

EE2310 C++程式設計 HW2 (Ch 4,5)

Part 3. Programming

1. Internet Service Provider Part 1

```
#include<iostream>
#include<iomanip>
using namespace std;
int main(){
    char name[20],package;
    double time;
    cout<<"Please enter your name: ";
    cin>>name;
    do{
        cout<<"Which package did you purchase?(Enter A-C) ";
        cin>>package;
    } while (package != 'A'&&package != 'B'&&package != 'C');
    cout<<"how many hours did you used?(in hours) ";
    cin>>time;
    if(package=='A'){
        double amountA;
        if (time>5) amountA = 9.95+(time-5)*60*0.08;
        else amountA = 9.95;
        cout<<"User name: "<<setw(27)<<right<<name<<endl;
        cout<<"Usage hours: "<<setw(25)<<right<<time<<endl;
        cout<<"Total amount due: "<<setw(15)<<"$"<<right<<amountA<<endl;
    }

    else if(package=='B'){
        double amountB;
        if (time>10) amountB = 14.95+(time-10)*60*0.06;
        else amountB = 14.95;
        cout<<"User name: "<<setw(27)<<right<<name<<endl;
        cout<<"Usage hours: "<<setw(25)<<right<<time<<endl;
        cout<<"Total amount due: "<<setw(15)<<"$"<<right<<amountB<<endl;
    }

    else{
        const double amountC=19.95;
        cout<<"User name: "<<setw(27)<<right<<name<<endl;
        cout<<"Usage hours: "<<setw(25)<<right<<time<<endl;
        cout<<"Total amount due: "<<setw(15)<<"$"<<right<<amountC<<endl;
    }
    return 0;
}
```

C:\Users\User\Desktop\作業\C++HW2\1.exe

```
Please enter your name: Winnie
Which package did you purchase?(Enter A-C) 5
Which package did you purchase?(Enter A-C) C
how many hours did you used?(in hours) 5546
User name:                               Winnie
Usage hours:                             5546
Total amount due:                         $19.95
```

```
Process returned 0 (0x0)   execution time : 29.210 s
Press any key to continue.
```

2. Internet Service Provider Part 2

```
#include<iostream>
#include<iomanip>
using namespace std;
int main(){
    char name[20],package;
    double time;
    cout<<"To calculate how much money u can save:"<<endl;
    cout<<"Please enter your name: ";
    cin>>name;
    double amountA=0,amountB=0;
    const double amountC=19.95;
    do{
        cout<<"Which package did you purchase?(Enter A-C) ";
        cin>>package;
    } while (package != 'A'&&package != 'B'&&package != 'C');
    cout<<"how many hours did you used?(in hours) ";
    cin>>time;
    if (time>5) amountA = 9.95+(time-5)*60*0.08;
    else amountA = 9.95;
    if (time>10) amountB = 14.95+(time-10)*60*0.06;
    else amountB = 14.95;
    if(package=='A'){
        if (amountA>amountB){
            cout<<"You can save $"<<setw(10)<<left<<amountA-amountB<<" by choosing package B."<<endl;
        }
        if (amountA>amountC){
            cout<<"You can save $"<<setw(10)<<left<<amountA-amountC<<" by choosing package C."<<endl;
        }
    }
    else if(package=='B'){
        if (amountB>amountC){
            cout<<"You can save $"<<setw(10)<<left<<amountB-amountC<<" by choosing package C."<<endl;
        }
    }
    else{}
    return 0;
}
```

```
C:\Users\User\Desktop\作業\C++HW2\2.exe
To calculate how much money u can save:
Please enter your name: wen
Which package did you purchase?(Enter A-C) A
how many hours did you used?(in hours) 36
You can save $50.2      by choosing package B.
You can save $138.8    by choosing package C.

Process returned 0 (0x0)   execution time : 14.874 s
Press any key to continue.
```

3. Math Tutor Version 1

```
#include <iostream>
#include <iomanip>
#include <cstdlib>
#include <ctime>
using namespace std;
int main(){
    int min=10,max=50,ans;
    char flag;
    bool game=1;
    cout<<"Start practice of adding two numbers:"<<endl;
    do{
        srand( time(NULL) );
        int q1 = rand() % (max - min + 1) + min;
        int q2 = rand() % (max - min + 1) + min;
        cout<<" "<<q1<<endl;
        cout<<"+"<<q2<<endl;
        cout<<"____"<<endl<<" ";
        cin>>ans;
        if(ans==q1+q2) cout<<"~~~congratulations~~~"<<endl;
        else cout<<"!!! the correct answer is "<<q1+q2<<"!!!"<<endl;
        do{
            cout<<"Do you want to continue the practice? (Y/N) ";
            cin>>flag;
        }while(flag!='Y'&&flag!='N');
        if (flag=='N') game=0;
    }while(game);
    return 0;
}
```

```
C:\Users\User\Desktop\作業\C++HW2\3.exe
Start practice of adding two numbers:
24
+34
--
58
~~~congratulations~~~
Do you want to continue the practice? (Y/N) 6
Do you want to continue the practice? (Y/N) Y
36
+50
--
87
!!! the correct answer is 86!!!
Do you want to continue the practice? (Y/N) N

Process returned 0 (0x0)   execution time : 28.191 s
Press any key to continue.
```

4. Math Tutor Version 2

