

Brian — PS 3 — 2025-01-24 — Solution

Exercises from EWL3 Section 9

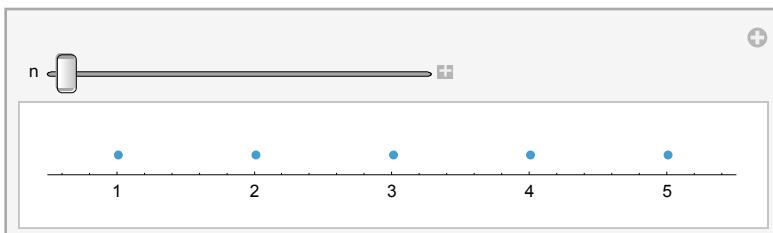
```
(* 9.1 *) Manipulate[Range[n], {n, 0, 100, 1}]
```

Out[*o*] =



```
(* 9.2 *) Manipulate[NumberLinePlot[Range[n]], {n, 5, 50, 1}]
```

Out[*o*] =



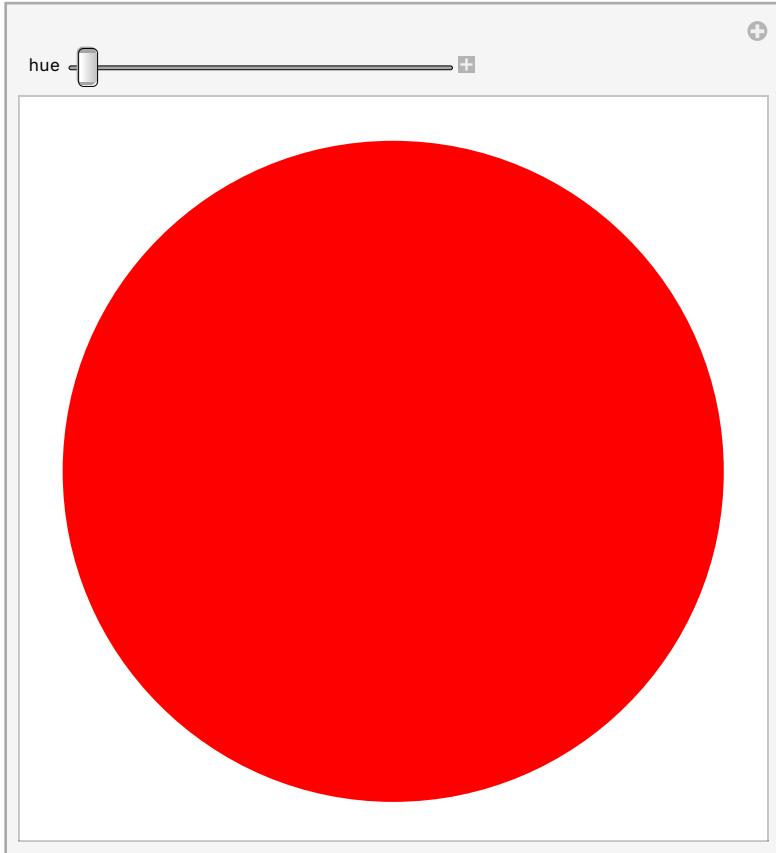
```
(* 9.3 *) Manipulate[Column[Table[x, n]], {n, 1, 10, 1}]
```

