Stephen Wolfram's Introductionto the Wolfram Language

Thanks Stephen Wolfram.

In[ ]:= **2 + 2**

Out[ ]=

4

In[ ]:= **1000!**

Out[ ]=

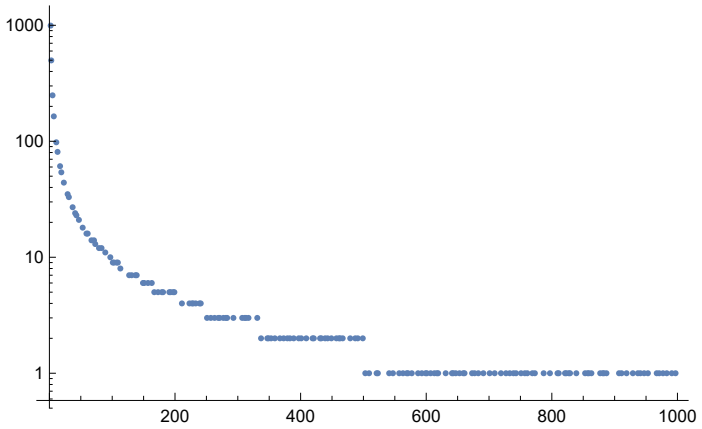
402 387 260 077 093 773 543 702 433 923 003 985 719 374 864 210 714 632 543 799 910 429 938 512 398 ⋱
629 020 592 044 208 486 969 404 800 479 988 610 197 196 058 631 666 872 994 808 558 901 323 829 669 ⋱
944 590 997 424 504 087 073 759 918 823 627 727 188 732 519 779 505 950 995 276 120 874 975 462 497 ⋱
043 601 418 278 094 646 496 291 056 393 887 437 886 487 337 119 181 045 825 783 647 849 977 012 476 ⋱
632 889 835 955 735 432 513 185 323 958 463 075 557 409 114 262 417 474 349 347 553 428 646 576 611 ⋱
667 797 396 668 820 291 207 379 143 853 719 588 249 808 126 867 838 374 559 731 746 136 085 379 534 ⋱
524 221 586 593 201 928 090 878 297 308 431 392 844 403 281 231 558 611 036 976 801 357 304 216 168 ⋱
747 609 675 871 348 312 025 478 589 320 767 169 132 448 426 236 131 412 508 780 208 000 261 683 151 ⋱
027 341 827 977 704 784 635 868 170 164 365 024 153 691 398 281 264 810 213 092 761 244 896 359 928 ⋱
705 114 964 975 419 909 342 221 566 832 572 080 821 333 186 116 811 553 615 836 546 984 046 708 975 ⋱
602 900 950 537 616 475 847 728 421 889 679 646 244 945 160 765 353 408 198 901 385 442 487 984 959 ⋱
953 319 101 723 355 556 602 139 450 399 736 280 750 137 837 615 307 127 761 926 849 034 352 625 200 ⋱
015 888 535 147 331 611 702 103 968 175 921 510 907 788 019 393 178 114 194 545 257 223 865 541 461 ⋱
062 892 187 960 223 838 971 476 088 506 276 862 967 146 674 697 562 911 234 082 439 208 160 153 780 ⋱
889 893 964 518 263 243 671 616 762 179 168 909 779 911 903 754 031 274 622 289 988 005 195 444 414 ⋱
282 012 187 361 745 992 642 956 581 746 628 302 955 570 299 024 324 153 181 617 210 465 832 036 786 ⋱
906 117 260 158 783 520 751 516 284 225 540 265 170 483 304 226 143 974 286 933 061 690 897 968 482 ⋱
590 125 458 327 168 226 458 066 526 769 958 652 682 272 807 075 781 391 858 178 889 652 208 164 348 ⋱
344 825 993 266 043 367 660 176 999 612 831 860 788 386 150 279 465 955 131 156 552 036 093 988 180 ⋱
612 138 558 600 301 435 694 527 224 206 344 631 797 460 594 682 573 103 790 084 024 432 438 465 657 ⋱
245 014 402 821 885 252 470 935 190 620 929 023 136 493 273 497 565 513 958 720 559 654 228 749 774 ⋱
011 413 346 962 715 422 845 862 377 387 538 230 483 865 688 976 461 927 383 814 900 140 767 310 446 ⋱
640 259 899 490 222 221 765 904 339 901 886 018 566 526 485 061 799 702 356 193 897 017 860 040 811 ⋱
889 729 918 311 021 171 229 845 901 641 921 068 884 387 121 855 646 124 960 798 722 908 519 296 819 ⋱
372 388 642 614 839 657 382 291 123 125 024 186 649 353 143 970 137 428 531 926 649 875 337 218 940 ⋱
694 281 434 118 520 158 014 123 344 828 015 051 399 694 290 153 483 077 644 569 099 073 152 433 278 ⋱
288 269 864 602 789 864 321 139 083 506 217 095 002 597 389 863 554 277 196 742 822 248 757 586 765 ⋱
752 344 220 207 573 630 569 498 825 087 968 928 162 753 848 863 396 909 959 826 280 956 121 450 994 ⋱
871 701 244 516 461 260 379 029 309 120 889 086 942 028 510 640 182 154 399 457 156 805 941 872 748 ⋱
998 094 254 742 173 582 401 063 677 404 595 741 785 160 829 230 135 358 081 840 096 996 372 524 230 ⋱
560 855 903 700 624 271 243 416 909 004 153 690 105 933 983 835 777 939 410 970 027 753 472 000 000 ⋱
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 ⋱
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 ⋱
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 ⋱
000 000 000 000 000 000

In[ ]:=
```
FactorInteger[%]
```
整数因子分解

Out[ ]=
```
{{2, 994}, {3, 498}, {5, 249}, {7, 164}, {11, 98}, {13, 81}, {17, 61}, {19, 54},
 {23, 44}, {29, 35}, {31, 33}, {37, 27}, {41, 24}, {43, 23}, {47, 21}, {53, 18},
 {59, 16}, {61, 16}, {67, 14}, {71, 14}, {73, 13}, {79, 12}, {83, 12}, {89, 11},
 {97, 10}, {101, 9}, {103, 9}, {107, 9}, {109, 9}, {113, 8}, {127, 7}, {131, 7},
 {137, 7}, {139, 7}, {149, 6}, {151, 6}, {157, 6}, {163, 6}, {167, 5}, {173, 5},
 {179, 5}, {181, 5}, {191, 5}, {193, 5}, {197, 5}, {199, 5}, {211, 4}, {223, 4},
 {227, 4}, {229, 4}, {233, 4}, {239, 4}, {241, 4}, {251, 3}, {257, 3}, {263, 3},
 {269, 3}, {271, 3}, {277, 3}, {281, 3}, {283, 3}, {293, 3}, {307, 3}, {311, 3},
 {313, 3}, {317, 3}, {331, 3}, {337, 2}, {347, 2}, {349, 2}, {353, 2}, {359, 2},
 {367, 2}, {373, 2}, {379, 2}, {383, 2}, {389, 2}, {397, 2}, {401, 2}, {409, 2},
 {419, 2}, {421, 2}, {431, 2}, {433, 2}, {439, 2}, {443, 2}, {449, 2}, {457, 2},
 {461, 2}, {463, 2}, {467, 2}, {479, 2}, {487, 2}, {491, 2}, {499, 2}, {503, 1},
 {509, 1}, {521, 1}, {523, 1}, {541, 1}, {547, 1}, {557, 1}, {563, 1}, {569, 1},
 {571, 1}, {577, 1}, {587, 1}, {593, 1}, {599, 1}, {601, 1}, {607, 1}, {613, 1},
 {617, 1}, {619, 1}, {631, 1}, {641, 1}, {643, 1}, {647, 1}, {653, 1}, {659, 1},
 {661, 1}, {673, 1}, {677, 1}, {683, 1}, {691, 1}, {701, 1}, {709, 1}, {719, 1},
 {727, 1}, {733, 1}, {739, 1}, {743, 1}, {751, 1}, {757, 1}, {761, 1}, {769, 1},
 {773, 1}, {787, 1}, {797, 1}, {809, 1}, {811, 1}, {821, 1}, {823, 1}, {827, 1},
 {829, 1}, {839, 1}, {853, 1}, {857, 1}, {859, 1}, {863, 1}, {877, 1}, {881, 1},
 {883, 1}, {887, 1}, {907, 1}, {911, 1}, {919, 1}, {929, 1}, {937, 1}, {941, 1},
 {947, 1}, {953, 1}, {967, 1}, {971, 1}, {977, 1}, {983, 1}, {991, 1}, {997, 1}}
```

In[ ]:=
```
ListLogPlot[%]
```
点集的对数图

Out[ ]=



In[ ]:=
```
net = SocialMediaData["Facebook", "FriendNetwork"]
```
社会媒体数据

```
CommunityGraphPlot[net]
```
社区图

```
Max[DegreeCentrality[net]]
```
… 中心度

