```
{
    "name": "Happy Fish Library With Copula Stored in CSV File",
    "objectType": "sipModel",
    "libraryType": "SIPmath_3_0",
    "dateCreated": "2021-20-03",
    "version": "0",
    "provenance": "DGE SLS",
    "PM_Trials": 1000,
    "U01": {
        "rng": [
            {
                "name": "indexRng",
                "function": "Index",
                "arguments": {
                    "counter": "PM_Index"
                }
            }
        ],
        "copula": [
            {
                "name": "HappyCopulaLib",
                "function": "SIP_Array",
                "arguments": {
                    "type": "csv",
                    "url": "https://sipmath.network/libraries/HappyCopulaSimple.c
sv",
                    "value": [
                        "HapCopula",
                        "PyCopula"
                    ]
                },
                "copulaLayer": [
                    "HapCopula",
                    "PyCopula"
                ]
            }
        ]
    },
    "sips": [
        {
            "name": "Steelhead1",
            "ref": {
                "source": "copula",
                "name": "HappyCopulaLib",
                "copulaLayer": "HapCopula"
```

U01 section refers to a uniform random variable on 0 to 1.

rng stands for random number generator, which in this case is named “indexRng” and is an Index function.

The argument of the indexRNG is the Monte Carlo iteration counter (“PM_Index”).

The Copula consists of a SLURP of two interrelated SIPs stored in a csv file. This Copula was based on the scatter plot of a Happy Face

The SIPs section starts here. This example has two SIPs joined through the copula.

This SIP is named “Steelhead1” and is driven by a U01 in the copula layer named “HapCopula”.

```
},
"function": "Metalog_1_0",
"arguments": {
    "lowerBound": 2,
    "aCoefficients": [
        2.058955983,
        -2.281157829,
        -1.513012712,
        10.042285460,
        4.898678377,
        13.055783020,
        -32.701452370,
        5.303664167,
        -15.338680840,
        -13.912132650
    ]
},
"metadata": {
    "Average": 10.1244918,
    "Trial1": 10.4413037681972,
    "Trial2": 9.96709008630459,
    "Trial3": 10.2471838687802,
    "density": [
        0.000000000,
        0.009411357,
        0.064517460,
        0.075300228,
        0.070537529,
        0.078305788,
        0.109189176,
        0.139477609,
        0.088129388,
        0.059900505,
        0.042843555,
        0.029680524,
        0.020151553,
        0.013942071,
        0.009942102,
        0.007356791,
        0.005664696,
        0.004366737,
        0.003521197,
        0.002675658,
        0.002144864,
        0.001687803,
```


The function is a Metalog 1.0 (current formulation of the Metalog).

The arguments are the “a” coefficients and the lower bound.

Metadata includes the Average and three specific trials for calibration. In addition, Density data is included for creating a line graph of the density function.

```
                0.001303557,
                0.000973593,
                0.000657581
            ]
        }
    },
    {
        "name": "Steelhead2",
        "ref": {
            "source": "copula",
            "name": "HappyCopulaLib",
            "copulaLayer": "PyCopula"
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        "function": "Metalog_1_0",
        "arguments": {
            "lowerBound": 2,
            "aCoefficients": [
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                4.898678377,
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                -32.701452370,
                5.303664167,
                -15.338680840,
                -13.912132650
            ]
        },
        "metadata": {
            "Average": 10.1244918,
            "Trial1": 11.2543057323368,
            "Trial2": 26.0663095769058,
            "Trial3": 3.91094809755693,
            "density": [
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                0.009411357,
                0.064517460,
                0.075300228,
                0.070537529,
                0.078305788,
                0.109189176,
                0.139477609,
                0.088129388,
                0.059900505,
```

```
                    0.042843555,
                    0.029680524,
                    0.020151553,
                    0.013942071,
                    0.009942102,
                    0.007356791,
                    0.005664696,
                    0.004366737,
                    0.003521197,
                    0.002675658,
                    0.002144864,
                    0.001687803,
                    0.001303557,
                    0.000973593,
                    0.000657581
                ]
            }
        }
    ]
}
```