```

3.cpp x *4.cpp x
#include <ctime>
using namespace std;
int choice;
int ans;
bool game=1;
int main () {
    do {
        const int min=10,max=50;
        srand( time(NULL) );
        int q1 = rand() % (max - min + 1) + min;
        int q2 = rand() % (max - min + 1) + min;
        cout<<"MENU"<<endl<<"Choose whichever u want to practice: "<<endl
        <<"1. addition"<<endl
        <<"2. subtraction"<<endl
        <<"3. multiplication"<<endl
        <<"Or choose 4 to exit"<<endl;
        cin>>choice;
        if(choice<=0&&choice>4) cout<<"Error!"<<endl;
        switch(choice){
            case 1:
                cout<<"Start practice of adding two numbers:"<<endl;
                cout<<" "<<q1<<endl;
                cout<<"+"<<q2<<endl;
                cout<<"_"<<endl<<" ";
                cin>>ans;
                if(ans==q1+q2) cout<<"~~~~~congratulations~~~~~"<<endl;
                else cout<<"!!! the correct answer is "<<q1+q2<<"!!!"<<endl;
                break;
            case 2:
                cout<<"Start practice of subtracting two numbers:"<<endl;
                cout<<" "<<q1<<endl;
                cout<<"-"<<q2<<endl;
                cout<<"_"<<endl<<" ";
                cin>>ans;
                if(ans==q1-q2) cout<<"~~~~~congratulations~~~~~"<<endl;
                else cout<<"!!! the correct answer is "<<q1-q2<<"!!!"<<endl;
                break;
            case 3:
                cout<<"Start practice of multiplying two numbers:"<<endl;
                cout<<" "<<q1<<endl;
                cout<<"*"<<q2<<endl;
                cout<<"_"<<endl<<" ";
                cin>>ans;
                if(ans==q1*q2) cout<<"~~~~~congratulations~~~~~"<<endl;
                else cout<<"!!! the correct answer is "<<q1*q2<<"!!!"<<endl;
                break;
            case 4:
                game=0;
                break;
        }
    }while((choice<=0&&choice>4)||game);

    return 0;
}

```

C:\Users\User\Desktop\作業\C++HW2\4.exe

```

MENU
Choose whichever u want to practice:
1. addition
2. subtraction
3. multiplication
Or choose 4 to exit
5
MENU
Choose whichever u want to practice:
1. addition
2. subtraction
3. multiplication
Or choose 4 to exit
1
Start practice of adding two numbers:
 30
+42
-----
 72
~~~~~congratulations~~~~~
MENU
Choose whichever u want to practice:
1. addition
2. subtraction
3. multiplication
Or choose 4 to exit
2
Start practice of subtracting two numbers:
 25
-35
-----

```

C:\Users\User\Desktop\作業\C++HW2\4.exe

```

Start practice of subtracting two numbers:
 25
-35
-----
 -10
!!! the correct answer is -10!!!
MENU
Choose whichever u want to practice:
1. addition
2. subtraction
3. multiplication
Or choose 4 to exit
3
Start practice of multiplying two numbers:
 35
*45
-----
1575
!!! the correct answer is 1575!!!
MENU
Choose whichever u want to practice:
1. addition
2. subtraction
3. multiplication
Or choose 4 to exit
4

```

Process returned 0 (0x0) execution time : 34.307 s
Press any key to continue.

5. Diamond Display

```

1  #include<iostream>
2  using namespace std;
3  char a[7][8]={};
4  //1 3 5 7 5 3 1 a[i][j]
5  int main(){
6      int d=1;
7      for(int i=0;i<7;i++){
8          for(int j=0;j<8;j++){
9              a[i][j]='+';
10             if (j==7) a[i][j]='\n';
11             else if (!(i%6)&&j!=0) a[i][j]=' ';
12             else if (i%2&&j>2&&i!=3) a[i][j]=' ';
13             else if (i%3&&j>4) a[i][j]=' ';
14         }
15     }
16     for(int i=0;i<7;i++){
17         for (int j=0;j<8;j++){
18             cout<<a[i][j];
19         }
20     }
21     return 0;
22 }

```

Output:

```

+
+++
+++++
+++++++
+++++
+++
+
Process returned 0 (0x0)
execution time : 0.052 s
Press any key to continue.

```

6. Compute mathematical constant e

```

1  #include <iostream>
2  using namespace std;
3  double term(int N){
4      if(N>=1) return term(N-1)/N;
5      else return 1;
6  }
7  int main(){
8      int i=1;  bool N=1;
9      double result=0,L,Q;
10     float limit;
11     cout<<"Please enter a small (floating-point) number: ";
12     cin>>limit;
13     for(i=0;N;i++){
14         L=term(i);
15         if (i==0) cout<<"e = ";
16         if (L>=limit) {
17             if (i==0){
18                 cout<<"1 + ";
19                 result+=L;
20                 continue;
21             }
22             cout<<" + ";
23             if (i%10==0&&i) cout<<"    "<<endl;
24             result+=L;
25         }
26         else {
27             N=0;
28             cout<<" = "<<result<<endl;
29         }
30         L=term(++i); //check if there exists next term and print +
31         if (L>=limit){
32             cout<<" + ";
33             i--;
34         }
35     }
36     return 0;
37 }

```

Output:

```

C:\Users\User\Desktop\作業\C++HW2\6new.exe
Please enter a small (floating-point) number: 0.001
e = 1 + 1/1! + 1/2! + 1/3! + 1/4! + 1/5! + 1/6! = 2.71806
Process returned 0 (0x0)  execution time : 4.467 s
Press any key to continue.

```