```
pip install orange3
```

```
Collecting orange3
  Downloading Orange3-3.29.3-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64.whl (25.3 MB)
     |████████████████████████████████| 25.3 MB 95 kB/s
Requirement already satisfied: setuptools>=36.3 in /usr/local/lib/python3.7/dist-packages (from orange3) (57.4.0)
Collecting xlsxwriter
  Downloading XlsxWriter-3.0.1-py3-none-any.whl (148 kB)
     |████████████████████████████████| 148 kB 57.2 MB/s
Requirement already satisfied: pyyaml in /usr/local/lib/python3.7/dist-packages (from orange3) (3.13)
Requirement already satisfied: networkx in /usr/local/lib/python3.7/dist-packages (from orange3) (2.6.2)
Requirement already satisfied: numpy>=1.16.0 in /usr/local/lib/python3.7/dist-packages (from orange3) (1.19.5)
Collecting serverfiles
  Downloading serverfiles-0.3.1.tar.gz (11 kB)
Collecting AnyQt>=0.0.11
  Downloading AnyQt-0.0.13-py3-none-any.whl (47 kB)
     |████████████████████████████████| 47 kB 4.3 MB/s
Requirement already satisfied: pip>=9.0 in /usr/local/lib/python3.7/dist-packages (from orange3) (21.1.3)
Collecting pyqtgraph>=0.11.1
  Downloading pyqtgraph-0.12.2-py3-none-any.whl (959 kB)
     |████████████████████████████████| 959 kB 41.7 MB/s
Collecting orange-canvas-core<0.2a,>=0.1.21
  Downloading orange_canvas_core-0.1.22-py3-none-any.whl (489 kB)
     |████████████████████████████████| 489 kB 55.9 MB/s
Collecting httpx<0.17,>=0.14.0
  Downloading httpx-0.16.1-py3-none-any.whl (65 kB)
     |████████████████████████████████| 65 kB 3.7 MB/s
Collecting keyrings.alt
  Downloading keyrings.alt-4.1.0-py3-none-any.whl (20 kB)
Requirement already satisfied: scipy>=0.16.1 in /usr/local/lib/python3.7/dist-packages (from orange3) (1.4.1)
Requirement already satisfied: pandas>=1.0.0 in /usr/local/lib/python3.7/dist-packages (from orange3) (1.1.5)
Requirement already satisfied: joblib>=0.9.4 in /usr/local/lib/python3.7/dist-packages (from orange3) (1.0.1)
Requirement already satisfied: openpyxl in /usr/local/lib/python3.7/dist-packages (from orange3) (2.5.9)
Requirement already satisfied: python-louvain>=0.13 in /usr/local/lib/python3.7/dist-packages (from orange3) (0.15)
Requirement already satisfied: bottleneck>=1.0.0 in /usr/local/lib/python3.7/dist-packages (from orange3) (1.3.2)
Collecting PyQt5!=5.15.1,>=5.12
  Downloading PyQt5-5.15.4-cp36.cp37.cp38.cp39-abi3-manylinux2014_x86_64.whl (8.3 MB)
     |████████████████████████████████| 8.3 MB 37.6 MB/s
Requirement already satisfied: xlrd>=0.9.2 in /usr/local/lib/python3.7/dist-packages (from orange3) (1.1.0)
Collecting orange-widget-base>=4.13.0
```

```
  Downloading orange_widget_base-4.13.1-py3-none-any.whl (251 kB)
     |████████████████████████████████| 251 kB 62.5 MB/s
Collecting PyQtWebEngine>=5.12
  Downloading PyQtWebEngine-5.15.4-cp36.cp37.cp38.cp39-abi3-manylinux2014_x86_64.whl (229 kB)
     |████████████████████████████████| 229 kB 71.8 MB/s
Requirement already satisfied: chardet>=3.0.2 in /usr/local/lib/python3.7/dist-packages (from orange3) (3.0.4)
Collecting openTSNE>=0.6.0
  Downloading openTSNE-0.6.0-cp37-cp37m-manylinux2010_x86_64.whl (2.3 MB)
     |████████████████████████████████| 2.3 MB 70.8 MB/s
Collecting keyring
  Downloading keyring-23.2.1-py3-none-any.whl (33 kB)
Requirement already satisfied: requests in /usr/local/lib/python3.7/dist-packages (from orange3) (2.23.0)