Out[*o*] =



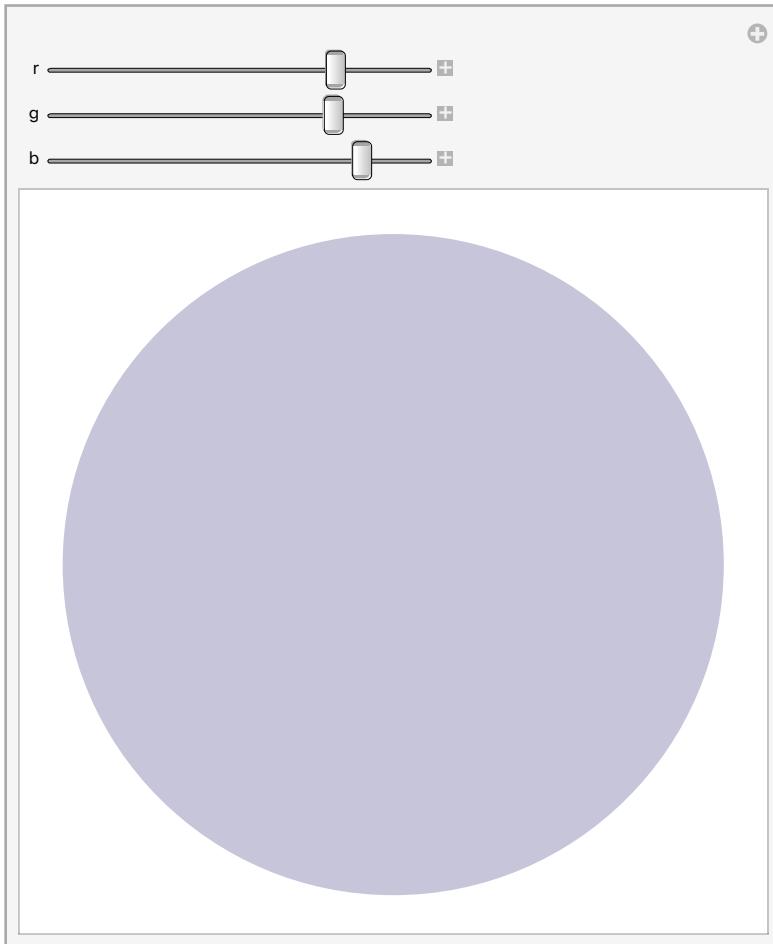
```
(* 9.4 *) Manipulate[Graphics[Style[Disk[], Hue[hue]], {hue, 0, 1}]
```

```
Out[=]=
```



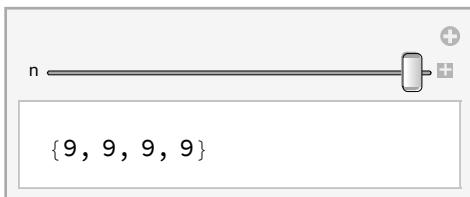
```
(* 9.5 *) Manipulate[  
  Graphics[Style[Disk[], RGBColor[r, g, b]]], {r, 0, 1}, {g, 0, 1}, {b, 0, 1}]
```

