# Harper — 2025-01-17 — PS 1

In[296]:=

**1 + 2 + 3**

Out[296]=

6

In[297]:=

**1 + 2 + 3 + 4 + 5**

Out[297]=

15

In[298]:=

**1 * 2 * 3 * 4 * 5**

Out[298]=

120

In[299]:=

**5 ^ 2**

Out[299]=

25

In[300]:=

**3 ^ 4**

Out[300]=

81

In[301]:=

**10 ^ 12**

Out[301]=

1 000 000 000 000

In[302]:=

**3 ^ (7 * 8)**

Out[302]=

523 347 633 027 360 537 213 511 521

In[303]:=

**(4 − 2) * (3 + 4)**

Out[303]=

14

In[304]:=

**29 000 * 73**

Out[304]=

2 117 000

In[305]:=

**−3 + −2 + −1 + 0 + 1 + 2 + 3**

Out[305]=

0

In[306]:=
```
24 / 3
```
Out[306]=
8

In[307]:=
```
5 ^ 100
```
Out[307]=
7 888 609 052 210 118 054 117 285 652 827 862 296 732 064 351 090 230 047 702 789 306 640 625

In[308]:=
```
100 - 5 ^ 2
```
Out[308]=
75

In[309]:=
```
6 * 5 ^ 2 + 7
```
Out[309]=
157

In[310]:=
```
3 ^ 2 - 2 ^ 3
```
Out[310]=
1

In[311]:=
```
2 ^ 3 * 3 ^ 2
```
Out[311]=
72

In[312]:=
```
2 (8 + -11)
```
Out[312]=
-6

## 2 | Introducing Functions

In[313]:=
```
Plus[7, 6, 5]
```
Out[313]=
18

In[314]:=
```
Times[2, Plus[3, 4]]
```
Out[314]=
14

In[315]:=
```
14
```
Out[315]=
14

In[316]:=
```
Max[6 * 8, 5 * 9]
```
Out[316]=
```
48
```

In[317]:=
```
RandomInteger[100]
```
Out[317]=
```
58
```

In[318]:=
```
RandomInteger[{10, 20}]
```
Out[318]=
```
16
```

In[319]:=
```
Times[5, 4, 3, 2]
```
Out[319]=
```
120
```

In[320]:=
```
Subtract[2, 3]
```
Out[320]=
```
-1
```

In[321]:=
```
Times[Plus[7, 8], Plus[9, 2]]
```
Out[321]=
```
165
```

In[322]:=
```
Divide[Subtract[26, 89], 9]
```

Out[322]=
```
-7
```

In[323]:=
```
Subtract[100, Power[5, 2]]
```
Out[323]=
```
75
```

In[324]:=
```
Max[3^5, 5^3]
```
Out[324]=
```
243
```

In[325]:=
```
3 * Max[4^3, 3^4]
```
Out[325]=
```
243
```

In[326]:=

```
RandomInteger[1000] + RandomInteger[1000]
```

Out[326]=

848

## 3 | First Look at Lists

In[327]:=

```
Range[4]
```

Out[327]=

{1, 2, 3, 4}

In[328]:=

```
Range[100]
```

Out[328]=

{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42,
 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62,
 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81,
 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100}

In[329]:=

```
Reverse[Range[4]]
```

Out[329]=

{4, 3, 2, 1}

In[330]:=

```
Reverse[Range[50]]
```

Out[330]=

{50, 49, 48, 47, 46, 45, 44, 43, 42, 41, 40, 39, 38, 37,
 36, 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20,
 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1}

