Subject: Re: Curve Fitting to timeseries using a set of 8 sine and cosine functions
Posted by siumtesfai on Sat, 25 Oct 2014 17:51:02 GMT
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Thank You for spending some time to help me. ..

Sorry If I post the same question again and again. I just need a solution for my problem.

I have attempted to use multiple linear regression to solve the problem . However, when I plot the original data with fitted value , I did not find good result.

I think it is better I put sampedata which I understand instead of using random numbers

Here is sample data (sampledata.txt)

8.82609
8.50000
7.52174
6.20833
8.11111
10.4000
8.39286
9.19231
7.30769
9.13043
7.57692
8.00000
10.9600
8.33333
8.90476
10.8750
10.6250
10.2069
10.0000
11.7391
10.6538
11.8500
8.68000
8.96296
6.72727
7.56522
7.47826
7.96296
9.03846
9.19231
8.81818
7.08333

8.69565
8.75000
8.55556
8.28000
8.68000
7.87500
7.71429
7.78261
6.85714
9.11111
6.46154
6.92593
6.77778
6.50000
7.38889
8.81818
5.45455
4.72727
5.04348
5.75000
6.60870
5.91304
6.71429
7.33333
7.21739
6.54545
6.62500
5.94737
6.72000
7.28000
7.82353
7.50000
8.80952
9.59091
8.04348
7.44444
6.80000
8.55556
12.5556
6.47368
7.41176
7.80000
7.68750
7.31579
7.31579
8.37500
7.00000
9.88235

9.42105
9.41177
7.53333
6.70588
9.30000
8.66667
9.26316
11.4091
7.35000
9.16667
8.09091
8.84210
7.05000
8.85000
8.32000
8.66667
7.25000
6.77778
6.15000
8.70588
7.52381
7.91304
7.33333
6.64706
7.26316
7.95238
7.00000
7.45000
7.30769
11.0000
12.8750
8.18182
11.8182
9.09091
10.3750
11.0833
11.7333
12.7857
11.1667
12.5833
7.76190
6.06667
6.28571
6.00000
9.76190
8.62500
6.31579
6.00000

9.20000
9.47059
9.42857
8.05882
9.56522
9.30435
9.80000
8.42857
8.65000
8.44444
8.56522
6.83333
9.52381
9.11539
8.00000
6.42857
9.36364
8.80000
9.02308
7.90909
7.95455
8.54091
8.55556
7.95652
10.8621
5.80000
8.84167
8.34615
7.16000
6.47619
6.95238
6.76190
6.48571
9.95833
7.65217
6.86500
8.16000
7.57619
7.68182
7.04762
8.77727
7.82917
8.96923
7.52174
8.82083
7.59583
8.23810
8.60476

9.22609
7.86522
10.1083
8.26667
8.68095
10.4632
8.23333
7.85217
6.85455
7.24444
7.56522
7.28947
7.33000
8.97369
7.84500
9.40000
5.55882
7.30870
6.39500
8.12000
8.42222
7.87917
6.90625
7.46000
6.22632
7.98667
7.96842
6.99474
10.9944
8.29474
8.40417
7.93637
8.67727
7.49444
7.61923
8.04000
8.12857
9.06667
9.45500
10.1833
10.6923
11.3458
12.0952
10.7346
10.3429
9.97391
8.39091
7.49565

8.06538
8.71200
8.90952
9.08750
9.18077
10.5808
8.29524
9.22727
8.22857
7.56500
7.26087
7.86667
10.1913
9.27693
7.83044
7.21818
7.41053
7.91923
8.43077
8.37500
9.40417
7.23684
6.79444
8.24348
7.19259
7.90400
8.15000
7.40000
6.35455
7.39500
8.88261
7.66522
9.07143
8.88750
7.27917
8.92917
8.28333
7.74231
7.47600
6.93182
7.92609
8.21379
7.89286
7.80000
6.84800
7.63200
7.78333
7.65600

7.46786
7.10000
7.59600
7.13750
9.67000
13.1400
12.3037
11.5038
11.5087
10.2235
8.43158
8.12273
10.2700
8.30417
10.5952
9.98800
7.63200
8.22692
9.49167
7.63333
7.48333
9.22917
9.34643
7.10000
8.17692
7.15417
5.82174
8.90800
8.01600
7.42381
8.43333
9.04074
8.56923
8.25200
8.60741
8.19655
11.4400
7.57500
8.35000
9.83478
10.4069
11.1704
12.8808
10.3091
13.2364
10.8391
10.5560
10.4704

