Hexi—PS20—2025 - 04 - 22

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Due to getting a little behind in the final two weeks of the semester, I only checked for completeness on PS 18-21. ~Brian

Exercises from EIWL3 Section 45

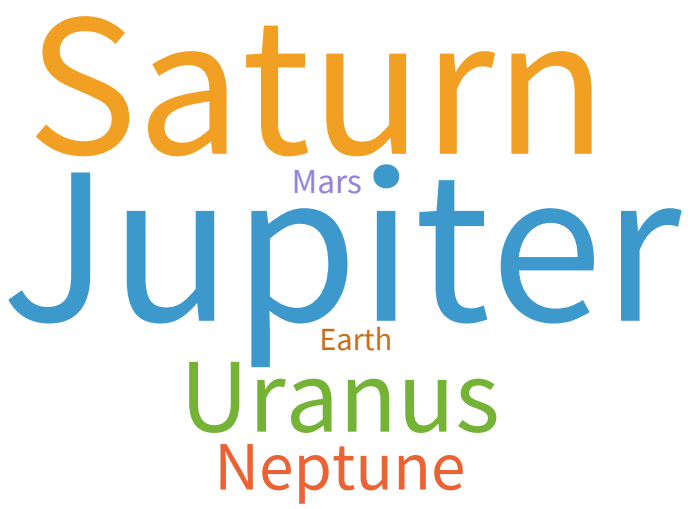
In[ ]:=
```
planets = CloudGet["https://wolfr.am/7FxLgPm5"]
```

Out[ ]=

	Mass	Radius	Moons		
				Mass	Radius
Mercury	3.30104×10^{23} kg	1516.0 mi			
Venus	4.86732×10^{24} kg	3760.4 mi			
Earth	5.9721986×10^{24} kg	3958.761 mi	Moon	7.3459×10^{22} kg	1079.6 mi
Mars	6.41693×10^{23} kg	2106.1 mi	Deimos	1.5×10^{15} kg	3.9 mi
			Phobos	1.072×10^{16} kg	6.90 mi
Jupiter	1.89813×10^{27} kg	43 441. mi	Adrastea	$7. \times 10^{15}$ kg	5.1 mi
			Aitne	$4. \times 10^{13}$ kg	0.93 mi
			69 total ›		
Saturn	5.68319×10^{26} kg	36 184. mi	Aegaeon	—	0.16 mi
			Aegir	—	1.9 mi
			62 total ›		
Uranus	8.68103×10^{25} kg	15 759. mi	Ariel	1.35×10^{21} kg	359.7 mi
			Belinda	3.57×10^{17} kg	25.0 mi
			27 total ›		
Neptune	1.02410×10^{26} kg	15 299. mi	Despina	2.1×10^{18} kg	47. mi
			Galatea	3.7×10^{18} kg	55. mi
			14 total ›		

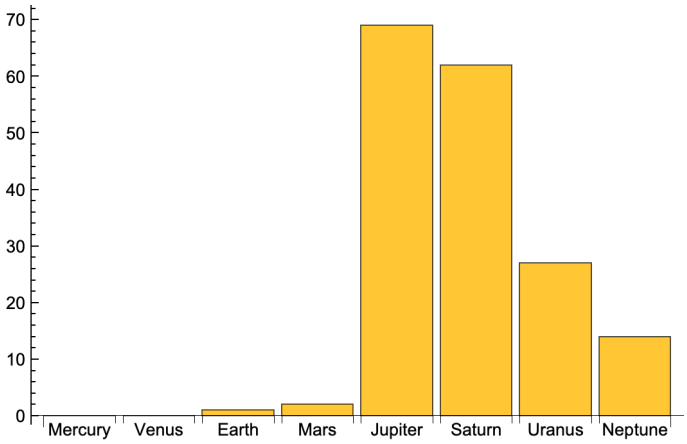
In[•]:=
```
Normal[planets[All, "Moons", Length]] // WordCloud
```

Out[•]=



In[•]:=
```
BarChart[Normal[planets[All, "Moons", Length]], ChartLabels → Automatic]
```

