GPTIPS tree structure report
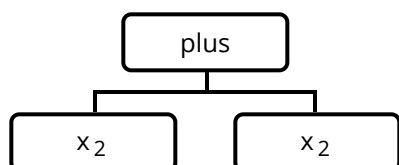
For best model on training data.

26-Apr-2019 15:37:53
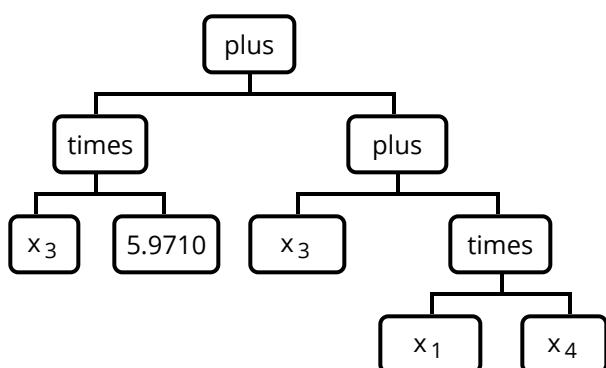
Tree 1

nodes = 3 depth = 2 complexity = 5
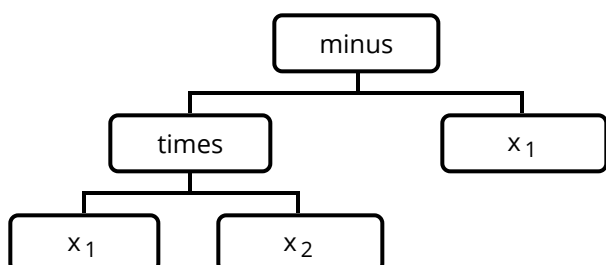
```
        ┌────────┐
        │  plus  │
        └────────┘
       ┌──────┴──────┐
   ┌───────┐     ┌───────┐
   │  x_2  │     │  x_2  │
   └───────┘     └───────┘
```

Tree 2

nodes = 9 depth = 4 complexity = 25

```
              ┌───────┐
              │  plus │
              └───────┘
         ┌───────┴───────────┐
     ┌───────┐           ┌───────┐
     │ times │           │  plus │
     └───────┘           └───────┘
      ┌───┴────┐         ┌───┴──────┐
  ┌──────┐ ┌────────┐ ┌──────┐  ┌───────┐
  │ x_3  │ │ 5.9710 │ │ x_3  │  │ times │
  └──────┘ └────────┘ └──────┘  └───────┘
                                 ┌───┴────┐
                              ┌──────┐ ┌──────┐
                              │ x_1  │ │ x_4  │
                              └──────┘ └──────┘
```

Tree 3

nodes = 5 depth = 3 complexity = 11

```
              ┌────────┐
              │  minus │
              └────────┘
         ┌───────┴───────────┐
     ┌────────┐          ┌───────┐
     │  times │          │  x_1  │
     └────────┘          └───────┘
      ┌───┴────┐
  ┌──────┐ ┌──────┐
  │ x_1  │ │ x_2  │
  └──────┘ └──────┘
```

Tree 4

nodes = 9 depth = 4 complexity = 25

```
                    times
          times              minus
       x₁      x₂        minus      x₁
                      x₃      x₁
```

$$\text{times} \begin{cases} \text{times}\begin{cases} x_1 \\ x_2 \end{cases} \\ \text{minus}\begin{cases} \text{minus}\begin{cases} x_3 \\ x_1 \end{cases} \\ x_1 \end{cases} \end{cases}$$
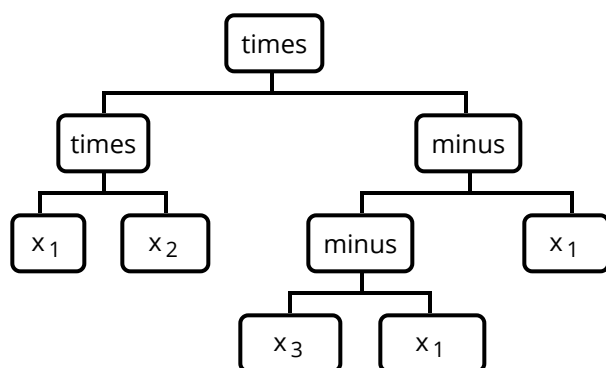
Tree 5