11.1767
9.77143
11.1520
10.9652
9.19643
9.11539
11.3667
11.0444
10.6370
10.8714
9.14231
10.4385
11.0593
10.5760
9.15000
10.0231
8.59615
9.68461
9.26000
7.51852
7.21923
8.53333
10.0133
9.27857
7.65000
9.12143
10.1560
7.86400
8.10385
7.89231
10.0600
8.06667
7.19643
6.87308
6.98800
7.14074
6.91429
8.03333
7.32174
7.67200
9.14444
8.24400
10.1148
11.3731
10.5138
9.80000
9.10800
7.65556

7.36667
7.42500
6.92308
7.96923
8.80000
10.3250
9.53929
9.77308
9.78929
10.2077
9.06154
8.71538
8.67143
9.41923
8.90000
9.44400
7.64231
9.06000
8.14445
9.87917
9.49167
9.74615
8.74231
9.73214
10.1400
9.63214
9.23462
8.83043
8.54615
8.53333
7.62308
8.65357
9.45000
9.02759
8.82857
8.54231
9.37857
9.84815
10.6966
10.3143

```
file='sampledata.txt'
readcol,file,input

pro funcname,input=input,scycle=scycle,X1=X1,X9=X9
```

```
n=n_elements(input)
scycle=fltarr(n)+1E20
X1=fltarr(n)+1E20
X2=fltarr(n)+1E20
X3=fltarr(n)+1E20
X4=fltarr(n)+1E20
X5=fltarr(n)+1E20
X6=fltarr(n)+1E20
X7=fltarr(n)+1E20
X8=fltarr(n)+1E20
X9=fltarr(n)+1E20
tmpX9=(findgen(n)+1)/12.
t=findgen(n)+1

dependvar=fltarr(n)
pi=!PI*1.0

clean=where(input LT 1000 and input NE 0)

if clean(0) GE 0 and n_elements(clean) GE 0.9*n_elements(clean) then begin

for i=0,n_elements(clean)-1 do begin

  g=clean(i)

  dependvar(g)=input(g)

     angle=(2*pi*t(g))/12.

     X1(g)=sin(angle)
     X2(g)=cos(angle)
     X3(g)=sin(2*angle)
     X4(g)=cos(2*angle)
     X5(g)=sin(3*angle)
     X6(g)=cos(3*angle)
     X7(g)=sin(4*angle)
     X8(g)=cos(4*angle)
     X9(g)=tmpX9(g)

endfor




X = [TRANSPOSE(X1), TRANSPOSE(X2), TRANSPOSE(X3),$
  TRANSPOSE(X4),TRANSPOSE(X5), TRANSPOSE(X6),$
  TRANSPOSE(X7), TRANSPOSE(X8),TRANSPOSE(X9)]
```

```
  weights = REPLICATE(1.0, n) ; Create an Npoints-element vector of uniform weights.


   coeffs=regress(X(*,clean),dependvar(clean),weights(clean),SI GMA=sigma, CONST=const, $
   MEASURE_ERRORS=measure_errors,yfit=yfit, /RELATIVE_WEIGHT)
print,'multiple linear regression coeffs'
print,coeffs
print,'slope'
print,coeffs[8]
print,yfit
constv=fltarr(n)
constv(*)=const
FOR k=0,n_elements(clean)-1 do begin

   j=clean(k)
    scycle(j)= coeffs(0)*X1(j)+coeffs(1)*X2(j)+ $
      coeffs(2)*X3(j)+coeffs(3)*X4(j)+ $
      coeffs(4)*X5(j)+coeffs(5)*X6(j)+ $
      coeffs(6)*X7(j)+coeffs(7)*X8(j)+constv(j)+coeffs(8)*X9(j)

  ENDFOR ; j loop


endif else begin
   dependvar(*)=1E20
      X1(*)=1E20
      X2(*)=1E20
      X3(*)=1E20
      X4(*)=1E20
      X5(*)=1E20
      X6(*)=1E20
      X7(*)=1E20
      X8(*)=1E20
      X9(*)=1E20
  scycle(*)=1E20
  endelse

;print,X1
print,'number of X1'
print,n_elements(X1)
print,const


;=========================
;   plot to check the result
;=========================
```

```
xaxis=findgen(n_elements(input))

cgplot,xaxis, input ,color =cgcolor('black')  ;  orignial data
oplot,xaxis, scycle,color = cgcolor('blue')   ;  fitted


END
```