Pensieve header: January 27: Textbook (EIWL) chapters 9-12, unevaluated.

9. Interactive Manipulation

```
Manipulate[Table[Orange, n], {n, 1, 5, 1}]

Table[Table[Orange, n], {n, 1, 5, 1}]

Manipulate[Column[{n, n^2, n^3}], {n, 1, 10, 1}]

Table[Column[{n, n^2, n^3}], {n, 1, 10, 1}]

Manipulate[Column[{n, n^2, n^3}], {n, 1, 10}]

Manipulate[BarChart[{1, a, 4, 2 * a, 4, 3 * a, 1}], {a, 0, 5}]

Manipulate[PieChart[{1, a, 4, 2 * a, 4, 3 * a, 1}], {a, 0, 5}]

Manipulate[Graphics[Style[RegularPolygon[n], Hue[h]]], {n, 5, 20, 1}, {h, 0, 1}]

Manipulate[Graphics[Style[RegularPolygon[5], color]], {color, {Red, Yellow, Blue}}]
```

10. Images

```
CurrentImage[]

$ImagingDevices

$ImagingDevice = $ImagingDevices[[2]]

img = CurrentImage[]

ColorNegate[img]

Blur[img]

Blur[img, 10]

Table[Blur[img, n], {n, 0, 15, 5}]

ImageCollage[Table[Blur[img, n], {n, 0, 15, 5}]]

DominantColors[img]

Binarize[img]

DominantColors[Binarize[img]]

img1 = EdgeDetect[img]

ImageAdd[img, img1]

Manipulate[Binarize[img, t], {t, 0, 1}]

imgs = WikipediaData["knot theory", "ImageList"]

ImageCollage[Scaled[1] → imgs, Method → "ClosestPacking", Background → White]
```

11. Strings and Text

```
"This is a string."

StringLength["hello"]

StringReverse["hello"]

ToUpperCase["I'm coding in the Wolfram Language!"]

StringTake["this is about strings", 10]

StringLength[StringTake["this is about strings", 10]]

StringJoin["Hello", " ", "there!", " How are you?"]

{"apple", "banana", "strawberry"}

StringTake[{"apple", "banana", "strawberry"}, 2]

StringJoin[{"apple", "banana", "strawberry"}]

Characters["a string is made of characters"]

Sort[Characters["a string of characters"]]

InputForm[Sort[Characters["a string of characters"]]]

TextWords["This is a sentence. Sentences are made of words."]

StringLength[TextWords["This is a sentence. Sentences are made of words."]]

StringTake[WikipediaData["knot theory"], 100]

WordCloud[DeleteStopwords[WikipediaData["knot theory"]]]

Take[WordList[], 20]

WordCloud[StringTake[WordList[], 1]]

RomanNumeral[1988]

Table[RomanNumeral[n], {n, 20}]

ListLinePlot[Table[StringLength[RomanNumeral[n]], {n, 100}]]

IntegerName[56]

ListLinePlot[Table[StringLength[IntegerName[n]], {n, 100}]]

Alphabet[]

LetterNumber[{"a", "b", "x", "y", "z"}]

FromLetterNumber[{10, 11, 12, 13, 14, 15}]

Alphabet["Russian"]

Rasterize[Style["ABC", 100]]
```

```
EdgeDetect[Rasterize[Style["ABC", 100]]]
```

```
FromCharacterCode /@ Range[1000]
```

12. Sound

```
Sound[SoundNote["C"]]
```

```
Sound[{SoundNote["C"], SoundNote["C"], SoundNote["G"]}]
```

```
Sound[Table[SoundNote[RandomInteger[12], 0.1, "Violin"], 20]]
```

```
Play[Sin[440 × 2 Pi t], {t, 0, 1}]
```

```
Manipulate[
 {ℯ^f, Play[Sin[ℯ^f 2 Pi t], {t, 0, 1}, SampleRate → 100 000]},
 {{f, Log@440}, Log@10, Log@30 000}
]
```

A 48-crossing knot

```
Xp[4, 88, 5, 87] Xp[5, 75, 6, 74] Xp[6, 62, 7, 61] Xp[7, 49, 8, 48]
 Xp[8, 36, 9, 35] Xp[9, 23, 10, 22] Xp[16, 4, 17, 3] Xp[17, 87, 18, 86]
 Xp[18, 74, 19, 73] Xp[19, 61, 20, 60] Xp[20, 48, 21, 47] Xp[21, 35, 22, 34]
 Xp[28, 16, 29, 15] Xp[29, 3, 30, 2] Xp[30, 86, 31, 85] Xp[31, 73, 32, 72]
 Xp[32, 60, 33, 59] Xp[33, 47, 34, 46] Xp[40, 28, 41, 27] Xp[41, 15, 42, 14]
 Xp[42, 2, 43, 1] Xp[43, 85, 44, 84] Xp[44, 72, 45, 71] Xp[45, 59, 46, 58]
 Xp[52, 40, 53, 39] Xp[53, 27, 54, 26] Xp[54, 14, 55, 13] Xp[55, 1, 56, 96]
 Xp[56, 84, 57, 83] Xp[57, 71, 58, 70] Xp[64, 52, 65, 51] Xp[65, 39, 66, 38]
 Xp[66, 26, 67, 25] Xp[67, 13, 68, 12] Xp[68, 96, 69, 95] Xp[69, 83, 70, 82]
 Xp[76, 64, 77, 63] Xp[77, 51, 78, 50] Xp[78, 38, 79, 37] Xp[79, 25, 80, 24]
 Xp[80, 12, 81, 11] Xp[81, 95, 82, 94] Xp[88, 76, 89, 75] Xp[89, 63, 90, 62]
 Xp[90, 50, 91, 49] Xp[91, 37, 92, 36] Xp[92, 24, 93, 23] Xp[93, 11, 94, 10]
```