In[331]:=

```
Join[Range[4], Reverse[Range[4]]]
```

Out[331]=

{1, 2, 3, 4, 4, 3, 2, 1}

In[332]:=
```mathematica
ListPlot[Join[Range[100], Reverse[Range[100]]]]
```

Out[332]=
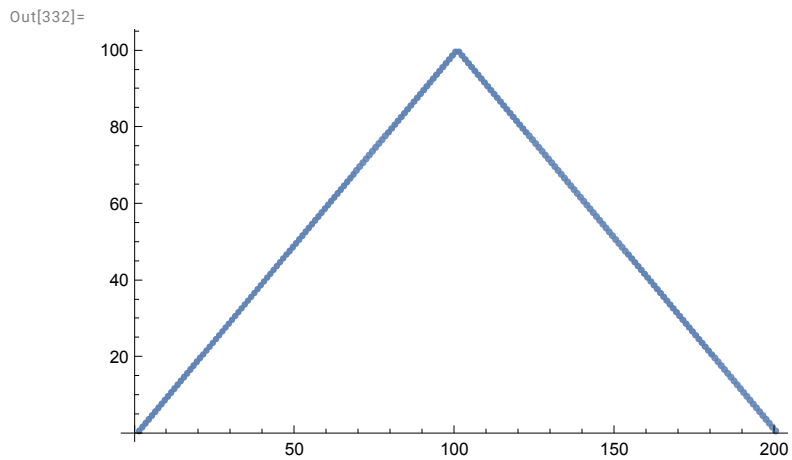


In[333]:=
```mathematica
Range[RandomInteger[10]]
```

Out[333]=

{1, 2, 3}

In[334]:=
```mathematica
Range[10]
```

Out[334]=

{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

In[335]:=
```mathematica
Range[5]
```

Out[335]=

{1, 2, 3, 4, 5}

In[336]:=
```mathematica
Join[Range[10], Range[10], Range[5]]
```

Out[336]=

{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 1, 2, 3, 4, 5}

In[337]:=
```mathematica
Join[Range[20], Reverse[Range[20]]]
```

Out[337]=

{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19,
 20, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1}