Out[•]=



In[•]:=
```
planets[SortBy[Length[#Moons] &], "Mass"]
```

Out[•]=

Mercury	3.30104×10^{23} kg
Venus	4.86732×10^{24} kg
Earth	5.9721986×10^{24} kg
Mars	6.41693×10^{23} kg
Neptune	1.02410×10^{26} kg
Uranus	8.68103×10^{25} kg
Saturn	5.68319×10^{26} kg
Jupiter	1.89813×10^{27} kg

In[•]:=
```
planets[All, "Moons", Max, "Mass"]
```

Out[•]=

Mercury	$-\infty$
Venus	$-\infty$
Earth	7.3459×10^{22} kg
Mars	1.072×10^{16} kg
Jupiter	1.4815×10^{23} kg
Saturn	1.3452×10^{23} kg
Uranus	3.526×10^{21} kg
Neptune	2.1394×10^{22} kg

In[•]:=
```
Sort[planets[All, "Moons", Total, "Mass"]]
```

Out[•]=

Mercury	0
Venus	0
Mars	1.22×10^{16} kg
Uranus	9.14×10^{21} kg
Neptune	2.1487×10^{22} kg
Earth	7.3459×10^{22} kg
Saturn	1.4051×10^{23} kg
Jupiter	3.9301×10^{23} kg

In[•]:=
```
planets[All, "Moons", Median, "Mass"]
```

Out[•]=

Mercury	—
Venus	—
Earth	7.3459×10^{22} kg
Mars	6.10×10^{15} kg
Jupiter	1.9×10^{14} kg
Saturn	8.2×10^{15} kg
Uranus	3.57×10^{17} kg
Neptune	3.7×10^{18} kg

In[•]:=
```
planets[All, "Moons", Select[#Mass > 0.0001 M⊕ &]][All, Keys]
```

Out[•]=

Mercury	{}
Venus	{}
Earth	{Moon}
Mars	{}
Jupiter	{Callisto, Europa, Ganymede, Io}
Saturn	{Dione, Iapetus, Rhea, Tethys, Titan}
Uranus	{Ariel, Oberon, Titania, Umbriel}
Neptune	{Triton}

In[•]:=
```
countries = Central America COUNTRIES ["Name"];
lengths = StringLength[WikipediaData[#]] & /@ countries;
countriesdata = AssociationThread[countries → lengths];
WordCloud[countriesdata]
```

Out[•]=

In[•]:=
```
fireballs = ResourceData["Fireballs and Bolides"];
fireballs[Max, "Altitude"]
```

Out[•]=

66.6 km

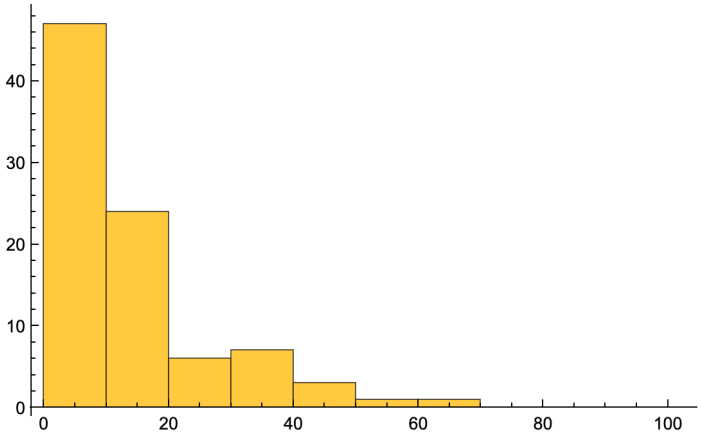
In[•]:=
```
Take[ReverseSort[fireballs[All, "Altitude"]], 5]
```

Out[•]=

66.6 km
59.3 km
50 km
45.5 km
44 km

In[•]:=
```
Differences[fireballs[All, "PeakBrightness"]] // Histogram
```

Out[•]=



In[•]:=
```
GeoListPlot[Take[fireballs, {1, 10}][All, "NearestCity"], GeoLabels → True]
```