nodes = 13 depth = 4 complexity = 41

```
                      times
            plus                  plus
       plus      times      minus      -1.050
    -1.050  x₁  x₄   x₂    x₃   x₁
```
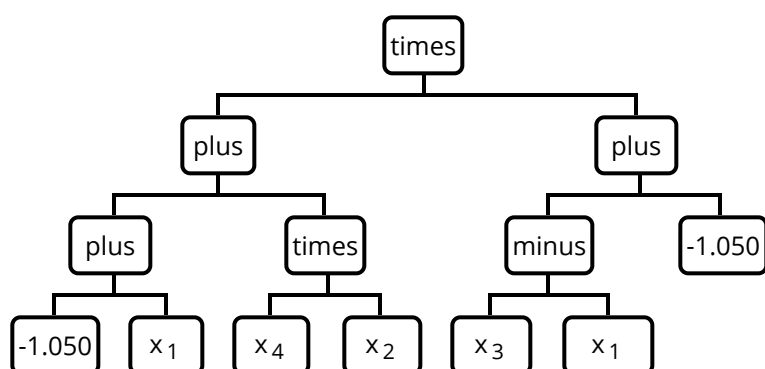
Tree 6

nodes = 7 depth = 3 complexity = 17

```
                  times
          times            plus
       x₂     x₁        x₂      x₂
```

Tree 7

nodes = 7 depth = 3 complexity = 17

```
                    plus
        ┌────────────┴────────────┐
      plus                      minus
   ┌────┴────┐              ┌─────┴─────┐
  x₂        x₃            x₄          x₁
```
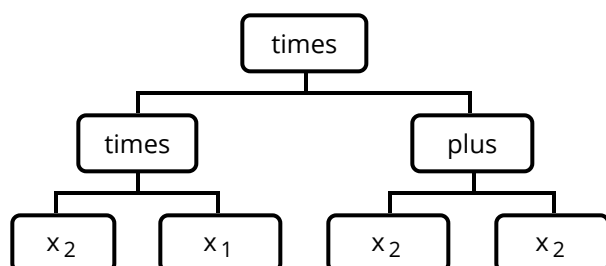
Tree 8

nodes = 13 depth = 4 complexity = 41
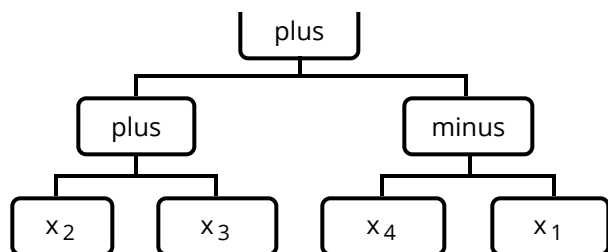
```
                        times
            ┌─────────────┴─────────────┐
          plus                        plus
      ┌─────┴─────┐              ┌──────┴──────┐
    plus        times         minus        -1.050
  ┌──┴──┐     ┌──┴──┐       ┌───┴───┐
 x₂    x₃    x₄    x₂      x₃      x₁
```