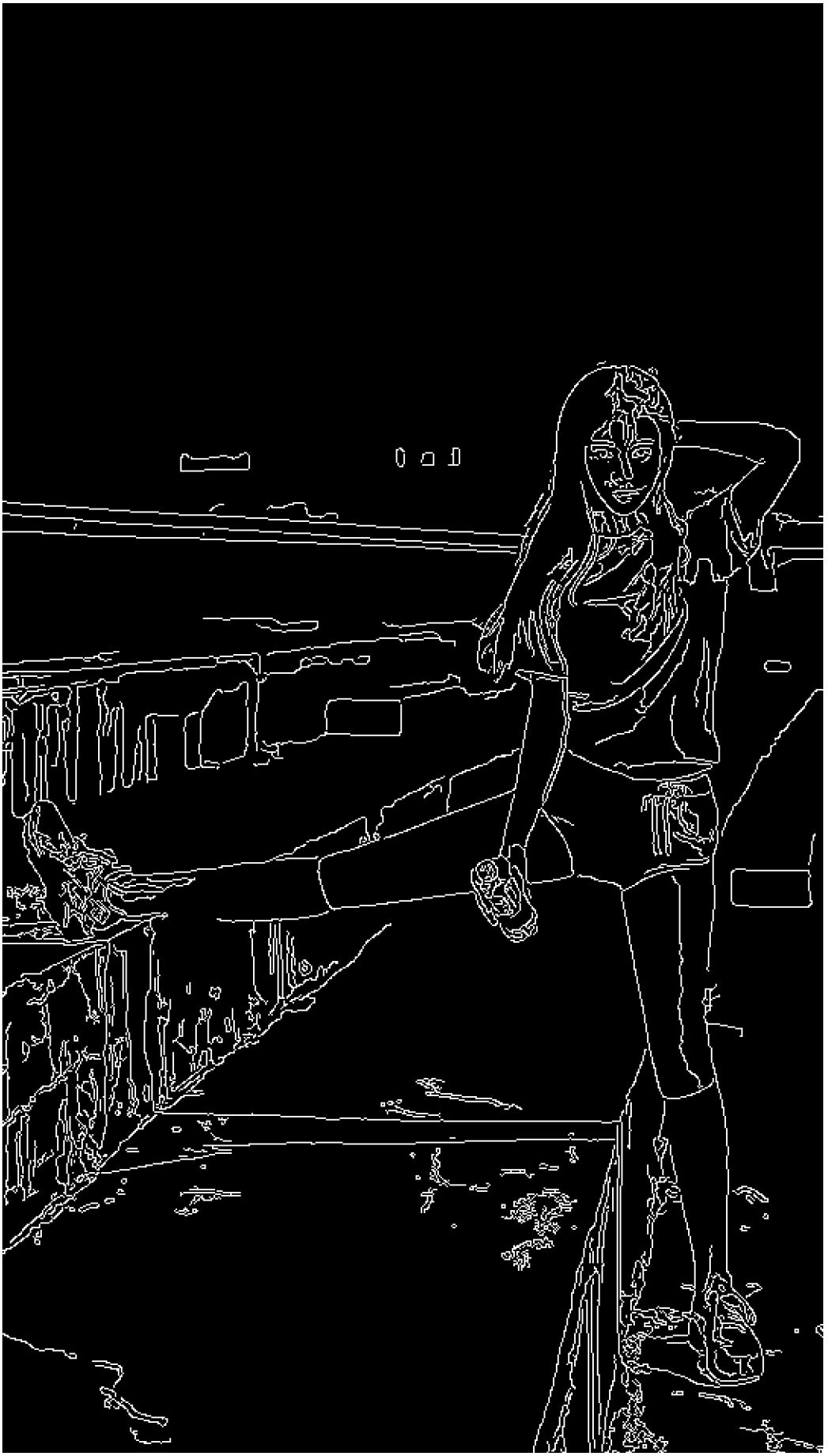
```
CurrentImage[]
```
当前图像

In[ ]:=
```
img = Import["E:\\MISC\\Image\\20190606190251.jpg"]
```
导入 自然常数 图像

Out[ ]=

In[ ]:=
```
EdgeDetect[img]
```
边缘检测

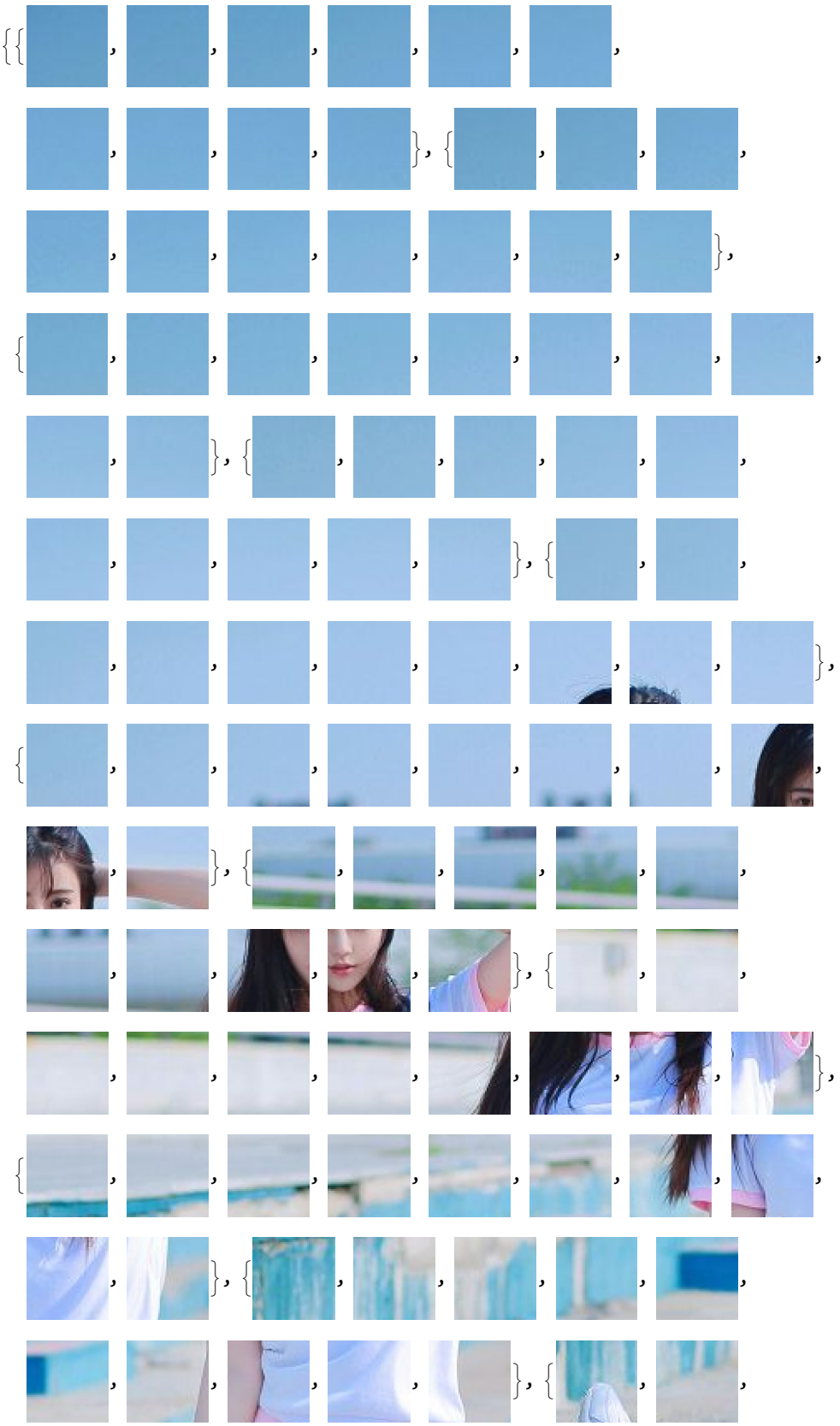
Out[ ]=

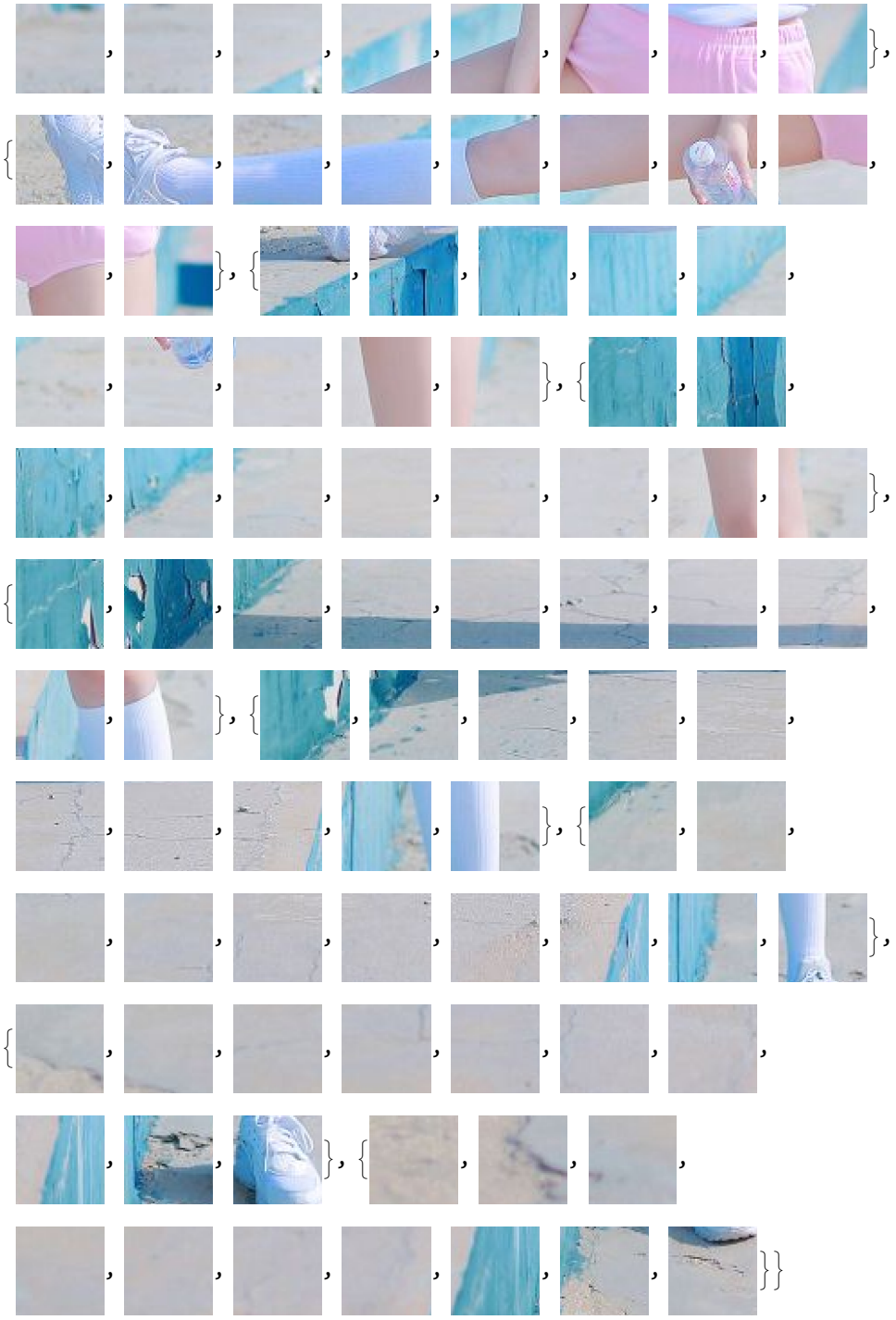


```
Dynamic[EdgeDetect[CurrentImage[]]]
```
动态　边缘检测　当前图像