Out[•]=

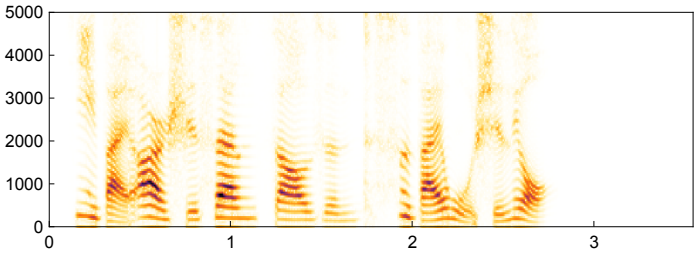
In[•]:=
```
GeoListPlot[
 fireballs[TakeLargestBy[#Altitude &, 10], "NearestCity"], GeoLabels → True]
```

Out[•]=

Exercises from EIWL3 Section 46

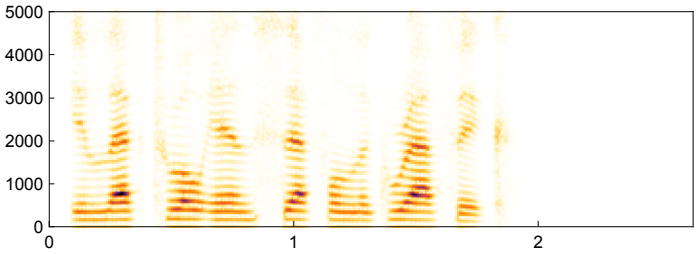
In[•]:=
```
Spectrogram[SpeechSynthesize[IntegerName[123 456]]]
```

Out[•]=



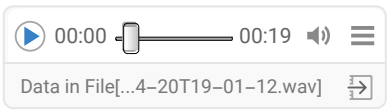
In[•]:=
```
Spectrogram[SpeechSynthesize[ReverseSortBy[WordList[], StringLength][[1]]]]
```

Out[•]=



In[•]:=
```
SpeechSynthesize[StringRiffle[Alphabet[], Nothing]]
```

Out[•]=



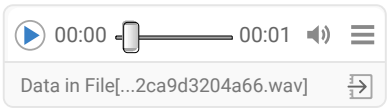
In[•]:=
```
StringRiffle[Alphabet[], Nothing]
```

Out[•]=

```
{a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z}
```

In[ ]:=
```
AudioPitchShift[SpeechSynthesize["hello"], 2]
```

Out[ ]=



In[ ]:=
```
Table[SpeechRecognize[AudioPitchShift[SpeechSynthesize["computer"], n]],
 {n, 1, 1.5, 0.1}]
```

Out[ ]=

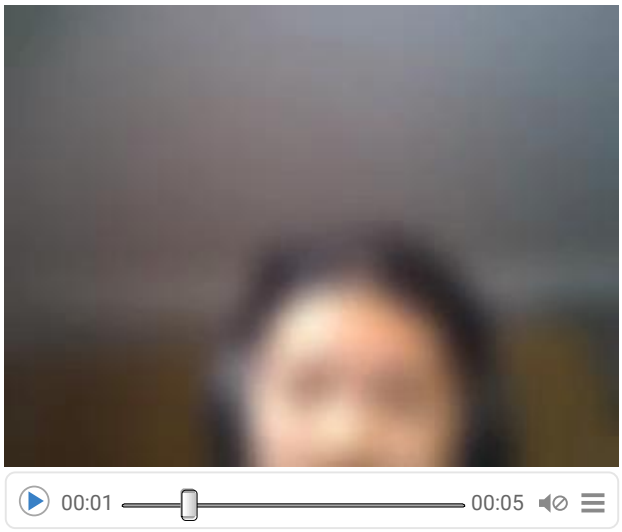
```
{computer, computer, computer, come pure day, compure day, comple}
```

```
(*Sound[SoundNote[#,1,"Guitar"]&/@{0,12,24}]//
 AudioPlot.This does not work on my laptop.*)
```

```
(*Table[AudioPitchShift[Sound[SoundNote[0,1,"Trumpet"]],n],{n,0.5,1,0.1}]//
 AudioIdentify This does not work on my laptop.*)
```