Out[•]=



```
(* 9.6 *) Manipulate[IntegerDigits[n], {n, 1000, 9999, 1}]
```

Out[•]=

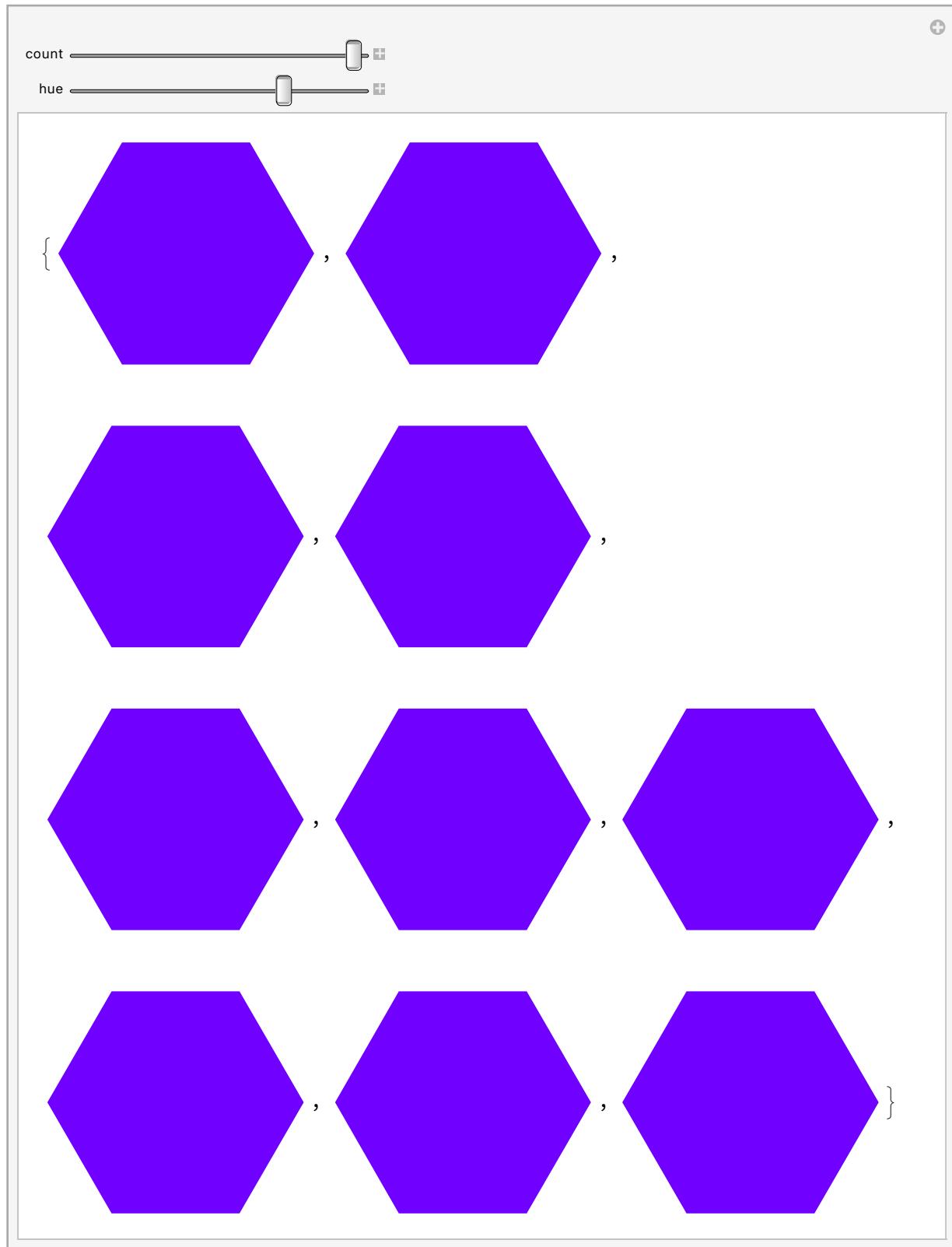


```
(* 9.7 *) Manipulate[Table[Hue[i/(n - 1)], {i, 0, n - 1}], {n, 5, 50}]  
(* Perhaps I got a bit carried away with my interpretation of equally-spaced :*)
```

Out[•]=

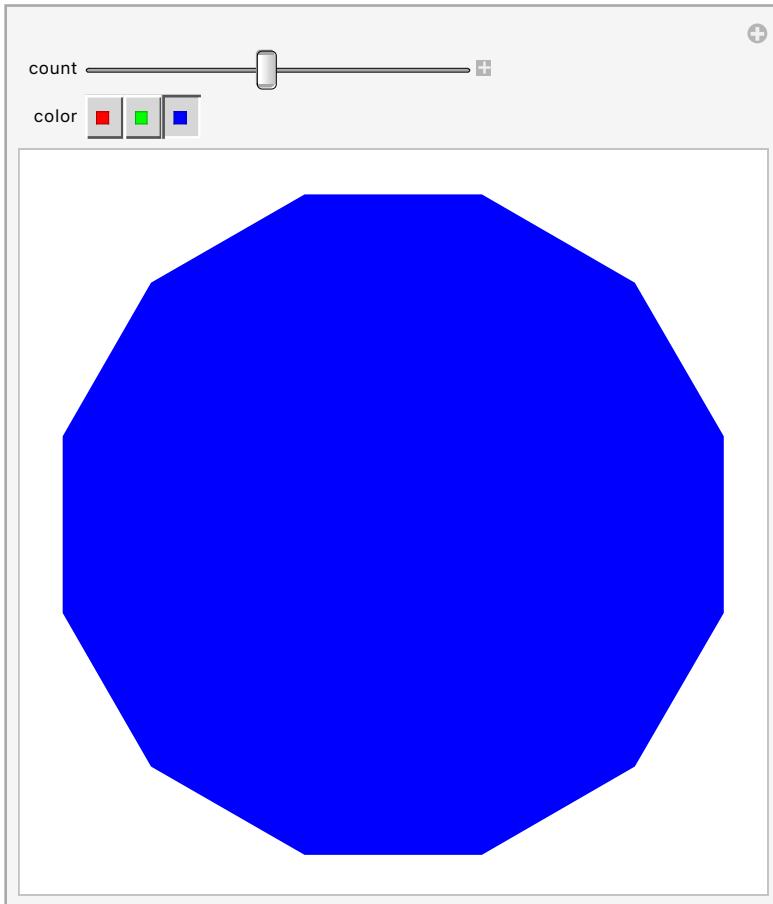


```
(* 9.8 *) Manipulate[Table[Graphics[Style[RegularPolygon[6], Hue[hue]]], count],  
{count, 1, 10, 1}, {hue, 0, 1}]
```