In[ ]:=
```
ImagePartition[img, 50]
```
图像划分

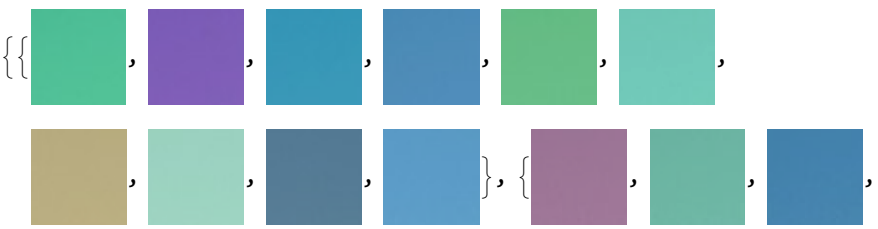
Out[ ]=

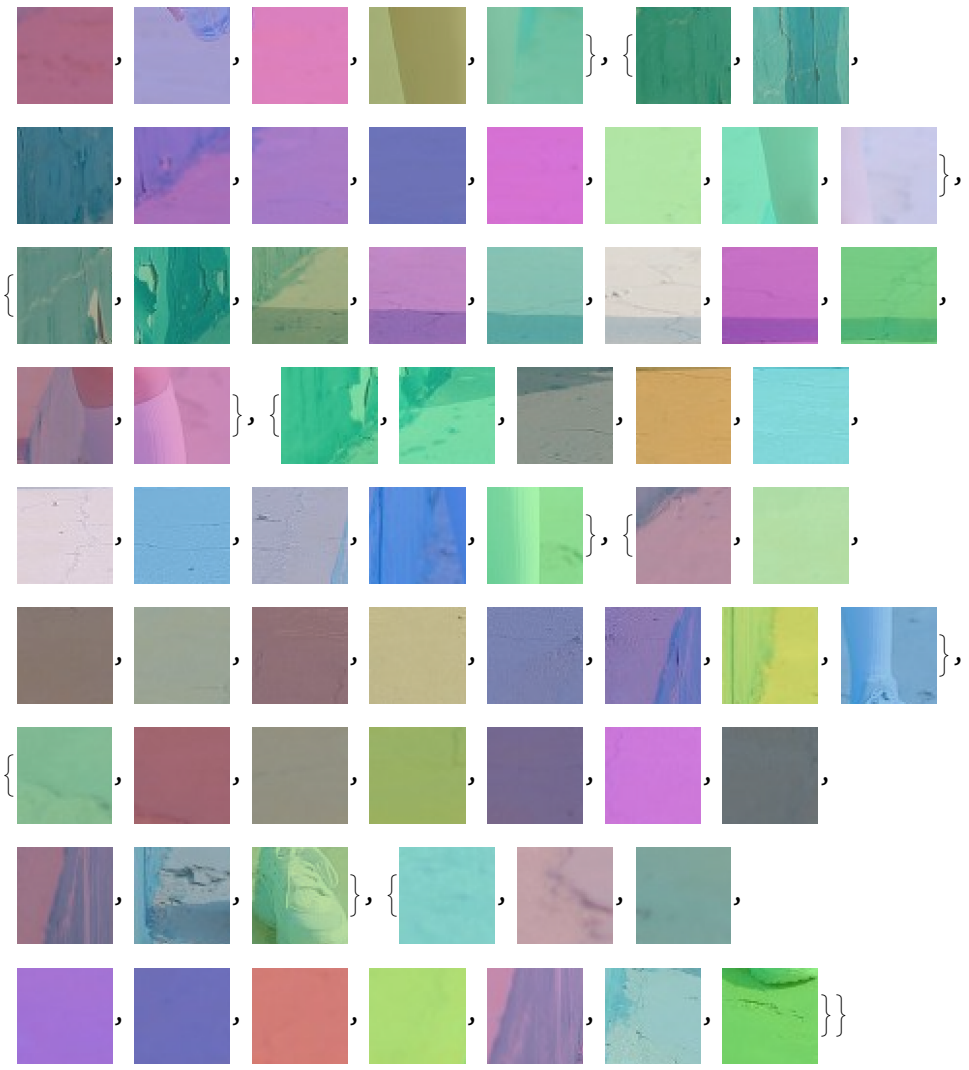




In[ ]:=
```
Map[Blend[{#, RandomColor[]}] &, %, {2}]
```
映射 混合 随机颜色

Out[ ]=





In[ ]:= **ImageAssemble[%]**

组合图像

Out[ ]=

In[ ]:=
```
Sunset[Today] - Sunrise[Today]
```
日落 今天 日出 今天

Out[ ]=
```
814 min
```

In[ ]:=
```
UnitConvert[%, "Days"]
```
单位转换

Out[ ]=
$$\frac{407}{720}\ \text{days}$$

In[ ]:=
```
UnitConvert[Quantity[407/720, "Days"], MixedUnit[{"Hours", "Minutes", "Seconds"}]]
```
单位转换 数量 混合单位

Out[ ]=
```
13 h 34 min 0 s
```

In[ ]:=

countries in south america »

South America COUNTRIES

Out[ ]=

South America

In[ ]:=
```
EntityList[ South America COUNTRIES ]
```
实体列表

Out[ ]=

{Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Falkland Islands, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela}

In[ ]:= **EntityValue[%, "Flag"]**

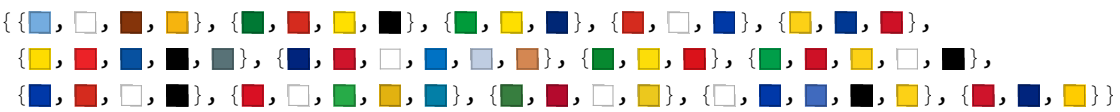
实体属性值

Out[ ]=

In[ ]:= **DominantColors /@ %**

主色

Out[ ]=



In[ ]:=
```
Grid[{#, Row[DominantColors[EntityValue[#, "Flag"]]]} & /@
  %12, Frame → All]
```
格子 行 主色 实体属性值 边框 全部

Out[ ]=

Argentina	
Bolivia	
Brazil	
Chile	
Colombia	
Ecuador	
Falkland Islands	
French Guiana	
Guyana	
Paraguay	
Peru	
Suriname	
Uruguay	
Venezuela	

In[ ]:=
```
capitals = CountryData["WesternEurope", "CapitalCity"]
```
国家数据

Out[ ]=

{Andorra la Vella, Vienna, Brussels, Copenhagen, Torshavn, Paris, Berlin, Gibraltar, Athens, Saint Peter Port, Reykjavik, Dublin, Douglas, Rome, Saint Helier, Vaduz, Luxemburg, Valletta, Monaco, Amsterdam, Oslo, Lisbon, San Marino, Madrid, Longyearbyen, Stockholm, Bern, London, Vatican City}

In[ ]:=
```
tour = FindShortestTour[GeoPosition /@ capitals] // Last
```
遍历各点的最短距离 测地位置 最后一

Out[ ]=

```
{1, 24, 8, 22, 10, 15, 6, 17, 3, 20, 28, 12, 13,
 5, 11, 25, 21, 26, 4, 7, 2, 9, 18, 14, 29, 23, 16, 27, 19, 1}
```

In[ ]:=
```
capitals[[tour]]
```

Out[ ]=

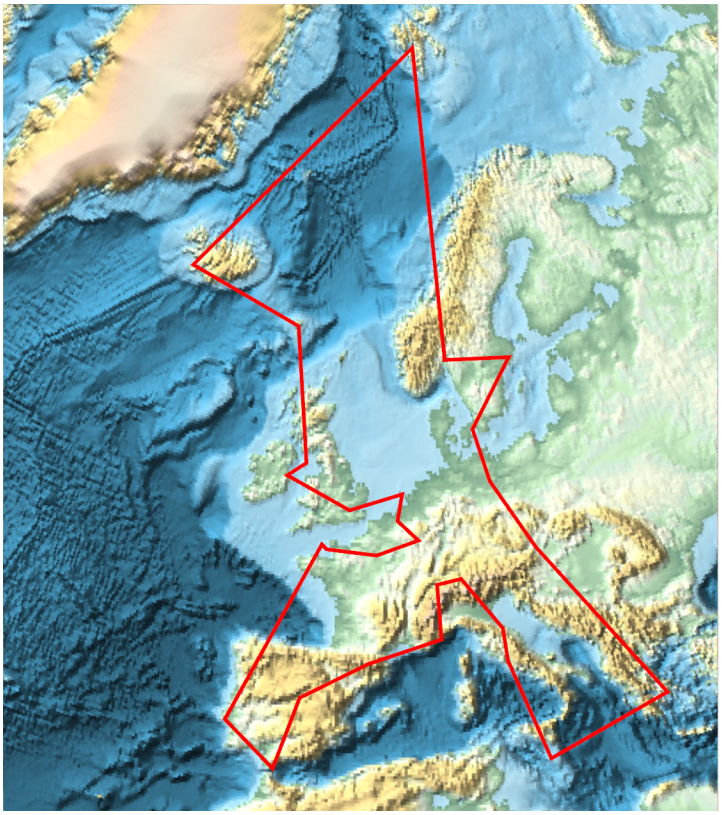
{Andorra la Vella, Madrid, Gibraltar, Lisbon, Saint Peter Port, Saint Helier, Paris, Luxemburg, Brussels, Amsterdam, London, Dublin, Douglas, Torshavn, Reykjavik, Longyearbyen, Oslo, Stockholm, Copenhagen, Berlin, Vienna, Athens, Valletta, Rome, Vatican City, San Marino, Vaduz, Bern, Monaco, Andorra la Vella}

In[ ]:=
```
GeoGraphics[{Thick, Red, Line[%]}]
```
地理图形 粗 红色 线段

Out[ ]=

In[ ]:=
```
GeoGraphics[{Thick, Red, Line[%18]}, GeoBackground → GeoStyling["ReliefMap"]]
```
地理图形 粗 红色 线段 地理背景 地理对象的样式

