```
>>gp=rungp(@Y6_config);
Press a key to continue


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GPTIPS 2
Symbolic data mining platform for MATLAB
Copyright (C) Dominic Searson 2009-2015

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Run parameters
--------------
Population size:         100
Number of generations:   100
Number of runs:          1
Parallel mode :          off
Tournament type:         regular
Tournament size:         15
Elite fraction:          0.3
Fitness cache:           enabled
Lexicographic selection: True
Max tree depth:          4
Max nodes per tree:      Inf
Using function set:      TIMES MINUS PLUS
Number of inputs:        3
Max genes:               12
Constants range:         [-10  10]
Complexity measure:      expressional
Fitness function:        regressmulti_fitfun.m

Generation 0
Best fitness:    4434.7632
Mean fitness:    9742.5532
Best complexity: 223
Inputs in best individual: x1 x2 x3

Generation 10
Best fitness:    3731.0443
```

```
Mean fitness:    3979.6917
Best complexity: 313
Inputs in best individual: x1 x2 x3

Generation 20
Best fitness:    3555.9332
Mean fitness:    3830.4868
Best complexity: 333
Inputs in best individual: x1 x2 x3

Generation 30
Best fitness:    3466.7842
Mean fitness:    3794.4739
Best complexity: 333
Inputs in best individual: x1 x2 x3

Generation 40
Best fitness:    3397.3801
Mean fitness:    3699.8031
Best complexity: 325
Inputs in best individual: x1 x2 x3

Generation 50
Best fitness:    3112.9686
Mean fitness:    3515.1327
Best complexity: 331
Inputs in best individual: x1 x2 x3

Generation 60
Best fitness:    2875.3146
Mean fitness:    3279.8461
Best complexity: 339
Inputs in best individual: x1 x2 x3

Generation 70
Best fitness:    2859.5755
Mean fitness:    3208.6009
Best complexity: 337
Inputs in best individual: x1 x2 x3

Generation 80
Best fitness:    2840.7434
Mean fitness:    3344.1004
Best complexity: 339
Inputs in best individual: x1 x2 x3

Generation 90
Best fitness:    2784.0224
Mean fitness:    3313.3398
Best complexity: 331
Inputs in best individual: x1 x2 x3
```

```
Finalising run.
GPTIPS run complete in 0.87 min.
Best fitness acheived: 2781.561
------------------------------------------------------------

Evaluate the best individual of
the runs on the fitness function using:
>>runtree(gp,'best');
Press a key to continue


Next, use the the GPPRETTY command on the best individual:
>>gppretty(gp,'best')
Press a key to continue


Simplified genes
----------------

Gene 1 and bias term

  13322.0 - 2988.0 x1 x2 (x1 - 1.0 x3 + 3.237)

Gene 2

  8763.0 x2 + 8763.0 x1 (x1 + x2)

Gene 3

  -3271.0 x1 (x2 + 1.0) (x3 - 1.0 x1 + x1 x3)

Gene 4

  132110.0 x3 (x1 + x3) - 132110.0 x1

Gene 5

  146000.0 x1

Gene 6

  2.787 (x2 + x3) (x1 - 1.0 x3) (x1 - 1.0 x2 + x1 x2)

Gene 7

  11844.0 x1 x2 x3

Gene 8

  -4543.0 x3 (x1 + x2 + x2 x3)
```

```
Gene 9

            2
  - 17.07 x2  x3 (x1 - 1.0)

Gene 10

  -312440.0 x3 (x1 - 1.0 x3)

Gene 11

  - 16844.0 x1 - 8418.0 x2 - 8418.0 x3

Simplified overall GP expression
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          2   2            2                  2               2                 2
  2.787 x1  x2  - 3268.0 x1  x2 x3 + 286.3 x1  x2 - 3268.0 x1  x3 + 12033.0 x1  -

               2                 2                 2
     19.86 x1 x2  x3 - 2.787 x1 x2  - 2.787 x1 x2 x3  + 11577.0 x1 x2 x3 - 907.8 x1 x2 -

               2                                        2                 2
     2.787 x1 x3  - 188110.0 x1 x3 - 2998.0 x1 + 19.86 x2  x3 - 4540.0 x2 x3  -

                                          2
     4543.0 x2 x3 + 344.5 x2 + 444770.0 x3  - 8418.0 x3 + 13322.0

Next, use the the DRAWTREE command:
>>drawtrees(gp,'best')
Press a key to continue

Trees drawn to trees.htm
Opening in system browser.

Finally, an HTML report listing the models on the Pareto optimal front
of model expressional complexity and performance can be generated using
the PARETOREPORT function.
>>paretoreport(gp)

Press a key to continue

100 models passed R^2 training (>= 0) and expressional complexity (<= Inf) filter ...
Computing pareto front on training data...
Removing genotype duplicates from 7 remaining models ...
6 models passed the filtering process.
Model report created in pareto.htm
Opening report in system browser.
end
>>
```