Out[*o*]=

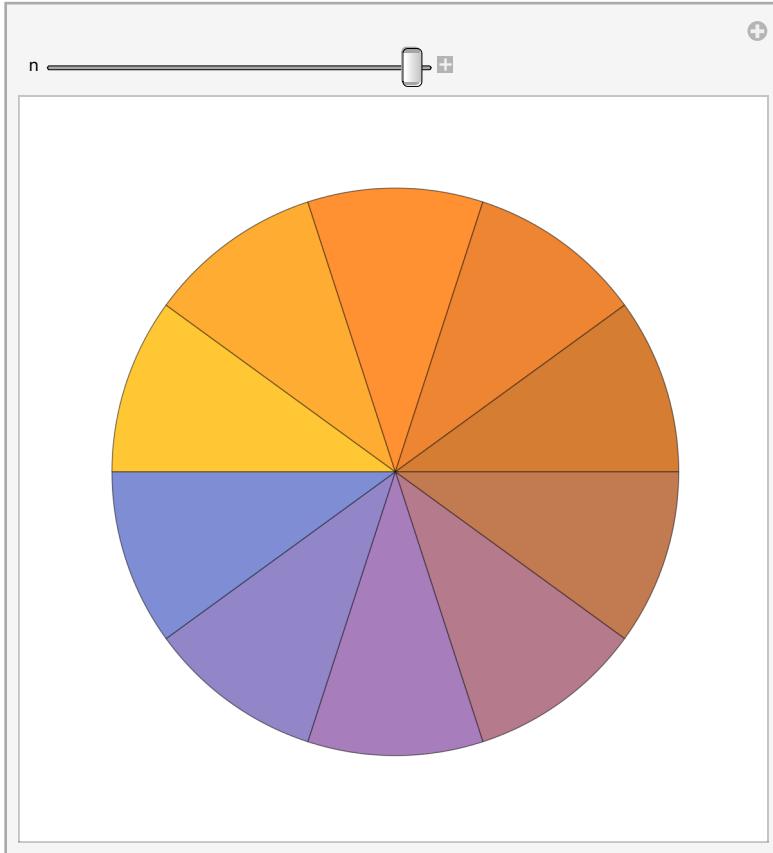
```
(* 9.9 *) Manipulate[Graphics[Style[RegularPolygon[count], color]],  
{count, 5, 20, 1}, {color, {Red, Green, Blue}}]
```