Out[ ]=



In[ ]:=
```
x
```

Out[ ]=
```
x
```

In[ ]:=
```
-1 + x^10^5
```

Out[ ]=
$$-1 + x^{100\,000}$$

In[ ]:=
```
Factor[-1 + x^100000]
```
因式分解

Out[ ]=
$$(-1+x)\,(1+x)\,\left(1+x^2\right)\,\left(1+x^4\right)\,\left(1-x+x^2-x^3+x^4\right)\,\left(1+x+x^2+x^3+x^4\right)\,\left(1+x^8\right)$$
$$\left(1-x^2+x^4-x^6+x^8\right)\,\left(1+x^{16}\right)\,\left(1-x^4+x^8-x^{12}+x^{16}\right)\,\left(1-x^5+x^{10}-x^{15}+x^{20}\right)$$
$$\left(1+x^5+x^{10}+x^{15}+x^{20}\right)\,\left(1-x^8+x^{16}-x^{24}+x^{32}\right)\,\left(1-x^{10}+x^{20}-x^{30}+x^{40}\right)$$
$$\left(1-x^{16}+x^{32}-x^{48}+x^{64}\right)\,\left(1-x^{20}+x^{40}-x^{60}+x^{80}\right)\,\left(1-x^{25}+x^{50}-x^{75}+x^{100}\right)$$
$$\left(1+x^{25}+x^{50}+x^{75}+x^{100}\right)\,\left(1-x^{40}+x^{80}-x^{120}+x^{160}\right)\,\left(1-x^{50}+x^{100}-x^{150}+x^{200}\right)$$
$$\left(1-x^{80}+x^{160}-x^{240}+x^{320}\right)\,\left(1-x^{100}+x^{200}-x^{300}+x^{400}\right)\,\left(1-x^{125}+x^{250}-x^{375}+x^{500}\right)$$
$$\left(1+x^{125}+x^{250}+x^{375}+x^{500}\right)\,\left(1-x^{200}+x^{400}-x^{600}+x^{800}\right)\,\left(1-x^{250}+x^{500}-x^{750}+x^{1000}\right)$$
$$\left(1-x^{400}+x^{800}-x^{1200}+x^{1600}\right)\,\left(1-x^{500}+x^{1000}-x^{1500}+x^{2000}\right)\,\left(1-x^{625}+x^{1250}-x^{1875}+x^{2500}\right)$$
$$\left(1+x^{625}+x^{1250}+x^{1875}+x^{2500}\right)\,\left(1-x^{1000}+x^{2000}-x^{3000}+x^{4000}\right)\,\left(1-x^{1250}+x^{2500}-x^{3750}+x^{5000}\right)$$
$$\left(1-x^{2000}+x^{4000}-x^{6000}+x^{8000}\right)\,\left(1-x^{2500}+x^{5000}-x^{7500}+x^{10\,000}\right)$$
$$\left(1-x^{5000}+x^{10\,000}-x^{15\,000}+x^{20\,000}\right)\,\left(1-x^{10\,000}+x^{20\,000}-x^{30\,000}+x^{40\,000}\right)$$

In[ ]:=
```
{6, 7, 2, 1, 1, 1, Indeterminate, 1, 1, a, b}
```
不确定

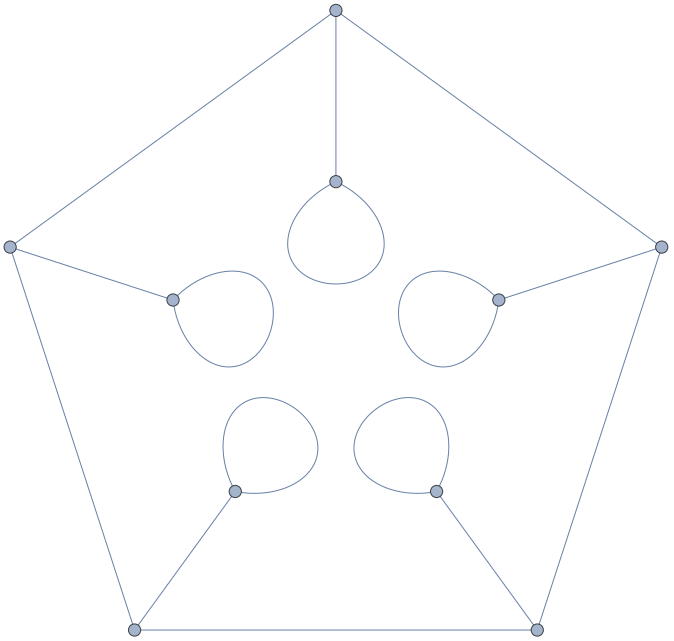
Out[ ]=
```
{6, 7, 2, 1, 1, 1, Indeterminate, 1, 1, a, b}
```

In[ ]:=
```
{6, 7, 2, 1, 1, 1, Indeterminate, 1, 1, a, b}^10 + 4
```
不确定

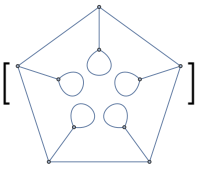
Out[ ]=
$$\{60\,466\,180,\ 282\,475\,253,\ 1028,\ 5,\ 5,\ 5,\ \text{Indeterminate},\ 5,\ 5,\ 4 + a^{10},\ 4 + b^{10}\}$$

In[ ]:=
```
PetersenGraph[5, 15]
```
彼得森图

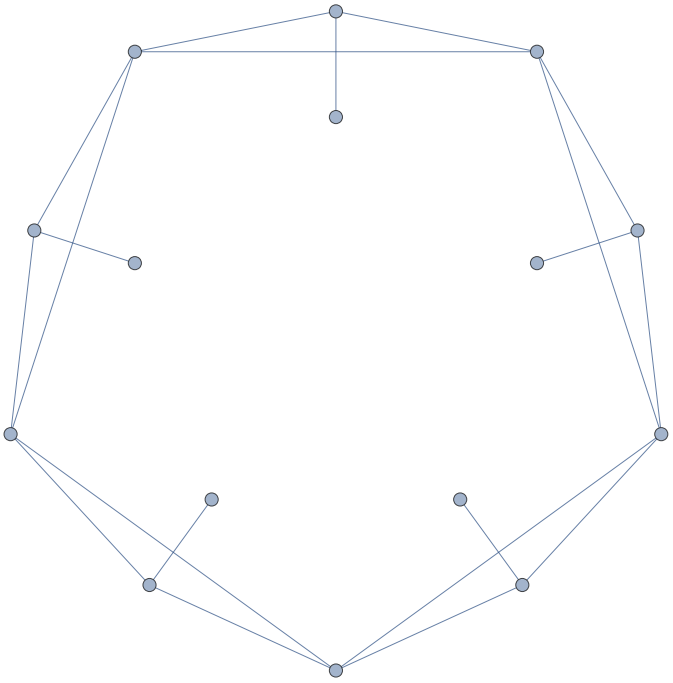
Out[ ]=



In[ ]:=
```
LineGraph[ ]
```
线图

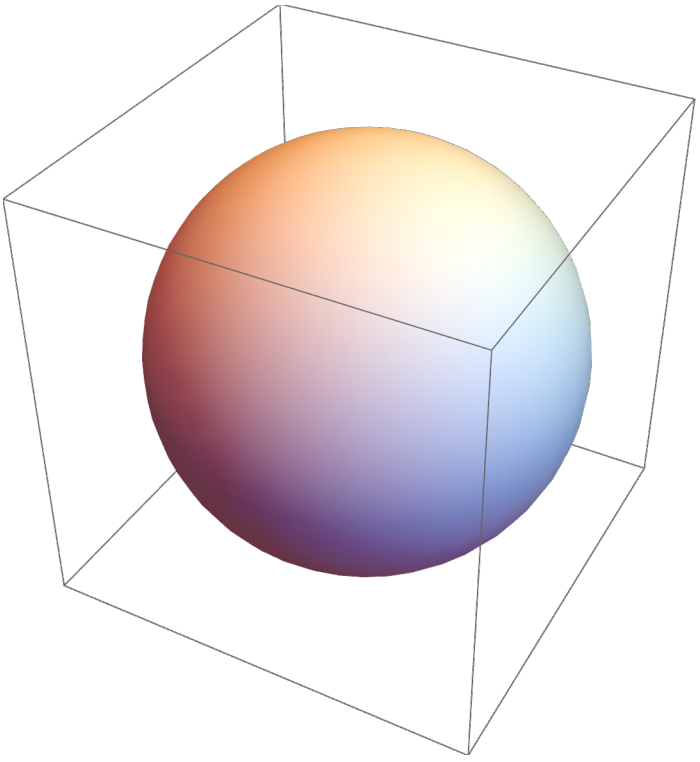


Out[ ]=



In[ ]:=
```
Graphics3D[Sphere[]]
```
三维图形 球体

Out[ ]=

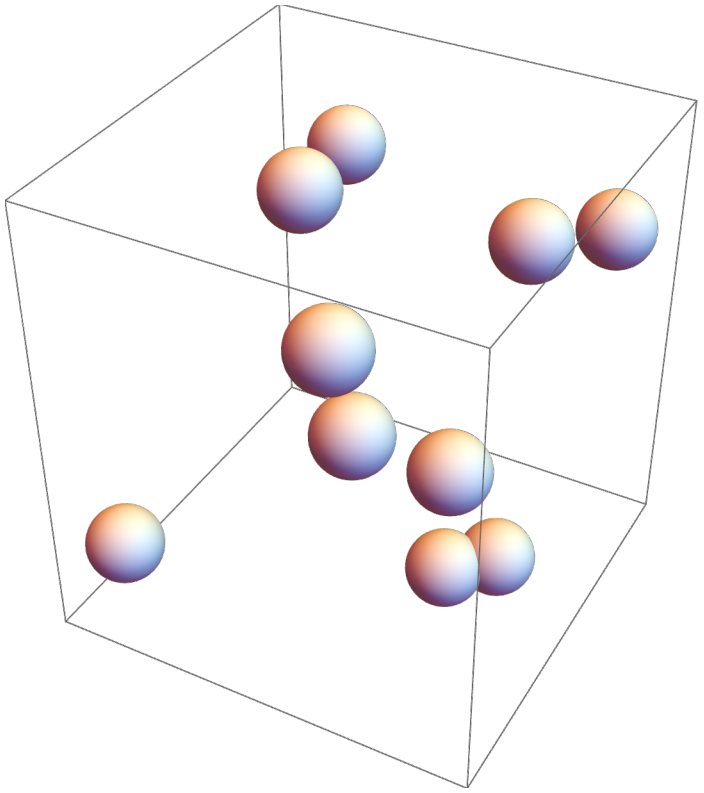


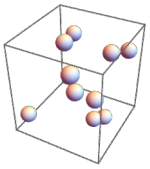
In[ ]:=
```
Table[Sphere[RandomInteger[10, 3]], {10}]
```
表格 球体 伪随机整数

