idss_selfstudy_numerical_i_ch_numpyreference

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Introduction to Data Science and Systems 2019-2020
Self-study: Arrays, numpy and vectorisaiton
Chapter: Appendix - NumPy Referenceű

#####
University of Glasgow - material prepared by John H. Williamson*; adapted to IDSS by BSJ.

$*arg min$

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[2]:
```
import IPython.display
IPython.display.HTML("""
<script>
  function code_toggle() {
    if (code_shown){
      $('div.input').hide('500');
      $('#toggleButton').val('Show Code')
    } else {
      $('div.input').show('500');
      $('#toggleButton').val('Hide Code')
    }
    code_shown = !code_shown
  }

  $( document ).ready(function(){
    code_shown=false;
    $('div.input').hide()
  });
</script>
<form action="javascript:code_toggle()"><input type="submit" id="toggleButton"␣
 ↪value="Show Code"></form>""")
```

[2]: `<IPython.core.display.HTML object>`

0.0.1 NumPy reference

In IDSS we will make extensive use of the following NumPy functions/functionality. You should know what these functions do and be ready to use them by the end of the first two weeks.

These are all covered in the NumPy API reference

- multidimensional slicing syntax `x[1,2:5]`
- broadcasting arithmetic `x+4`
- slice assignment `x[0:5] = 1`
- boolean indexing `x[[True, False, False]]`
- fancy indexing `x[y] += 1`

0.0.2 Generation

- np.loadtxt
- np.savetxt
- np.zeros
- np.ones
- np.full
- np.zeros_like
- np.arange
- np.linspace
- np.array
- np.meshgrid

0.0.3 Logical

- np.logical_and
- np.logical_or
- np.logical_not

0.0.4 Reductions

- np.any
- np.all
- np.prod
- np.min
- np.max
- np.sum
- np.mean
- np.std

0.0.5 Accumulations

- np.cumprod
- np.cumsum
- np.diff
- np.gradient

0.0.6 Random

- np.random.uniform
- np.random.normal
- np.random.randint

0.0.7 Reshaping

- np.tile
- np.rot90
- np.transpose and x.T
- np.fliplr
- np.flipud
- np.stack
- np.concatenate
- np.squeeze
- np.reshape
- np.einsum
- np.ravel
- np.swapaxes

0.0.8 Floating point handling

- np.isinf
- np.isnan
- np.nan
- np.inf
- np.allclose
- np.frexp

0.0.9 Index finding and sorting

- np.argmin
- np.argmax
- np.argsort
- np.sort
- np.nonzero
- np.where

0.0.10 Standard functions (ufuncs)

- np.minimum, np.maximum (elementwise min/max)

- np.log, np.exp, np.sin, np.cos, np.tan, np.arcsin, np.arccos, np.tanh, etc.

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