

Correction TD3, C++, L3, FLIN 606 Suite

Suit.h

```
class Suit{
public:
    Suit();
    virtual ~Suit();
    virtual float operator()(int)const=0;
    virtual float S(int)const;
    virtual ostream& Affiche(ostream& os)const=0;
    virtual istream& Saisie(istream& is)=0;

};

ostream& operator<< (ostream&, const Suit&);
istream& operator>> (istream&, Suit&);
```

SuitConst.h

```
class SuitConst : virtual public Suit{
private:
vector<float> u; // valeurs des rg termes precedant les termes constants
int  rg;//rang a partir duquel la suite est constante (et longueur de u)
float a; //valeur commune des termes de la suite a partir du rang rg

public:
SuitConst(int val=0); // cree la suite constante de valeur val
virtual ~SuitConst();
virtual float operator()(int)const;
virtual int rang() const;
virtual ostream& Affiche(ostream& os)const;
virtual istream& Saisie(istream& is);
};
```

SuitArith.h

```
//#include "Suit.h"
class SuitArith: virtual public Suit{
private:
float u0, //terme initial
    r; //raison

public:
SuitArith(float init=0,float raison=0);
virtual ~SuitArith();
virtual float operator()(int)const;
virtual float S(int)const;
virtual float raison()const;
virtual ostream& Affiche(ostream& os)const;
virtual istream& Saisie(istream& is);

};
```

Suit.cc

```
#include <iostream>
using namespace std;
#include "Suit.h"

Suit::Suit(){}
Suit::~Suit(){}

float Suit::S(int n)const
{float som=0;
for (int i=0;i<n;i++) som += (*this)(i);
return som;}

ostream& operator<< (ostream& os, const Suit& s) {s.Affiche(os);return os;}
istream& operator>> (istream& is, Suit& s){s.Saisie(is);return is;}
```

SuitConst.cc

```
#include <iostream>
#include<vector>
using namespace std;
#include "Suit.h"
#include "SuitConst.h"

SuitConst::SuitConst(int val) {a=val; rg=0;}

SuitConst::~SuitConst() {}

float SuitConst::operator()(int n)const
{if (n>=rang()) return a;
  else
    return u[n];
}

int SuitConst::rang() const {return rg;}

ostream& SuitConst::Affiche(ostream& os)const
{
    os <<"(";
    for (int i=0; i<u.size(); i++) cout << u[i] <<" ";
    os<<a <<" ...)"<<endl;
    return os;
} //<<u

istream& SuitConst::Saisie(istream& is)
{float v;
  cout<< "rang \n";is>>rg;
  cout<<"valeurs \n";
  for (int i=0; i<rg; i++)
  {
      //cout << " entrez valeur de rang" << i << endl;
      float f; is >> f; u.push_back(f);
  }
  cout<<"valeur constante finale\n";is>>a;
  return is;
}
```

SuitArith.cc

```
#include <iostream>
using namespace std;
#include "Suit.h"
#include "SuitArith.h"
```

```
SuitArith::SuitArith(float init, float raison)
{u0=init;r=raison;}
```

```
SuitArith::~~SuitArith(){} 
```

```
float SuitArith::operator()(int n)const
{return (u0+n*r);}
```

```
float SuitArith::S(int n)const
{return (n*(this->u0)+n*(n-1)*(r/2));}
```

```
float SuitArith::raison()const { return r;}
```

```
ostream& SuitArith::Affiche(ostream& os)const
{os <<"terme initial = " <<(this->u0) <<"  raison = " <<raison()<<"\n";
return os;}
```

```
istream& SuitArith::Saisie(istream& is)
{ is>>u0 >>r; return is;}
```

SuitMain.cc

```
#include <iostream>
#include<vector>
using namespace std;
#include "Suit.h"
#include "SuitArith.h"
#include "SuitConst.h"

main()
{
//Suits arithmetiques
SuitArith sa1(7,2);SuitArith sa2;
cout << "SUITES ARITHMETIQUES\n";
  cin>>sa2;
cout <<"sa1 " <<sa1 <<"\n";cout <<"sa2 " <<sa2 <<"\n";
cout << "8eme terme de sa1 " <<sa1(7) <<endl;
cout << "somme des 10 premiers termes de sa1 " <<sa1.S(10)<<endl;
cout << "somme des 10 premiers termes de sa2 " <<sa2.S(10)<<endl;

//suites constantes a partir d'un certain rang
SuitConst sc1,sc2,sc3(5);
cout << "SUITES CONSTANTES A PARTIR D'UN CERTAIN RANG\n";
  cin >>sc1;cout <<"sc1 " <<sc1 <<"\n";
cin>>sc2;cout <<"sc2 " <<sc2 <<"\n";
cout <<"sc3" <<sc3 <<"\n";

cout << "8eme terme de sc1 " <<sc1(7) <<"\n";

cout << "somme des 10 premiers termes de sc1 " <<sc1.S(10)<<endl;
cout << "somme des 10 premiers termes de sc2 " <<sc2.S(10)<<endl;
cout << "somme des 10 premiers termes de sc3 " <<sc3.S(10)<<endl;

}
/*
SUITES ARITHMETIQUES
5 3
sa1 terme initial = 7  raison = 2
```


sa2 terme initial = 5 raison = 3

8eme terme de sa1 21

somme des 10 premiers termes de sa1 160

somme des 10 premiers termes de sa2 185

SUITES CONSTANTES A PARTIR D'UN CERTAIN RANG

rang

6

valeurs

7 5 3 4 8 9

valeur constante finale

1

sc1 (7 5 3 4 8 9 1 ...)

rang

2

valeurs

17

7

valeur constante finale

9

sc2 (17 7 9 ...)

sc3(5 ...)

8eme terme de sc1 1

somme des 10 premiers termes de sc1 40

somme des 10 premiers termes de sc2 96

somme des 10 premiers termes de sc3 50

*/