Out[ ]=
```
{Sphere[{4, 5, 10}], Sphere[{7, 1, 9}], Sphere[{8, 5, 0}],
 Sphere[{1, 1, 1}], Sphere[{9, 6, 0}], Sphere[{10, 10, 8}],
 Sphere[{3, 9, 9}], Sphere[{9, 3, 5}], Sphere[{7, 2, 6}], Sphere[{9, 7, 9}]}
```

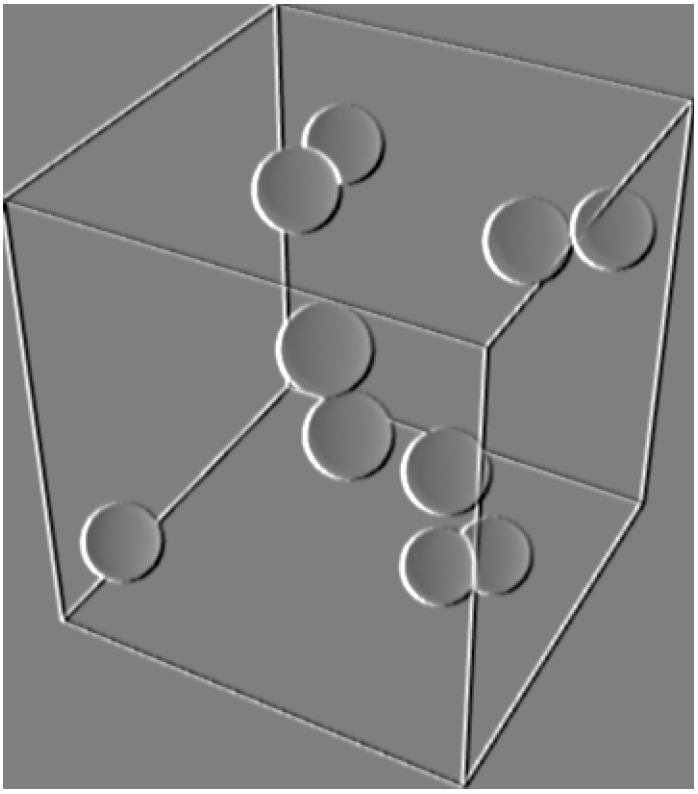
In[ ]:=
```
Graphics3D[%]
```
三维图形

Out[ ]=



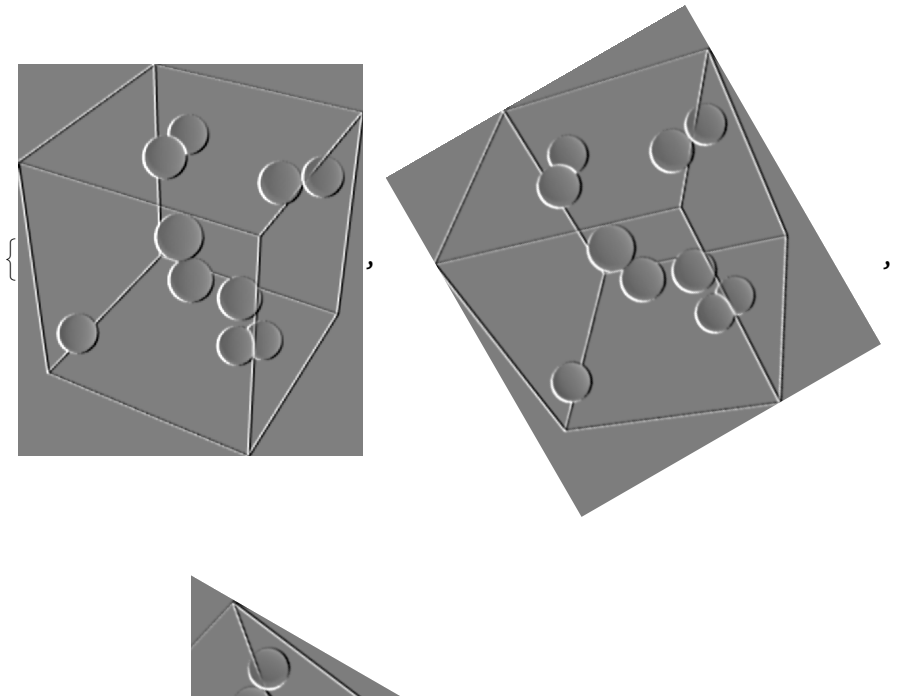
In[ ]:=
```
ImageEffect[  , "Embossing"]
```
图像效果

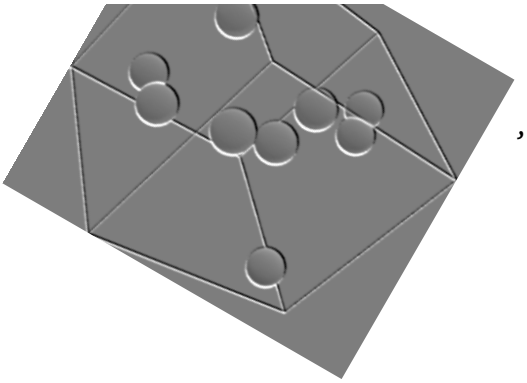
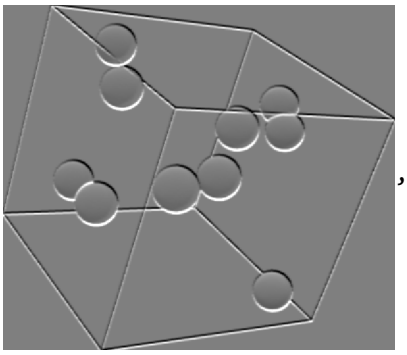
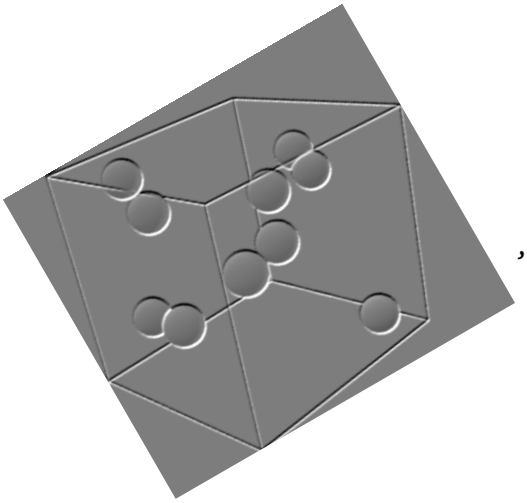
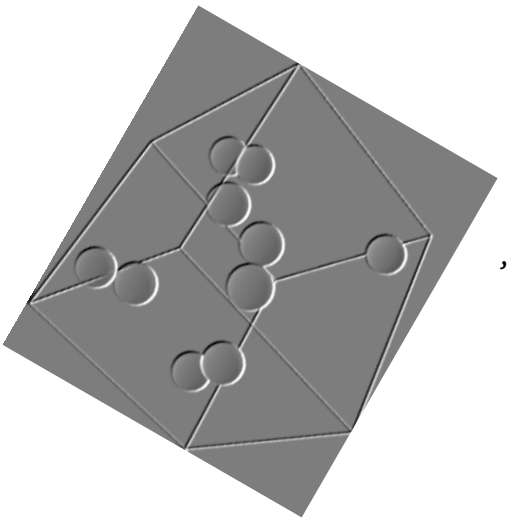
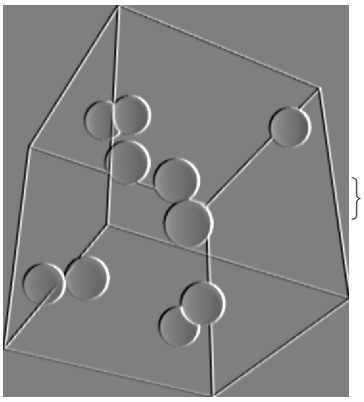
Out[ ]=