Out[•]=



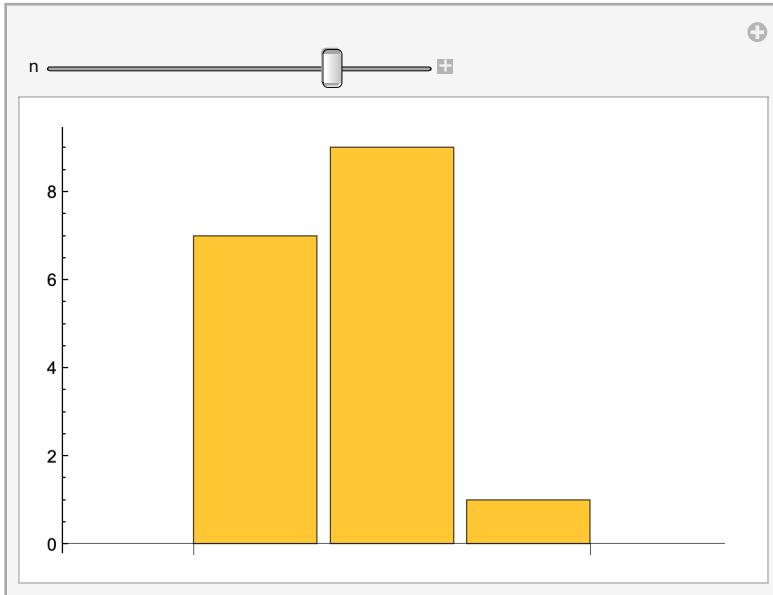
```
(* 9.10 *) Manipulate[PieChart[Table[1, n]], {n, 1, 10}]
```

Out[]=



```
(* 9.11 *) Manipulate[BarChart[IntegerDigits[n]], {n, 100, 999, 1}]
```

Out[]=



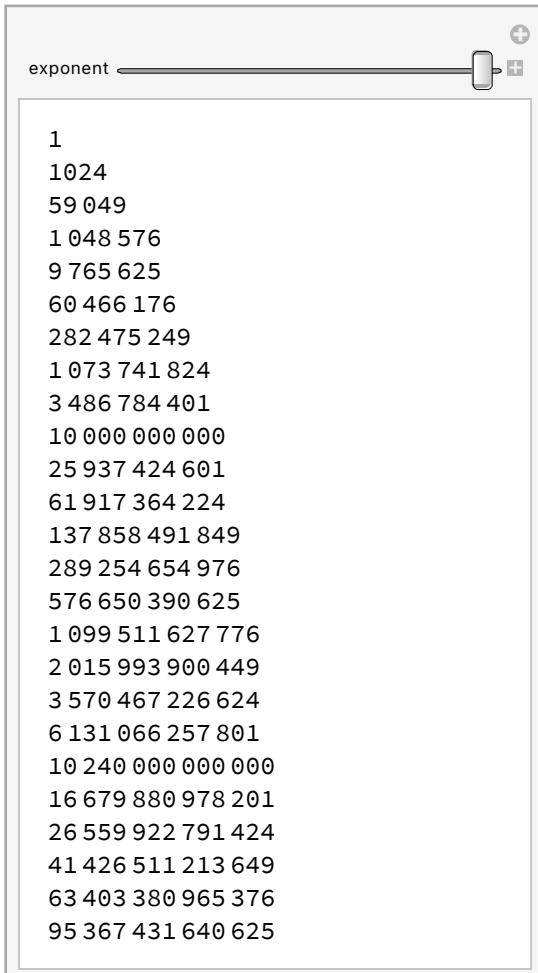
```
(* 9.12 *) Manipulate[Table[RandomColor[], n], {n, 1, 50}]
```

Out[•]=



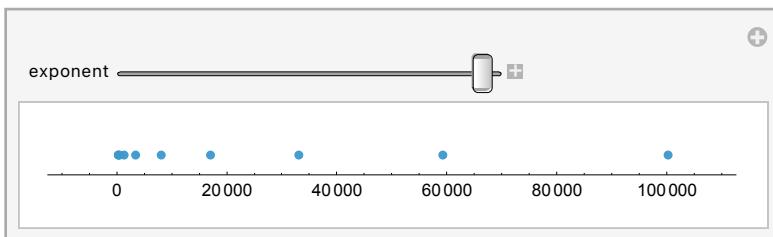
```
(* 9.13 *) Manipulate[Column[Table[base^exponent, {base, 1, 25}]], {exponent, 1, 10, 1}]
```

