programming in C++

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Parts

Part 1

Basic programming

Part 2

Control structure such as loops and if-else

Part 3

Vector, Functions and Input/Ouput (Today)

Table of Contents

Write File

Source Code

```
#include <iostream>
#include <fstream>
using namespace std;
int main()
{
    ofstream myfile;
    myfile.open
("C:\\example.txt");
    myfile<<1<<'\t'<<
2<<endl;
    myfile<<3<<'\t'<<
4<<endl;
    myfile.close();
cin.get();
}
```

File

data

Write File

Source Code

```
#include <iostream>
#include <fstream>
using namespace std;
int main()
{
    ofstream myfile;
    myfile.open
("C:\\example.txt");
    myfile<<1<<'\t'<<
2<<endl;
    myfile<<3<<'\t'<<
4<<endl;
    myfile.close();
cin.get();
}
```

File

data

Write File

Source Code

```
#include <iostream>
#include <fstream>
using namespace std;
int main()
{
    ofstream myfile;
    myfile.open
("C:\\example.txt");
    myfile<<1<<'\t'<<
2<<endl;
    myfile<<3<<'\t'<<
4<<endl;
    myfile.close();
cin.get();
}
```

File

data

Write File

Source Code

```
#include <iostream>
#include <fstream>
using namespace std;
int main()
{
    ofstream myfile;
    myfile.open
("C:\\example.txt");
    myfile<<1<<'\t'<<
2<<endl;
    myfile<<3<<'\t'<<
4<<endl;
    myfile.close();
cin.get();
}
```

File

1 2

data

Write File

Source Code

```
#include <iostream>
#include <fstream>
using namespace std;
int main()
{
    ofstream myfile;
    myfile.open
("C:\\example.txt");
    myfile<<1<<'\t'<<
2<<endl;
    myfile<<3<<'\t'<<
4<<endl;
    myfile.close();
cin.get();
}
```

File

1 2
3 4

data

Write File

Source Code

```
#include <iostream>
#include <fstream>
using namespace std;
int main()
{
    ofstream myfile;
    myfile.open
("C:\\example.txt");
    myfile<<1<<'\t'<<
2<<endl;
    myfile<<3<<'\t'<<
4<<endl;
    myfile.close();
cin.get();
}
```

File

1 2
3 4

data

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

data

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

data

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

data

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

data

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

data

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

data

line

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

data

line= 1 2

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

```
1       2
```

data

line= 1 2

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

```
1       2
```

data

line= 3 4

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

```
1       2
3       4
```

data

line= 3 4

Read File

Source Code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;
int main()
{
    ifstream myfile;
    myfile.open
("C:\\example.txt");
    string line;
    while(getline(myfile,line))
    {
    cout<<line<<endl;
    }
    myfile.close();
}
```

Output

```
1       2
3       4
```

data

```
line= 3       4
```

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

token

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

token

Splitting of a string

Source Code

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#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

token

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

token

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

token

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

token=56.5

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

token=56.5

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

token=56.5

info=56.5

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

line="56.5,54.32"

token=54.32

info=56.5

Splitting of a string

Source Code

```
#include <iostream>
#include <sstream>
using namespace std;
int main()
{
    string line="56.5,54.32";
    string  token;
    stringstream ss(line);
    while(getline(ss, token,','))
    {
double info=atof(token.c_str());
    }
}
```

Output

data

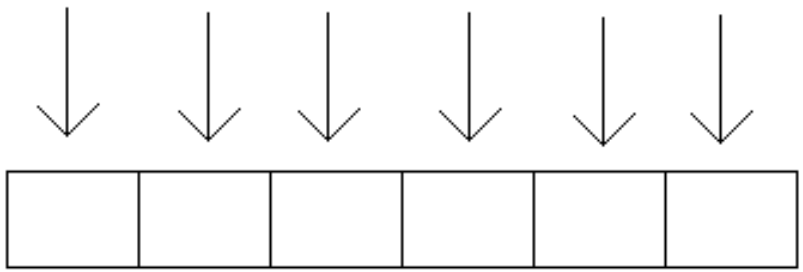
line="56.5,54.32"

token=54.32

info=54.32

Table of Contents

Graphical Representation



Vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<int> MyList(2)
     MyList[0]=1;
     MyList[1]=2;
     MyList.push_back(5);
     cout<<MyList[0]<<endl;
     cout<<MyList[1]<<endl;
     cout<<MyList[2]<<endl;
}
```