In[ ]:=
```
Table[Rotate[%, θ], {θ, 0, 180 °, 30 °}]
```
表格 旋转

Out[ ]=

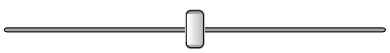



,

,

,

,

}

In[ ]:= **Slider[]**

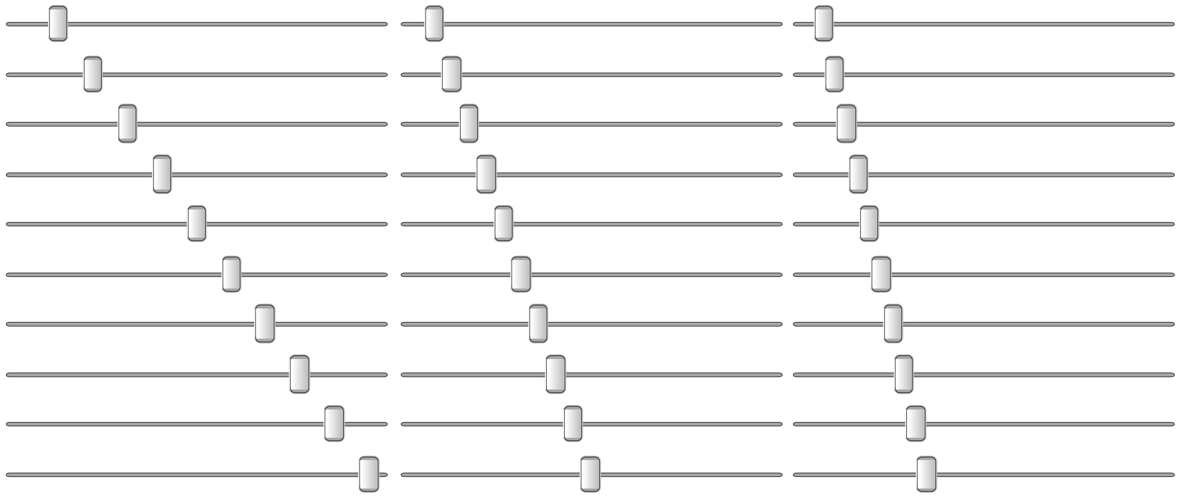
滑动条

Out[ ]=



In[∘]:=
```
Grid[Table[Slider[i / j / 10], {i, 10}, {j, 3}]]
```
格子 表格 滑动条

Out[∘]=



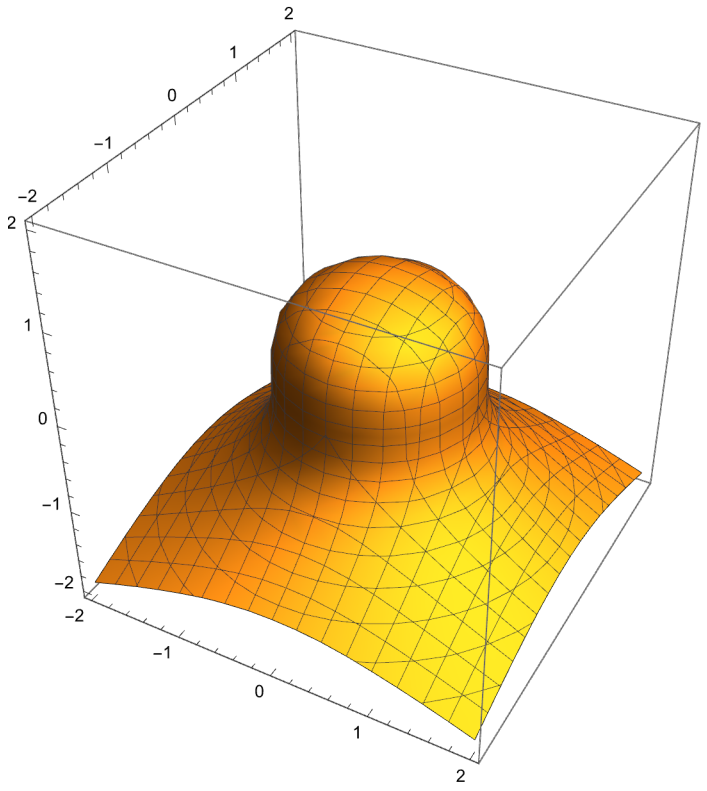
In[∘]:=
```
Table[Style["hello", k], {k, 60}]
```
表格 样式

Out[∘]=

{…, hello, hello, hello, hello, hello, hello, hello, hello, hello, hello, hello, hello, hello, hello,
hello, hello, hello, hello, hello, hello, hello, hello,
hello, hello, hello, hello, hello, hello,
hello, hello, hello, hello, hello,
hello, hello, hello, hello, hello,
hello, hello, hello, hello,
hello, hello, hello, hello,
hello, hello, hello, hello,
hello, hello, hello,
hello, hello, hello,
hello, hello, hello}

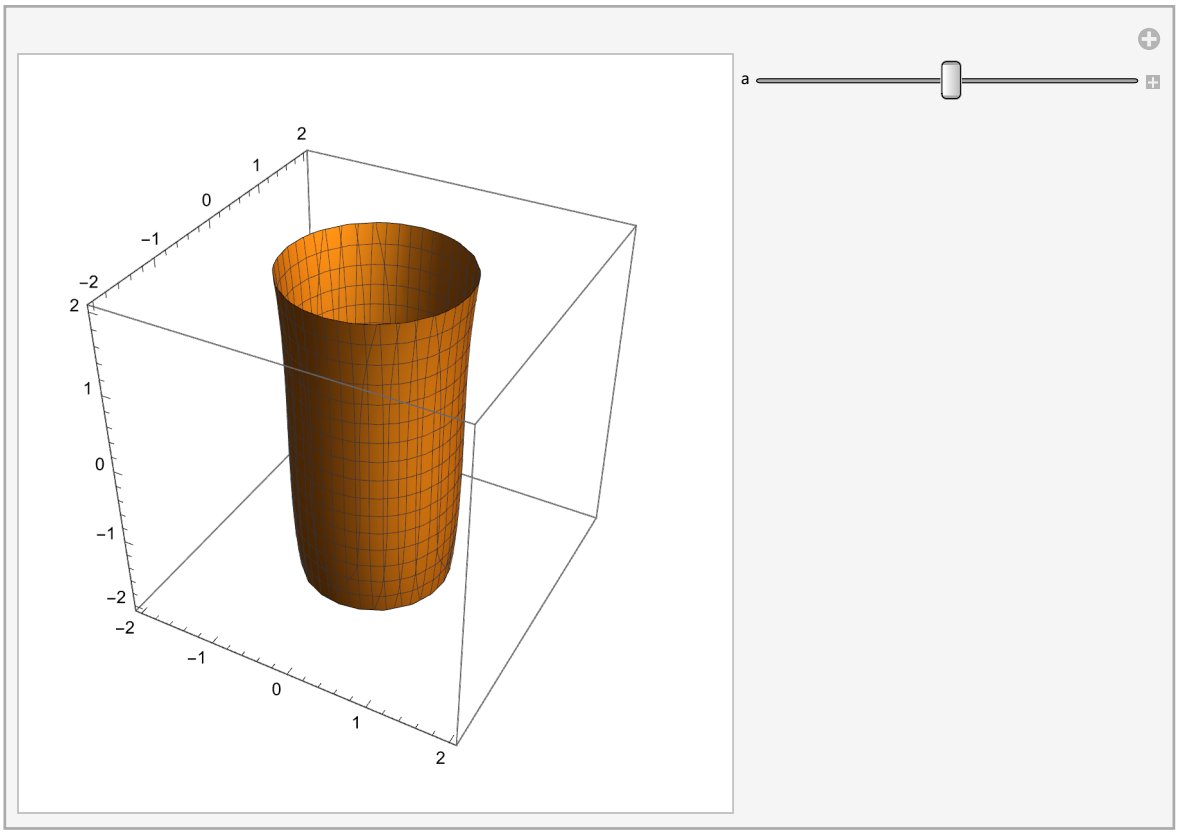
In[ ]:=
```
ContourPlot3D[x^2 + y^2 + z^3 == 1, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}]
```
三维等高线

Out[ ]=



In[ ]:=
```
Manipulate[ContourPlot3D[x^2 + y^2 + a z^3 == 1, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}], {a, 1, -1}]
```
交互式操作　三维等高线

Out[ ]=



In[ ]:=
```
Manipulate[Factor[x^n + 1], {n, 1, 100, 1}]
```
交互式操作　因式分解

Out[ ]=

$$\left(1 + x^2\right)\left(1 - x^2 + x^4 - x^6 + x^8 - x^{10} + x^{12}\right)$$

In[ ]:=
```
f[x, y]
```

Out[ ]=
```
f[x, y]
```

In[ ]:=
```
x^2 + y^3
```

Out[ ]=
```
x^2 + y^3
```

In[ ]:=
```
FullForm[%]
```
完全格式

Out[ ]//FullForm=
```
Plus[Power[x, 2], Power[y, 3]]
```

In[ ]:=

new york city »

New York City CITY

Out[ ]=

New York City

In[ ]:= **% // FullForm**

完全格式

Out[ ]//FullForm=

```
Entity["City", List["NewYork", "NewYork", "UnitedStates"]]
```

In[ ]:= **NestList[f, x, 10]**

嵌套列表

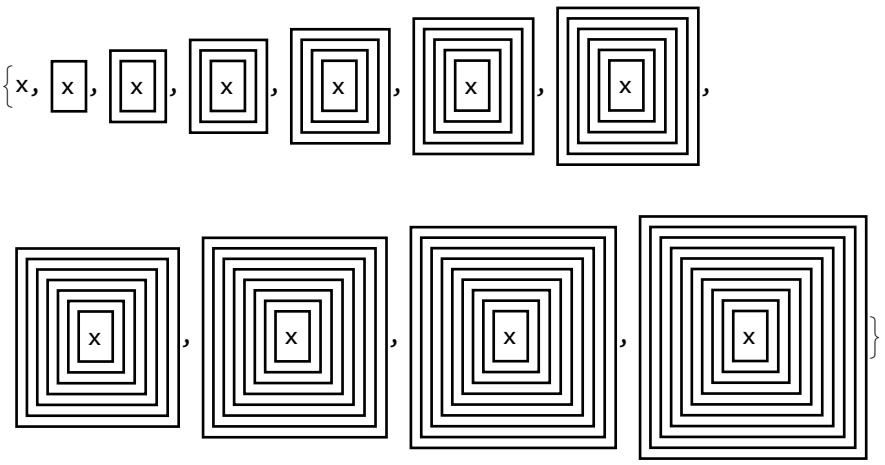
Out[ ]=

```
{x, f[x], f[f[x]], f[f[f[x]]], f[f[f[f[x]]]], f[f[f[f[f[x]]]]],
 f[f[f[f[f[f[x]]]]]], f[f[f[f[f[f[f[x]]]]]]], f[f[f[f[f[f[f[f[x]]]]]]]],
 f[f[f[f[f[f[f[f[f[x]]]]]]]]], f[f[f[f[f[f[f[f[f[f[x]]]]]]]]]]}
```