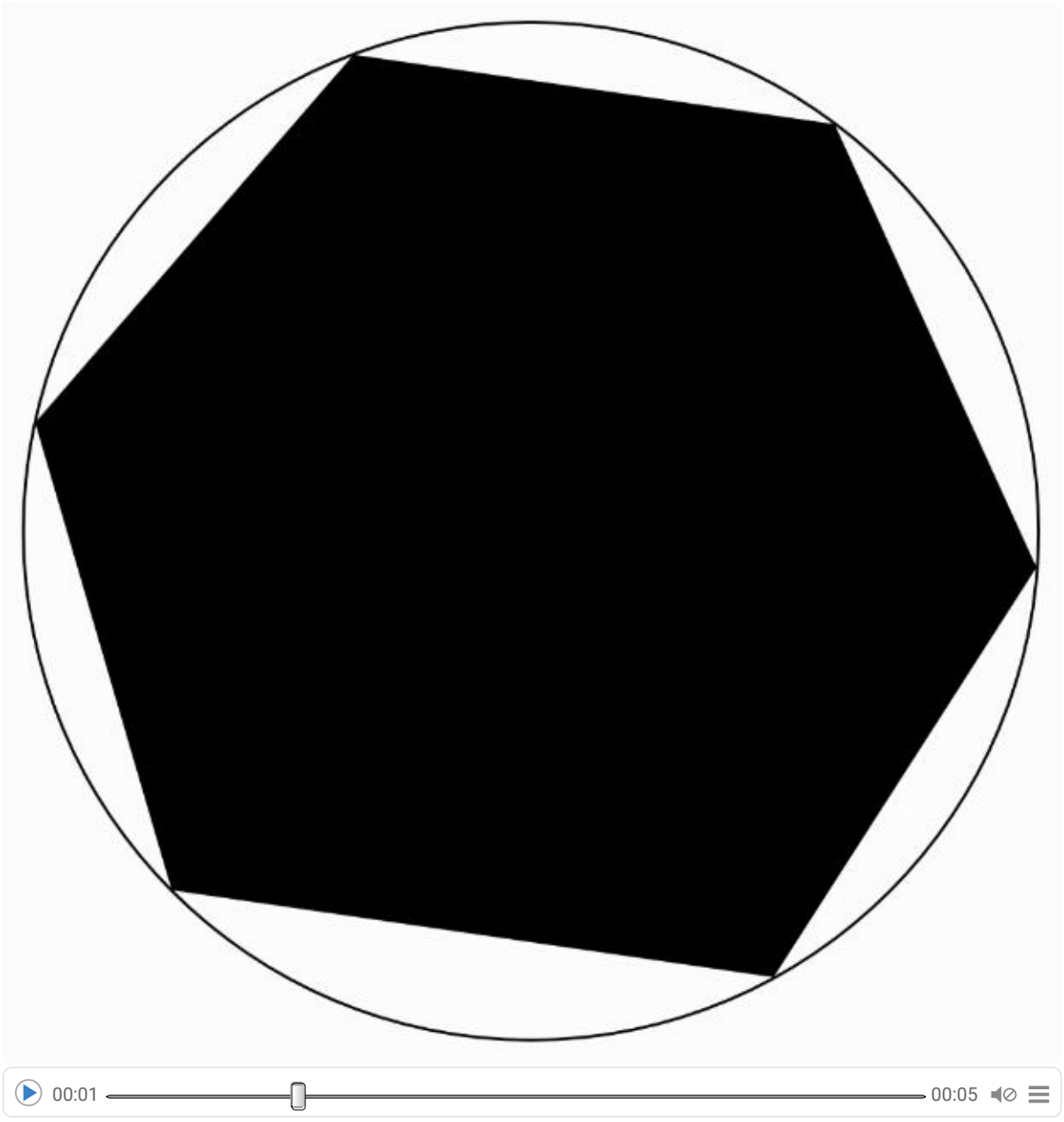
In[ ]:=
```
AnimationVideo[Blur[CurrentImage[], n], {n, 20, 0}]
```