In[338]:=
```mathematica
Range[4]
```

Out[338]=

{1, 2, 3, 4}

In[339]:=
```mathematica
Join[Range[4], Reverse[Range[5]]]
```

Out[339]=

{1, 2, 3, 4, 5, 4, 3, 2, 1}

In[340]:=

```
Reverse[Join[Range[5], Range[4], Range[3]]]
```

Out[340]=

{3, 2, 1, 4, 3, 2, 1, 5, 4, 3, 2, 1}

In[341]:=

```
ListPlot[{10, 11, 12, 13, 14}]
```

Out[341]=
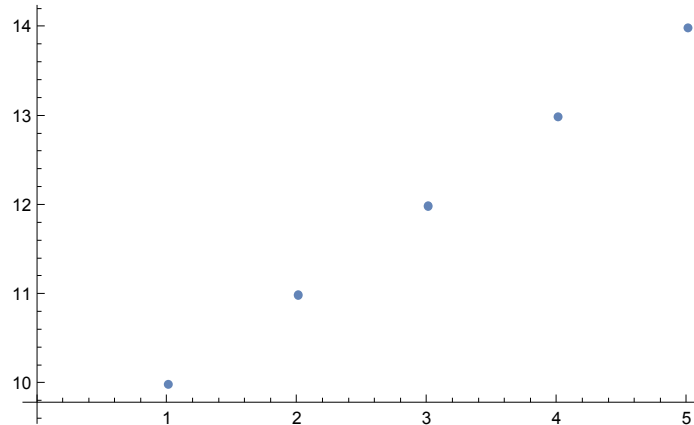


In[342]:=

```
Join[Range[10], Reverse[Range[10]], Range[10]]
```

Out[342]=

{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

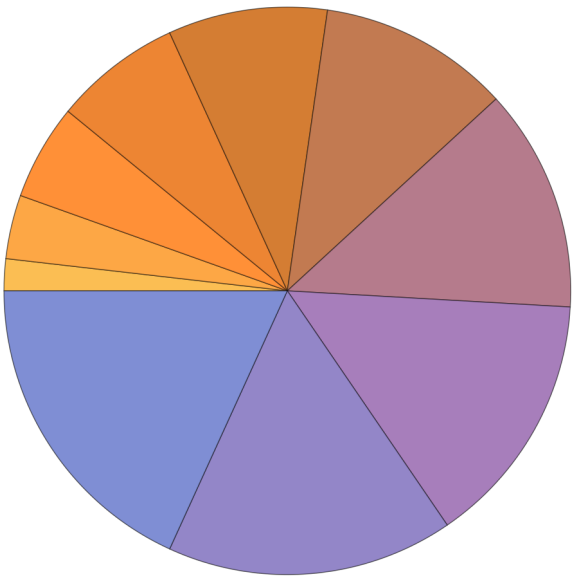## 4 | Displaying Lists

In[343]:=

```
BarChart[{1, 1, 2, 3, 5}]
```
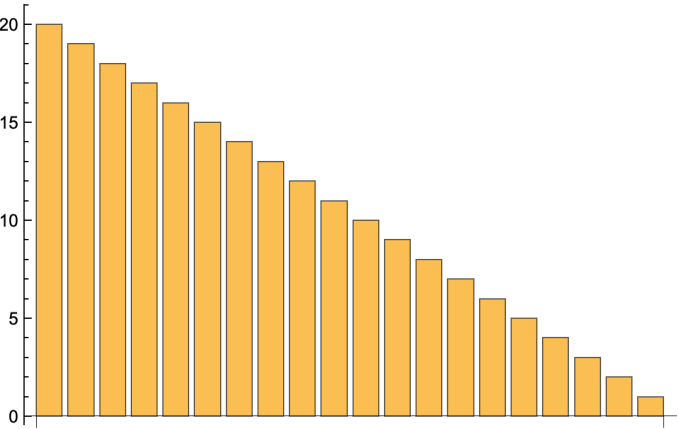
Out[343]=
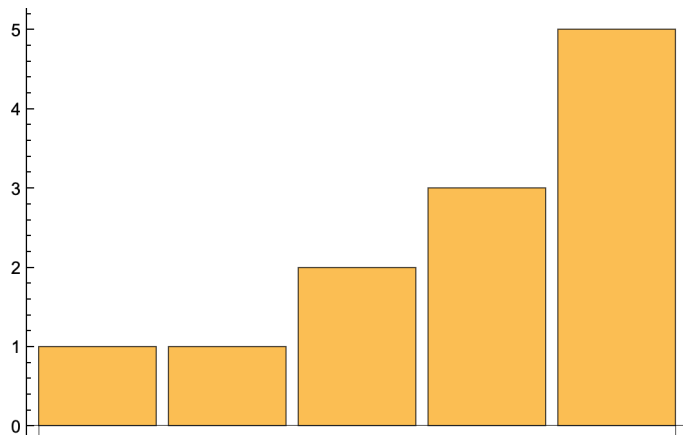
In[344]:=
```
PieChart[Range[10]]
```

Out[344]=



In[345]:=
```
BarChart[Reverse[Range[20]]]
```

Out[345]=



In[346]:=
```
Column[Range[5]]
```

Out[346]=

1
2
3
4
5

In[347]:=

```
NumberLinePlot[{1, 4, 9, 16, 25}]
```

Out[347]=
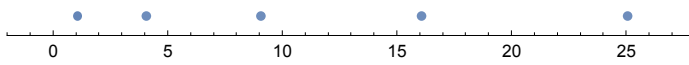


In[348]:=

```
PieChart[{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1}]
```
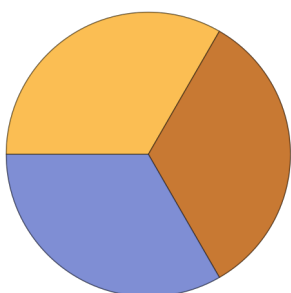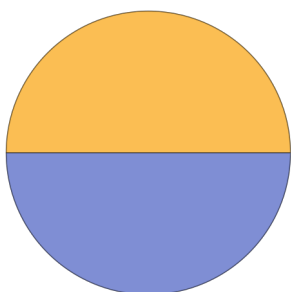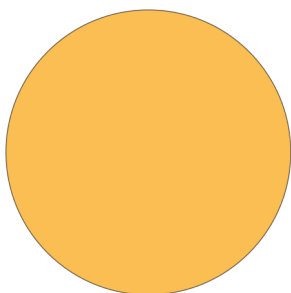
Out[348]=
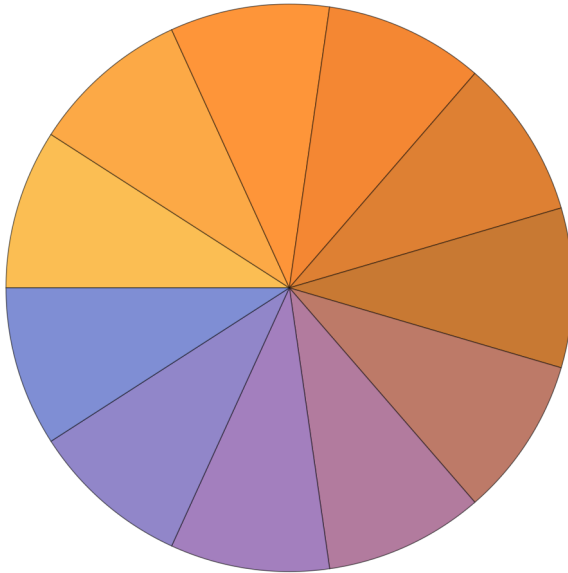
In[349]:=
```
Column[{PieChart[{1}], PieChart[{1, 1}], PieChart[{1, 1, 1}]}]
```
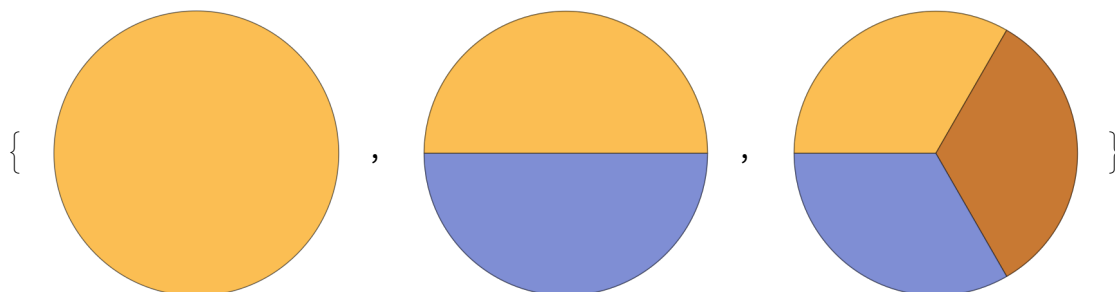
Out[349]=



