑函数，来实现对数组的各种操作，例如输入输出，合并等。锻炼了学生对底层代码的理解能力，和对数组编辑的能力。

源代码如下：

#include<iostream>

#include<iomanip>

#include<algorithm>

#include<cstdlib>

#include<ctime> #include<math.h> using namespace std; int a[10000000], a1[1000000], a2[1000000], a3[1000000]; int s = 0; int input(int a[],int h)

{

cout << "请输入数组内容\n";

for (int i = 1; i <= h; i++) cin >> a[i]; return 0;

}

int output(int a[],int h)

{

cout << "输出数组\n"; cin >> h;

for (int i = 1; i <= h; i++)cout << a[i] << " "; return 0;

}

int search(int a[],int h, int n)

{

cout << "接下来对该数检索\n"; for (int i = 1; i <= h; i++)

{

if (a[i] == n)return i;

}

return -1;

}

int minimum(int a[],int h)

{

cout << "求最小值\n";

int g = a[1]; int min;

for (int i = 1; i <= h; i++)

{

if (a[i] < g)g = a[i];

}

return g;

}

int maximum(int a[],int h)

{

cout << "求最大值\n";

int g = a[1];

for (int i = 1; i <= h; i++)

{

if (a[i] > g) g = a[i];

}

return g;

}

int minipos(int a[],int h)

{

cout << "最小值所在位置\n";

for (int i = 1; i <= h; i++)

{

if (a[i] == minimum(a,h))return i;

}

return 0;

}

int maxipos(int a[],int h)

{

cout << "最大值所在位置\n";

for (int i = 1; i <= h; i++)

{

if (a[i] == maximum(a,h))return i;

}

return 0;

}

int sum(int a[],int h)

{

cout << "数组和为\n";

int s = 0;

for (int i = 1; i <= h; i++)

{

s += a[i];

}

return s;

}

double average(int a[],int h)

{

cout << "数组的平均数为\n";

double s\_2 = 0;

for (int i = 1; i <= h; i++)s\_2 += a[i]; return s\_2 / h;

}

int even(int a[],int h)

{

cout << "输出数组的偶数项\n";

int e\_1 = 0;

for (int i = 1; i <= h; i++)

{

if (a[i] % 2 == 0)e\_1++;

}

return e\_1;

}

int odd(int a[],int h)

{

cout << "输出数组的奇数项\n";

int o\_1 = 0;

for (int i = 1; i <= h; i++)

{

if (a[i] % 2 != 0)o\_1++;

}

return o\_1;

}

int split(int a1[],int a2[],int a[],int h)

{

cout << "依次输入分裂的两个数组，原数组及对应长度\n"; cout << "将数组分为奇偶两个子数组\n";

int g = 1, s = 1; cout << even(a,h)<<endl;

for (int i = 1; i <= h; i++)

{

if (a[i] % 2 == 0)

{

a1[g] = a[i];

g++;

}

else if (a[i] % 2 != 0)

{

a2[s] = a[i];

}

}

for (int i = 1; i <= even(a,h); i++)

{

cout << a1[i]<<" ";

}

cout << endl << odd(a,h);

for (int i = 1; i <= odd(a,h); i++)

{

cout << a2[i];

}

cout << endl;

return 0;

}

int combine(int a1[], int a2[] ,int h1,int h2,int a[])

{

cout << "依次输入要结合的两个数组，对应长度及原数组\n"; cout << "将两个数组合并为一个\n";

cout << h1 + h2<<endl;

for (int i = 1; i <= h1 + h2; i++)

{

if (i <= h1) a[i] = a1[i];

else a[i] = a2[i - h1];

}

for (int i = 1; i <= h1 + h2; i++)

{

cout << a[i]<<" ";

}

cout << endl;

return 0;

}

int combineordered(int a[], int a1[], int a2[], int h1, int h2)

{

cout << "将两个数组合并且排序\n";

cout << h1 + h2 << endl;

for (int i = 1; i <= h1 + h2;i++)

{

if (i <= h1) a[i] = a1[i]; else a[i] = a2[i - h1];

}

sort(a + 1, a + h1 + h2 + 1);

for (int i = 1; i <= h1 + h2; i++)

{

cout << a[i] << " ";

}

cout << endl; return 0;

}

int main()

{}

结果示例

int main()

{

int n1, n2;

cin >> n1 >> n2;

input(a1, n1); input(a2, n2); combineordered(a, a1, a2, n1, n2);

}

3 3

请输入数组内容

3 4 5

请输入数组内容

2 1 7

将两个数组合并且排序

6

1 2 3 4 5 7

实验心得：

1.随手一个cout<<endl是好习惯

2.可以在一个函数中嵌套另一个函数，由此可以构建一个递归使得交替输出或得到结果，或将函数组合并成类能更好的提高交互性