Output

data

array1[0]=0
array1[1]=0

Vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<int> MyList(2)
     MyList[0]=1;
     MyList[1]=2;
     MyList.push_back(5);
     cout<<MyList[0]<<endl;
     cout<<MyList[1]<<endl;
     cout<<MyList[2]<<endl;
}
```

Output

data

array1[0]=1

array1[1]=0

Vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<int> MyList(2)
     MyList[0]=1;
     MyList[1]=2;
     MyList.push_back(5);
     cout<<MyList[0]<<endl;
     cout<<MyList[1]<<endl;
     cout<<MyList[2]<<endl;
}
```

Output

data

array1[0]=1

array1[1]=2

Vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<int> MyList(2)
     MyList[0]=1;
     MyList[1]=2;
     MyList.push_back(5);
     cout<<MyList[0]<<endl;
     cout<<MyList[1]<<endl;
     cout<<MyList[2]<<endl;
}
```

Output

data

array1[0]=1
array1[1]=2
array1[2]=5

Vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<int> MyList(2)
     MyList[0]=1;
     MyList[1]=2;
     MyList.push_back(5);
     cout<<MyList[0]<<endl;
     cout<<MyList[1]<<endl;
     cout<<MyList[2]<<endl;
}
```

Output

1

data

array1[0]=1
array1[1]=2
array1[2]=5

Vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<int> MyList(2)
     MyList[0]=1;
     MyList[1]=2;
     MyList.push_back(5);
     cout<<MyList[0]<<endl;
     cout<<MyList[1]<<endl;
     cout<<MyList[2]<<endl;
}
```

Output

1
2

data

array1[0]=1
array1[1]=2
array1[2]=5

Vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<int> MyList(2)
     MyList[0]=1;
     MyList[1]=2;
     MyList.push_back(5);
     cout<<MyList[0]<<endl;
     cout<<MyList[1]<<endl;
     cout<<MyList[2]<<endl;
}
```

Output

1
2
5

data

array1[0]=1
array1[1]=2
array1[2]=5

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

data

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

data

MyList[0]=0
MyList[1]=0

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

data

MyList[0]=1.2
MyList[1]=0

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

data

MyList[0]=1.2
MyList[0]=2.2

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

data

MyList[0]=1.2
MyList[0]=2.2

i=0

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

data

MyList[0]=1.2
MyList[0]=2.2

i=0

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

the value is 1.2

data

MyList[0]=1.2
MyList[0]=2.2

i=0

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

the value is 1.2

data

MyList[0]=1.2
MyList[0]=2.2

i=1

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

the value is 1.2

data

MyList[0]=1.2
MyList[0]=2.2

i=1

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

the value is 1.2

the value is 2.2

data

MyList[0]=1.2

MyList[0]=2.2

i=1

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

the value is 1.2
the value is 2.2

data

MyList[0]=1.2
MyList[0]=2.2

i=2

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

the value is 1.2
the value is 2.2

data

MyList[0]=1.2
MyList[0]=2.2

i=2

loops and vector example

Source Code

```
#include <iostream>
#include <vector>
using namespace std;
int main()
{
    vector<double> MyList(2);
    MyList[0]=1.2;
    MyList[1]=2.2;
for(int i=0;i<MyList.size();i=i+1)
    {
    cout<<"the value is "
<<MyList[i]<<endl;
    }
}
```

Output

the value is 1.2
the value is 2.2

data

MyList[0]=1.2
MyList[0]=2.2

i=2

Intro to functions

- Function description (done in the header (.h) file)
- Function implementation (done in the c++ (.cpp) file)
- Calling the function

header file (.h-file)

Source Code

```
double mean(double a,  double b);
```

header file (.h-file)

Source Code

```
double mean(double a,  double b);
```

header file (.h-file)

Source Code

```
double mean(double a,  double b);
```

body file (.cpp-file)

Source Code

```
double mean(double a, double b) {

double value=(a+b);
return value; }
```

body file (.cpp-file)

Source Code

```
double mean(double a, double b) {

double value=(a+b);
return value; }
```

body file (.cpp-file)

Source Code

```
double mean(double a, double b) {

double value=(a+b);
return value; }
```

body file (.cpp-file)

Source Code

```
double mean(double a, double b) {

double value=(a+b);
return value; }
```

body file (.cpp-file)

Source Code

```
double mean(double a, double b) {

double value=(a+b);
return value; }
```

Using the function

Source Code

```
#include <iostream>
"function1.h"
using namespace std;
int main()
{
double result =mean(2,2);

}
```

Using the function

Source Code

```
#include <iostream>
"function1.h"
using namespace std;
int main()
{
double result =mean(2,2);

}
```

Using the function

Source Code

```
#include <iostream>
"function1.h"
using namespace std;
int main()
{
double result =mean(2,2);

}
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Using the function

Source Code

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#include <iostream>
"function1.h"
using namespace std;
int main()
{
double result =mean(2,2);

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