In[350]:=
```
{PieChart[{1}], PieChart[{1, 1}], PieChart[{1, 1, 1}]}]
```
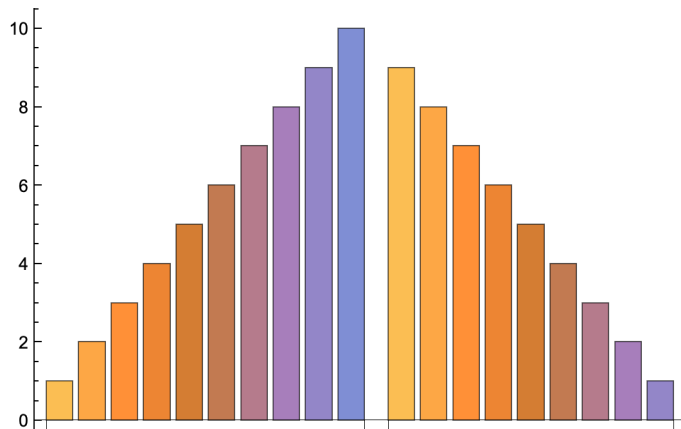
Out[350]=

In[351]:=

In[352]:=

In[353]:=
```
BarChart[{Range[10], Reverse[Range[9]]}]
```
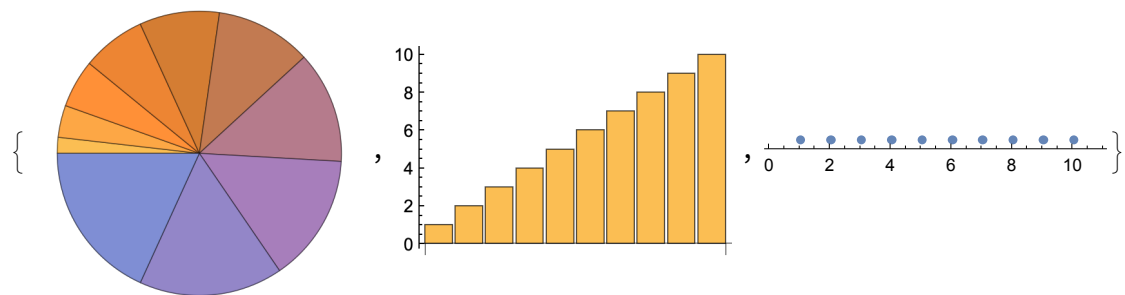
Out[353]=



In[354]:=
```
{PieChart[Range[10]], BarChart[Range[10]], NumberLinePlot[Range[10]]}
```
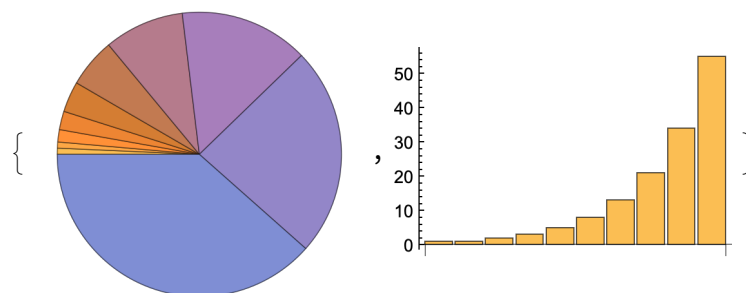
Out[354]=



In[355]:=
```
{PieChart[{1, 1, 2, 3, 5, 8, 13, 21, 34, 55}],
 BarChart[{1, 1, 2, 3, 5, 8, 13, 21, 34, 55}]}
```
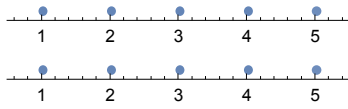
Out[355]=

In[356]:=
```
Column[{NumberLinePlot[Range[5]], NumberLinePlot[Range[5]]}]
```
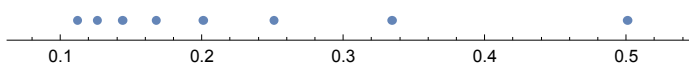
Out[356]=



In[357]:=
```
NumberLinePlot[{1 / 2, 1 / 3, 1 / 4, 1 / 5, 1 / 6, 1 / 7, 1 / 8, 1 / 9}]
```

Out[357]=



In[358]:=

In[359]:=