

## 程式: poisson.cpp

```
//模擬卜松隨機變數

#include <iostream>
#include <cmath>
#include "urnd.cpp"

using std:: cin;
using std:: cout;
using std:: endl;

int poisson(float);

main()
{
    int i, n, seed, s=0;
    float lambda;

    cout << "\n輸入模擬的次數: ";
    cin >> n;
    cout << "\n輸入種子: ";
    cin >> seed;
    cout << "\n輸入參數: ";
```

```
    cin >> lambda;

    for (i=1; i<=n; ++i)
    {
        s=s+poisson(lambda);
    }
    cout << "\n平均值爲 "
    << (float) s/n << endl;

    system("pause");
}

int poisson(float lambda)
{
    int i, k;
    float s=0, f=1, cdf=0, r, pk;
    float u;

    k=lambda;
    r=1/lambda;

    for(i=1; i<=k; ++i)
    {
        s=s+log(i);
```

```
        f=f*(k+1-i)*r;
        cdf=cdf+f;
    }
    pk=exp(-lambda+k*log(lambda)-s);
    cdf=(cdf+1)*pk;
    u=urnd();
    if (u<cdf)
    {
        A:
        cdf=cdf-pk;
        if (u>=cdf) goto C;
        pk=k*r*pk;
        --k;
        goto A;
    }
    else
    {
        B:
        ++k;
        pk=lambda*pk/k;
        cdf=cdf+pk;
        if (u<cdf) goto C;
        goto B;
    }
    C:
    return k;
}
```