Out[ ]=



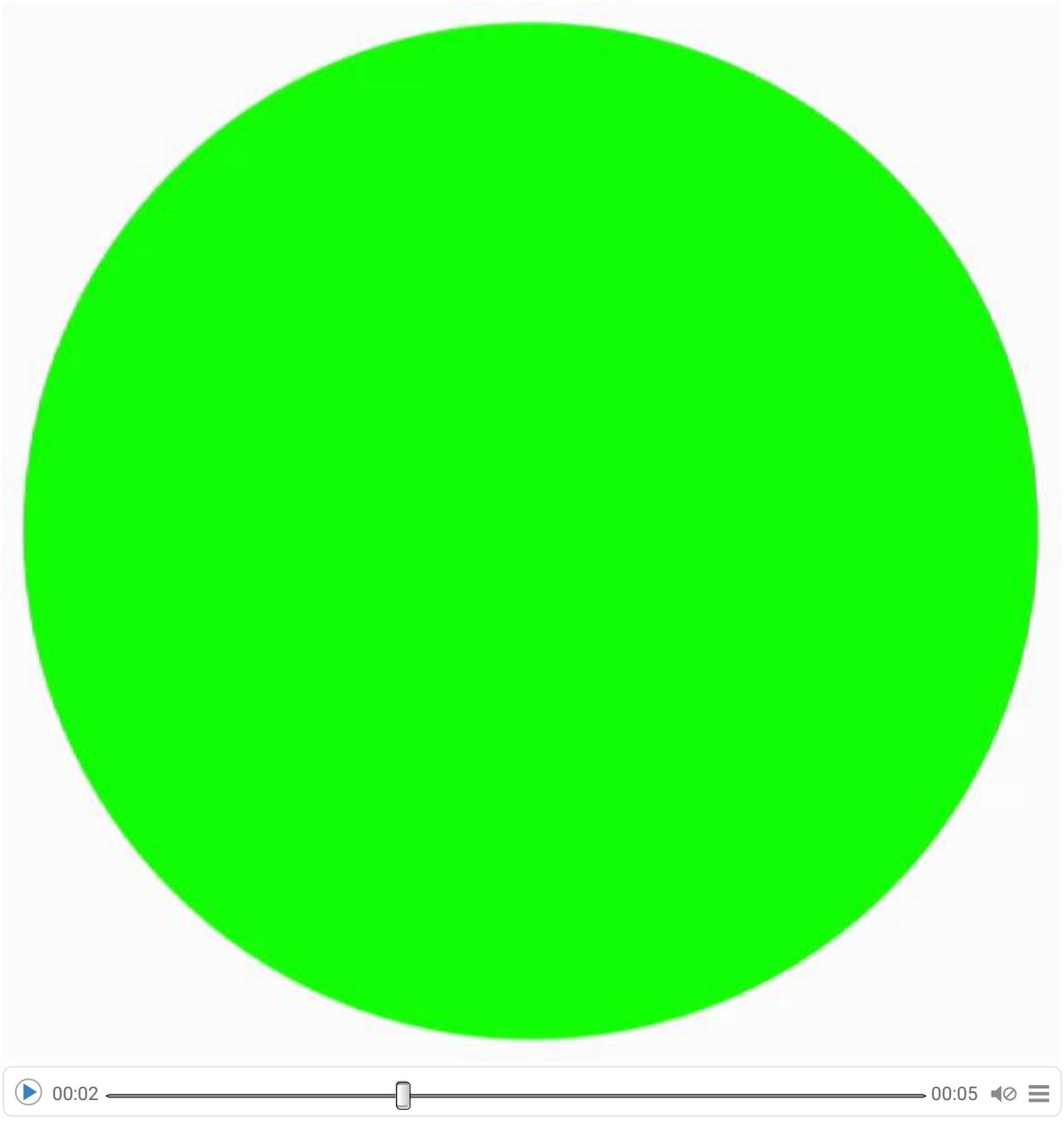
In[ ]:=
```
AnimationVideo[Graphics[{RegularPolygon[n], Circle[]}], {n, 3, 20}]
```

Out[ ]=



In[ ]:=
```
AnimationVideo[Graphics[{Hue[n], Disk[], ImageSize → 50}], {n, 0, 1}]
```

Out[ ]=



In[•]:=
```
AnimationVideo[
 Rasterize[ToUpperCase[FromLetterNumber[n]], RasterSize → 200], {n, 1, 26, 1}]
```

Out[•]=