Requirement already satisfied: matplotlib>=2.0.0 in /usr/local/lib/python3.7/dist-packages (from orange3) (3.2.2)
Requirement already satisfied: scikit-learn!=0.23.0,>=0.22.0 in /usr/local/lib/python3.7/dist-packages (from orange3) (0.22.2
Collecting baycomp>=1.0.2
  Downloading baycomp-1.0.2-py3-none-any.whl (17 kB)
Collecting httpcore==0.12.*
  Downloading httpcore-0.12.3-py3-none-any.whl (55 kB)
     |████████████████████████████████| 55 kB 3.2 MB/s
Collecting sniffio
```

```
import Orange
```

```
##Discretization
brown = Orange.data.Table("brown-selected.tab")
disc = Orange.preprocess.Discretize()
disc.method = Orange.preprocess.discretize.EqualFreq(n=3)
d_brown = disc(brown)

print("Original dataset:")
for e in brown[:3]:
    print(e)

print("Discretized dataset:")
for e in d_brown[:3]:
    print(e)
```

```
 Original dataset:
```

```
[?, -0.023, 0.057, 0.007, 0.018, -0.057, 0.009, -0.034, -0.016, -0.046, 0.060, -0.007, 0.007, -0.092, 0.057, -0.009, -0.009, -0
[-0.031, -0.031, -0.060, 0.037, -0.071, -0.018, -0.026, -0.052, 0.018, 0.052, 0.055, -0.026, -0.037, -0.084, -0.071, -0.016, -0
[-0.013, ?, 0.067, -0.025, 0.017, 0.008, -0.042, 0.013, 0.111, 0.015, 0.140, 0.065, -0.019, -0.031, -0.025, 0.084, -0.038, 0.01
Discretized dataset:
[?, -0.04150 - -0.00550, ≥ 0, -0.02950 - 0.0075, ≥ -0.00650, < -0.04050, -0.020 - 0.0115, < -0.027, < -0.00550, < -0.02150, ≥ 0
[< -0.01550, -0.04150 - -0.00550, < -0.029, ≥ 0.0075, < -0.03950, -0.04050 - -0.00150, < -0.020, < -0.027, -0.00550 - 0.0265, ≥
[-0.01550 - 0.0155, ?, ≥ 0, -0.02950 - 0.0075, ≥ -0.00650, ≥ -0.00150, < -0.020, -0.027 - 0.0145, ≥ 0.0265, ≥ 0.0095, ≥ 0.032,
```

```
#Continuization
titanic = Orange.data.Table("titanic")
continuizer = Orange.preprocess.Continuize()
titanic1 = continuizer(titanic)

print("Before Continuization:\n",titanic.domain)
print("After Continuization:\n",titanic1.domain)



#Look at specific data of row 10 in the table before and after continuization
print("10th row data before: ",titanic[10])
print("10th row data after: ",titanic1[10])
```

```
Before Continuization:
 [status, age, sex | survived]
After Continuization:
 [status=crew, status=first, status=second, status=third, age=adult, age=child, sex=female, sex=male | survived]
10th row data before:  [first, adult, male | yes]
10th row data after:  [0, 1, 0, 0, 1, 0, 0, 1 | yes]
```

```
#Normalization
from Orange.preprocess import Normalize
normalizer = Normalize(norm_type=Normalize.NormalizeBySpan)
normalized_data = normalizer(brown)
print("Before Normalization: ",brown[2])
print("After noramlization: ",normalized_data[2])
```

```
Before Normalization:  [-0.013, ?, 0.067, -0.025, 0.017, 0.008, -0.042, 0.013, 0.111, 0.015, 0.140, 0.065, -0.019, -0.031, -0.0
```

```
After noramlization:  [0.41061, ?, 0.71479, 0.46689, 0.78623, 0.66790, 0.33679, 0.60300, 0.92050, 0.61189, 1.000, 0.96154, 0.40
```

```
#Randomization
from Orange.preprocess import Randomize
randomizer = Randomize(Randomize.RandomizeClasses)
randomized_data = randomizer(brown)
print("Before Randomization: ",brown[2])
print("After Randomization: ",randomized_data[2])
```

```
Before Randomization:  [-0.013, ?, 0.067, -0.025, 0.017, 0.008, -0.042, 0.013, 0.111, 0.015, 0.140, 0.065, -0.019, -0.031, -0.0
After Randomization:  [-0.013, ?, 0.067, -0.025, 0.017, 0.008, -0.042, 0.013, 0.111, 0.015, 0.140, 0.065, -0.019, -0.031, -0.02
```

✓ 0s completed at 16:16