In[ ]:= **NestList[Framed, x, 10]**

嵌套列表　加边框

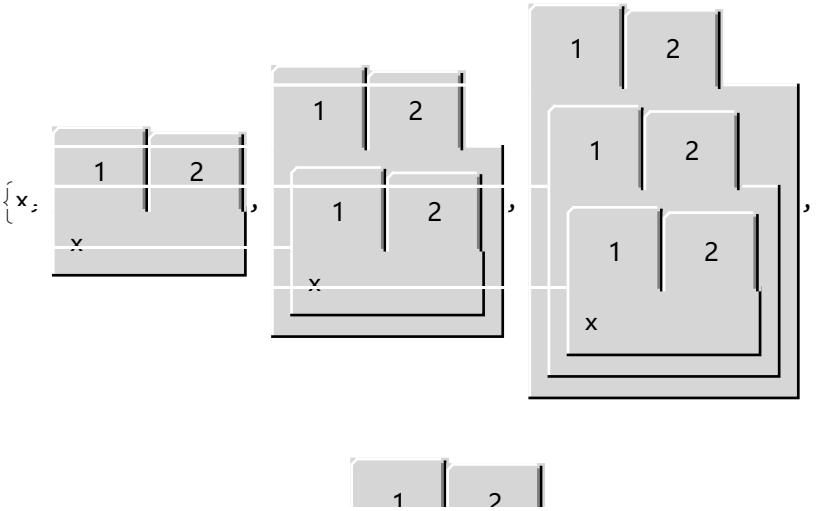
Out[ ]=

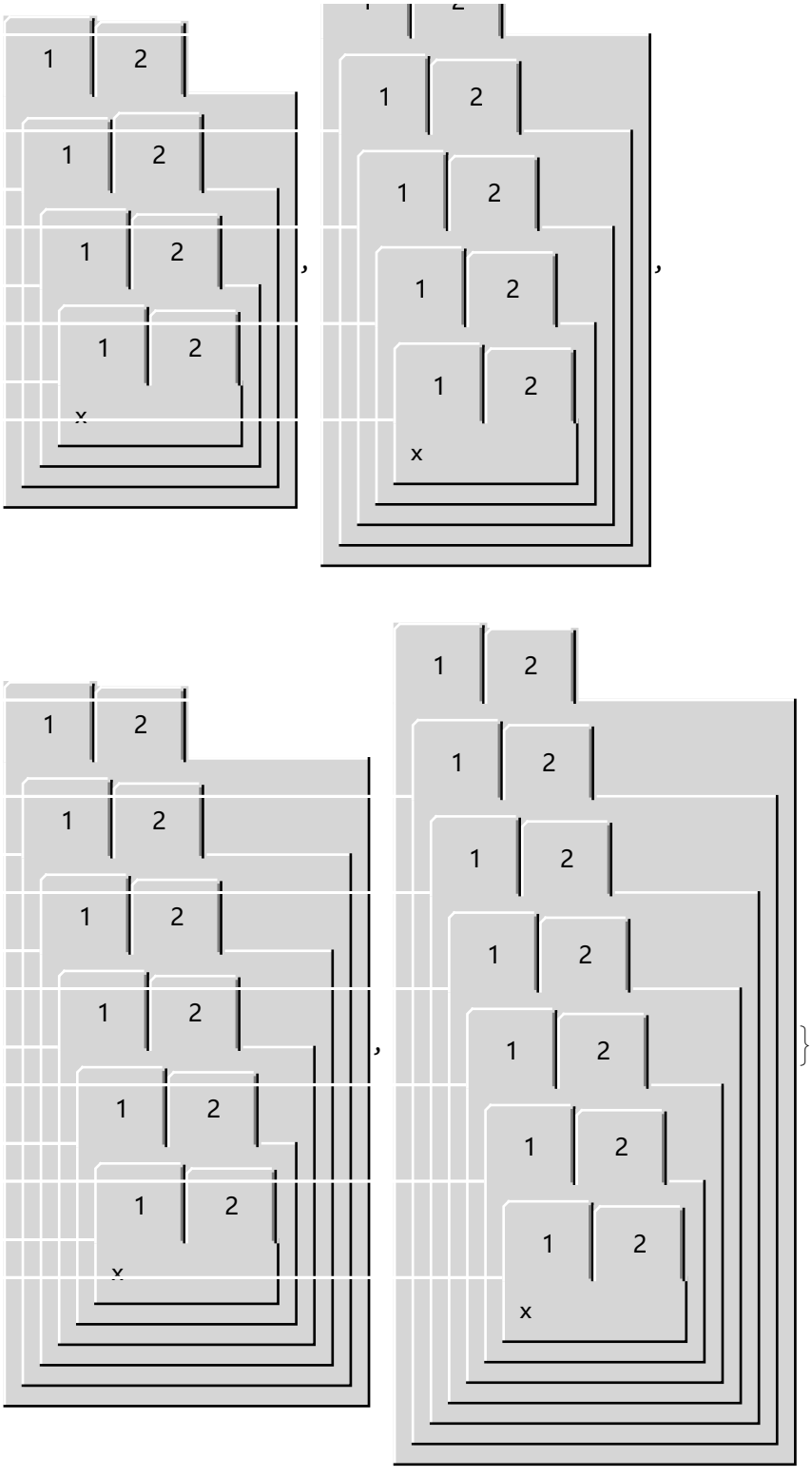


In[ ]:= **NestList[TabView[{#, #}] &, x, 7]**

嵌套列表　选项卡控件

Out[ ]=





In[ ]:= `Import["http://www.stephenwolfram.com", "Hyperlinks"]`

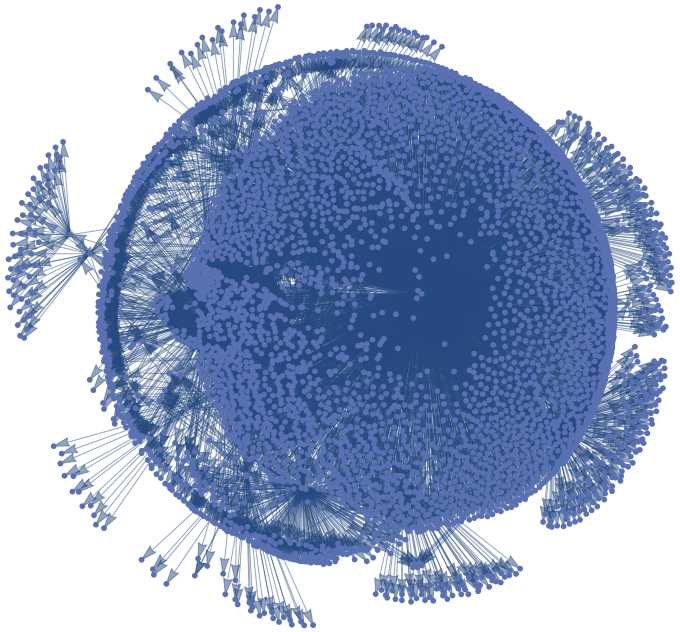
导入

Out[ ]=

```
{http://www.wolframphysics.org/livestreams/,
 http://writings.stephenwolfram.com/2020/04/finally-we-may-have-a-path-to-the-
   fundamental-theory-of-physics-and-its-beautiful,
 http://writings.stephenwolfram.com/, http://www.stephenwolfram.com/publications/,
 http://www.stephenwolfram.com/media/, http://www.stephenwolfram.com/scrapbook/,
 http://www.stephenwolfram.com/questions/, http://www.stephenwolfram.com/about/,
 http://www.stephenwolfram.com/contact/, http://www.wolfram.com/,
 http://www.wolfram.com/mathematica/, http://www.wolframalpha.com/,
 http://www.wolfram.com/language/, http://www.wolframscience.com/,
 http://www.stephenwolfram.com/publications/,
 http://www.wolframphysics.org/, http://twitter.com/stephen_wolfram,
 http://www.stephenwolfram.com/livestreams, http://soundcloud.com/stephenwolfram/,
 https://writings.stephenwolfram.com/all-by-date,
 https://www.wolfram-media.com/products/combinators-a-centennial-view.html,
 http://www.wolfram-media.com/products/a-project-to-find-the-fundamental-theory-of-
   physics.html,
 http://www.wolfram-media.com/products/adventures-of-a-computational-explorer.html,
 http://www.wolfram-media.com/products/idea-makers.html,
 http://www.wolfram.com/language/elementary-introduction/,
 http://www.wolframscience.com/nks/, http://www.wolfram-media.com/,
 http://www.wolfram.com/, http://www.wolfram.com/language,
 https://www.wolframphysics.org/, http://www.wolframalpha.com/,
 http://www.wolframfoundation.org/, http://rule30prize.org/,
 http://www.wolfram.com/mathematica, http://education.wolfram.com/summer/,
 http://www.wolframscience.com/prizes/tm23/,
 http://www.facebook.com/Stephen-Wolfram-188916357807416/,
 http://twitter.com/stephen_wolfram, http://www.linkedin.com/in/stephenwolfram,
 http://www.stephenwolfram.com/contact/, http://www.enable-javascript.com/}
```

In[ ]:=
```
Graph[Flatten[
 Rest[NestList[Union[Flatten[Thread[# → Import[#, "Hyperlinks"]] & /@ Last /@ #]] &,
   {"" → "http://www.stephenwolfram.com"}, 2]]]]
```
图 压平 … 嵌套列表 并集 压平 逐项作用 导入 最后一个

Out[ ]=



In[ ]:=
```
dict = Nearest[WordData[]]
```
最接近 单词数据

Out[ ]=

NearestFunction[Data points: 149 191 Input: String]

In[ ]:=
```
dict["eleephannt"]
```

Out[ ]=

{elephant}

In[ ]:=
```
Select[DictionaryLookup[], # === StringReverse[#] &]
```
选择 字典查询 颠倒字符串

Out[ ]=

{a, aha, aka, bib, bob, boob, bub, CFC, civic, dad, deed, deified, did, dud, DVD,
 eke, ere, eve, ewe, eye, gag, gig, huh, I, kayak, kook, level, ma'am, madam, mam,
 MGM, minim, mom, mum, nan, non, noon, nun, oho, pap, peep, pep, pip, poop, pop,
 pup, radar, redder, refer, repaper, reviver, rotor, sagas, sees, seres, sexes,
 shahs, sis, solos, SOS, stats, stets, tat, tenet, TNT, toot, tot, tut, wow, WWW}

In[ ]:=
```
planets = ExampleData[{"Dataset", "Planets"}]
```
范例数据 数据集

Out[ ]=

	Mass	Radius	Moons		
				Mass	Radius
Mercury	3.30104×10^{23} kg	2439.7 km			
Venus	4.86732×10^{24} kg	6051.9 km			
Earth	5.9721986×10^{24}	6367.4447 km	Moon	7.3459×10^{22} kg	1737.5 km
Mars	6.41693×10^{23} kg	3386. km	Phobos	1.072×10^{16} kg	11.1 km
			Deimos	1.5×10^{15} kg	6.2 km
Jupiter	1.89813×10^{27} kg	69 173. km	Metis	$1.\times10^{17}$ kg	21.5 km
			Adrastea	$7.\times10^{15}$ kg	8.2 km
			63 total ›		
Saturn	5.68319×10^{26} kg	57 316. km	Tarqeq	—	3.5 km
			Pan	4.9×10^{15} kg	12.8 km
			61 total ›		
Uranus	8.68103×10^{25} kg	25 266. km	Cordelia	4.5×10^{16} kg	20.1 km
			Ophelia	5.4×10^{16} kg	21.4 km
			27 total ›		
Neptune	1.02410×10^{26} kg	24 553. km	Naiad	1.9×10^{17} kg	33. km
			Thalassa	3.7×10^{17} kg	41. km
			13 total ›		

In[ ]:=
```
planets[All, "Moons", Mean, "Radius"]
```
全部 平均值

Out[ ]=

Mercury	—
Venus	—
Earth	1737.5 km
Mars	8.7 km
Jupiter	141.8 km
Saturn	104.0 km
Uranus	133. km
Neptune	168. km

In[ ]:=
```
f[{x_, {c_, y_}}] := √(x^2 + c y^2)
f[{1, {a, b}}]
```

Out[ ]=

$$\sqrt{1 + a\, b^2}$$

In[ ]:=
```
f[{a, b}]
```

Out[ ]=
```
f[{a, b}]
```

In[ ]:=
```
cyclops[r_] := Graphics[{Yellow, Disk[], Black, Disk[{0, 0}, r]}]
```
图形 黄色 圆盘 黑色 圆盘
```
Manipulate[cyclops[r], {r, 0, 1}]
```
交互式操作