Tree 9

nodes = 9 depth = 4 complexity = 25

```
                    minus
        ┌────────────┴────────────┐
      times                     minus
   ┌────┴────┐             ┌──────┴──────┐
  x₄        x₂         -2.492          times
                                     ┌───┴───┐
                                    x₃      x₂
```
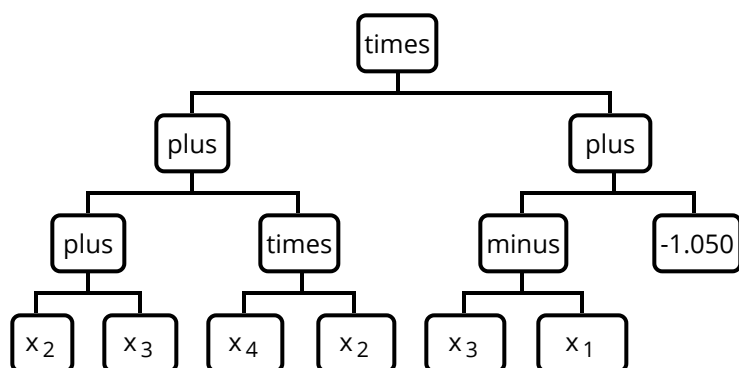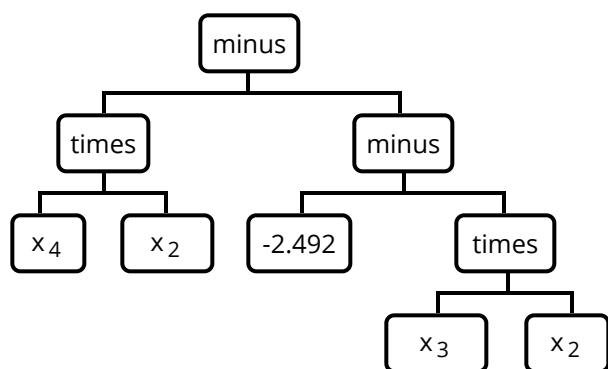
Tree 10

nodes = 7 depth = 3 complexity = 17

```
                    plus
        ┌────────────┴────────────┐
      plus                      times
```

x_4 x_2 x_1 x_1
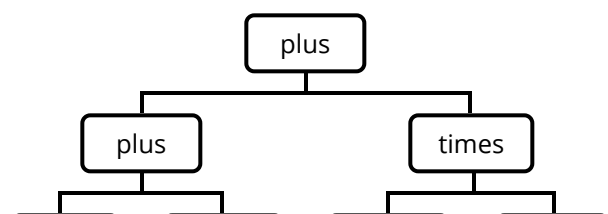
Tree 11

nodes = 11 depth = 4 complexity = 33

```
              minus
         ┌──────┴──────┐
       times          plus
    ┌────┴────┐     ┌───┴────┐
   x_3      times  x_1     times
          ┌──┴──┐        ┌──┴──┐
         x_4   x_2      x_1   x_1
```
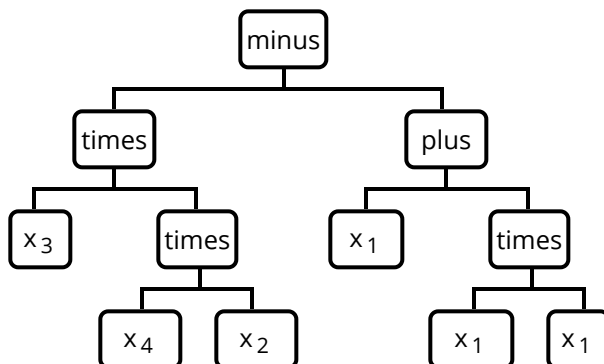
Tree 12

nodes = 9 depth = 4 complexity = 27

```
        times
     ┌────┴──────────┐
    x_4            minus
            ┌────────┴────────┐
          times             times
        ┌──┴──┐           ┌───┴────┐
       x_4   x_2         x_3    5.9710
```
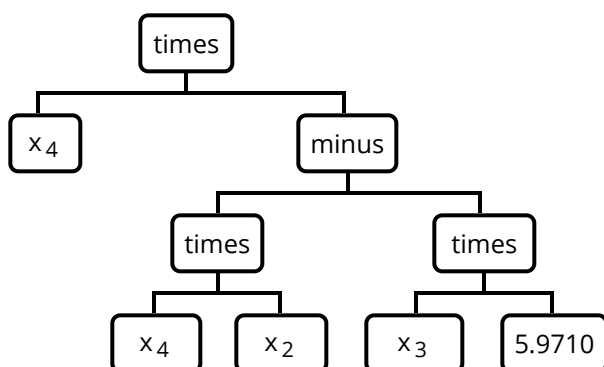
GPTIPS - the symbolic data mining platform for MATLAB

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