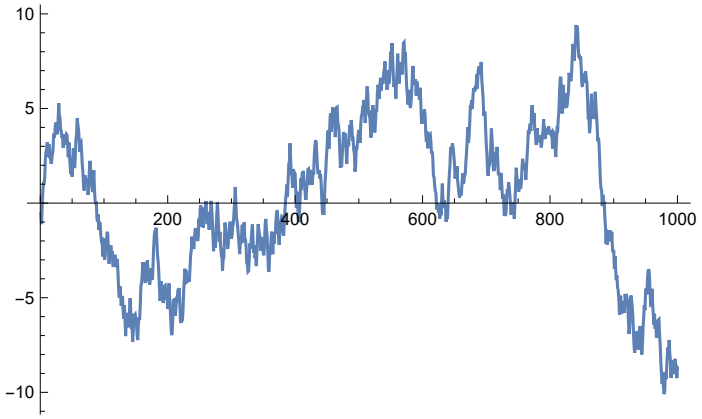
Out[ ]=

In[ ]:=
```
CloudDeploy[Manipulate[cyclops[r], {r, 0, 1}]]
```
云部署 交互式操作

Out[ ]=
```
CloudObject[https://www.wolframcloud.com/obj/cdac6036-1236-4358-9e6e-f5adc5a488b1]
```

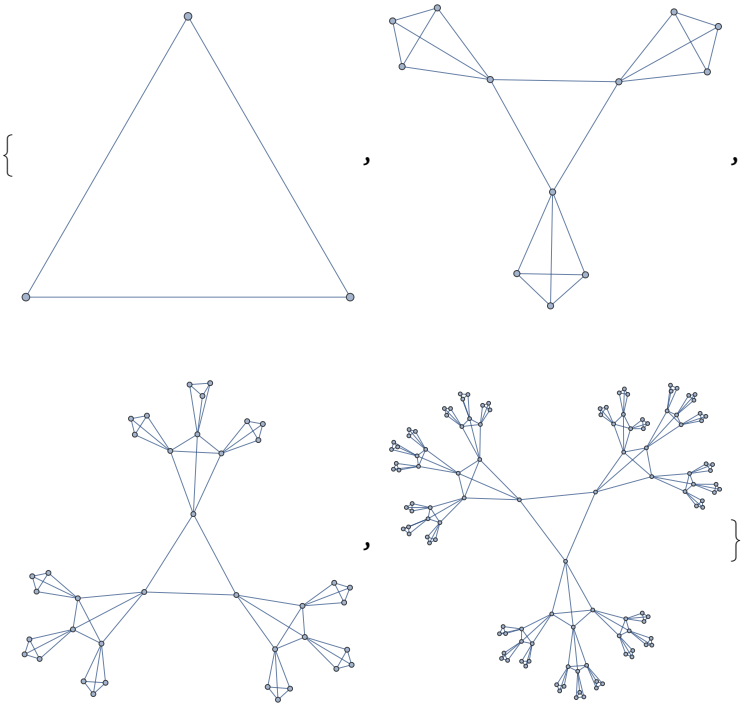
In[ ]:=
```
ListLinePlot[Accumulate[RandomReal[{-1, 1}, 1000]]]
```
绘制点集的线条 累加 伪随机实数

Out[ ]=



In[ ]:=
```
Table[LineGraph[CompleteKaryTree[n, 3]], {n, 2, 5}]
```
表格 线图 完全k叉树

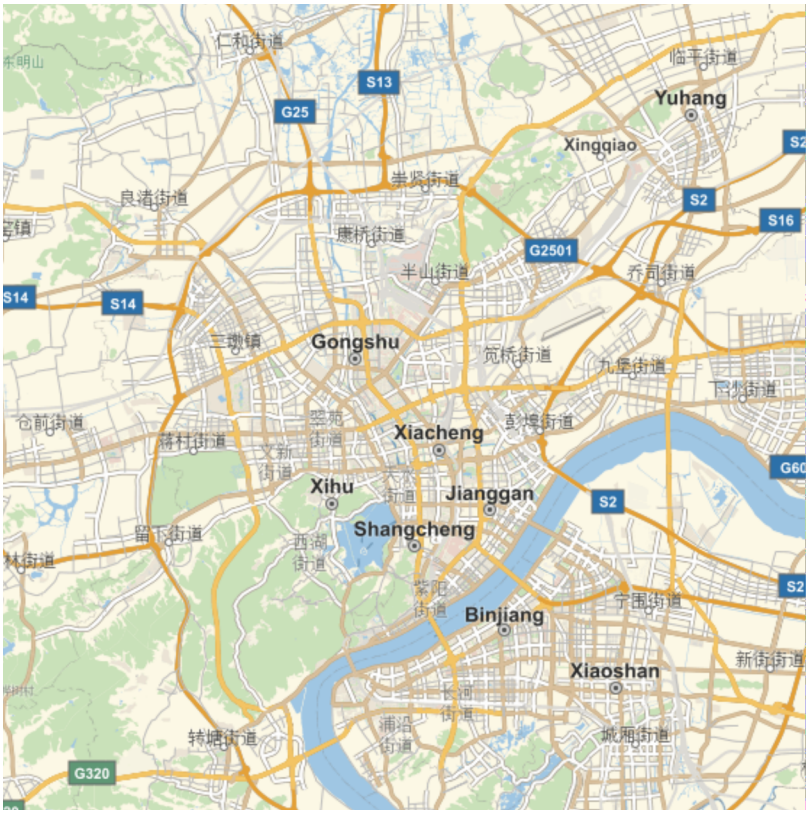
Out[ ]=



Addition

In[ ]:= `GeoGraphics[]`
地理图形

Out[ ]=



In[ ]:= `MorphologicalComponents[`  `] // Colorize`
形态学分量 着色

Out[ ]=

In[ ]:= `Group of 8 COUNTRIES [ capital city ]`

Out[ ]=

{ Ottawa , Paris , Berlin , Rome , Tokyo , Moscow , London , Washington }

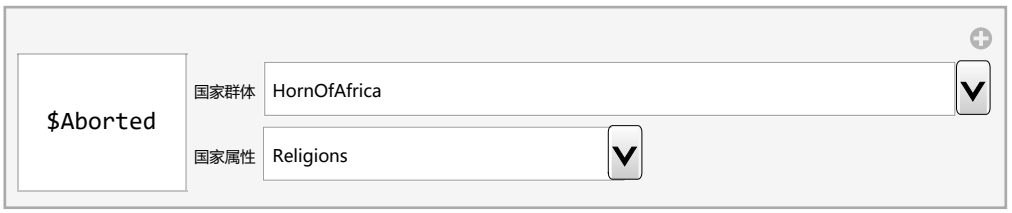
In[ ]:=
```
Grid[{#, WeatherData[#, "Temperature"]} & /@
 Group of 8 COUNTRIES[capital city], Frame → All]
```
格子 气象数据 边框 全部

Out[ ]=

Ottawa	8.99999 °C
Paris	18 °C
Berlin	5.99999 °C
Rome	26 °C
Tokyo	20 °C
Moscow	15 °C
London	15 °C
Washington	12.8 °C

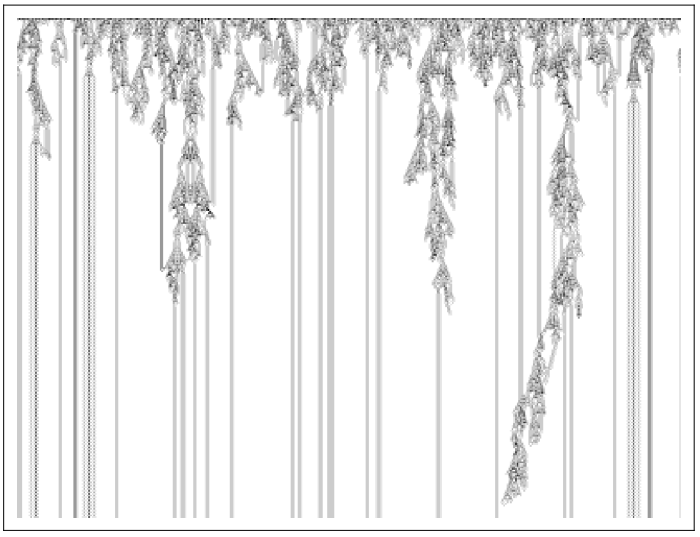
In[ ]:=
```
在世界地图中的图形 国家群体
```

Out[ ]=



In[ ]:=
```
GameOfLife = {224, {2, {{2, 2, 2}, {2, 1, 2}, {2, 2, 2}}}, {1, 1}};
ArrayPlot[Mean /@ CellularAutomaton[GameOfLife, RandomInteger[1, {10, 400}], 300]]
```
图示数组 平均值 元胞自动机 伪随机整数

Out[ ]=



In[ ]:=
```
Array[PrimeQ, 100]
```
数组 素数判定

Out[ ]=
```
{False, True, True, False, True, False, True, False, False, False, True, False, True,
 False, False, False, True, False, True, False, False, False, True, False, False, False,
 False, False, True, False, True, False, False, False, False, False, True, False, False,
 False, True, False, True, False, False, False, True, False, False, False, False, False,
 True, False, False, False, False, False, True, False, True, False, False, False,
 False, False, True, False, False, False, True, False, True, False, False, False,
 False, False, True, False, False, False, True, False, False, False, False, False,
 True, False, False, False, False, False, False, False, True, False, False, False}
```

In[ ]:=
```
Boole[%143]
```
布尔

Out[ ]=
```
{0, 1, 1, 0, 1, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1,
 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 0,
 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 0,
 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0}
```

In[ ]:=
```
Total[%144]
```
总计

Out[ ]=
```
25
```

```
(*draw a sky blue dodecahedron and two orange spheres*)

Graphics3D[
```
三维图形
```
 {{ColorData["HTML"]["SkyBlue"], PolyhedronData["Dodecahedron", "GraphicsComplex"]},
```
颜色数据 多面体数据 十二面体 复形图
```
  Table[Translate[{Orange, Sphere[{0, 0, 0}, 1]}, {2 * n, 0, 0}], {n, 0, 1}]}]
```
表格 平移 橙色 球体

Out[ ]=