Out[•]=



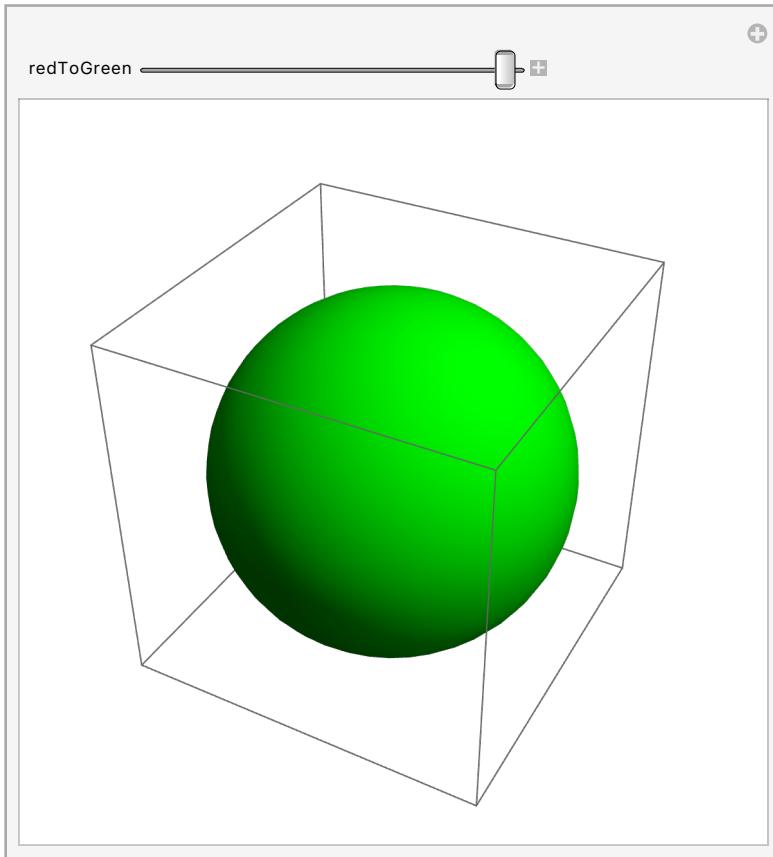
```
(* 9.14 *) Manipulate[NumberLinePlot[Range[10]^exponent], {exponent, 0, 5, 1}]
```

Out[•]=



```
(* 9.15 *) Manipulate[Graphics3D[  
  Style[Sphere[], RGBColor[1 - redToGreen, redToGreen, 0]]], {redToGreen, 0, 1}]
```

Out[•]=

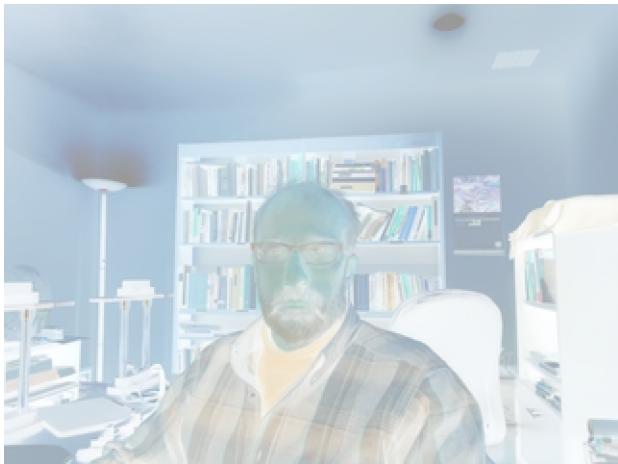


Exercises from EIWL3 Section 10

```
anImage = CurrentImage[];  
(* An image I will be re-using for lots of the exercises *)
```

```
(* 10.1 *) ColorNegate[anImage]
```

Out[76]=



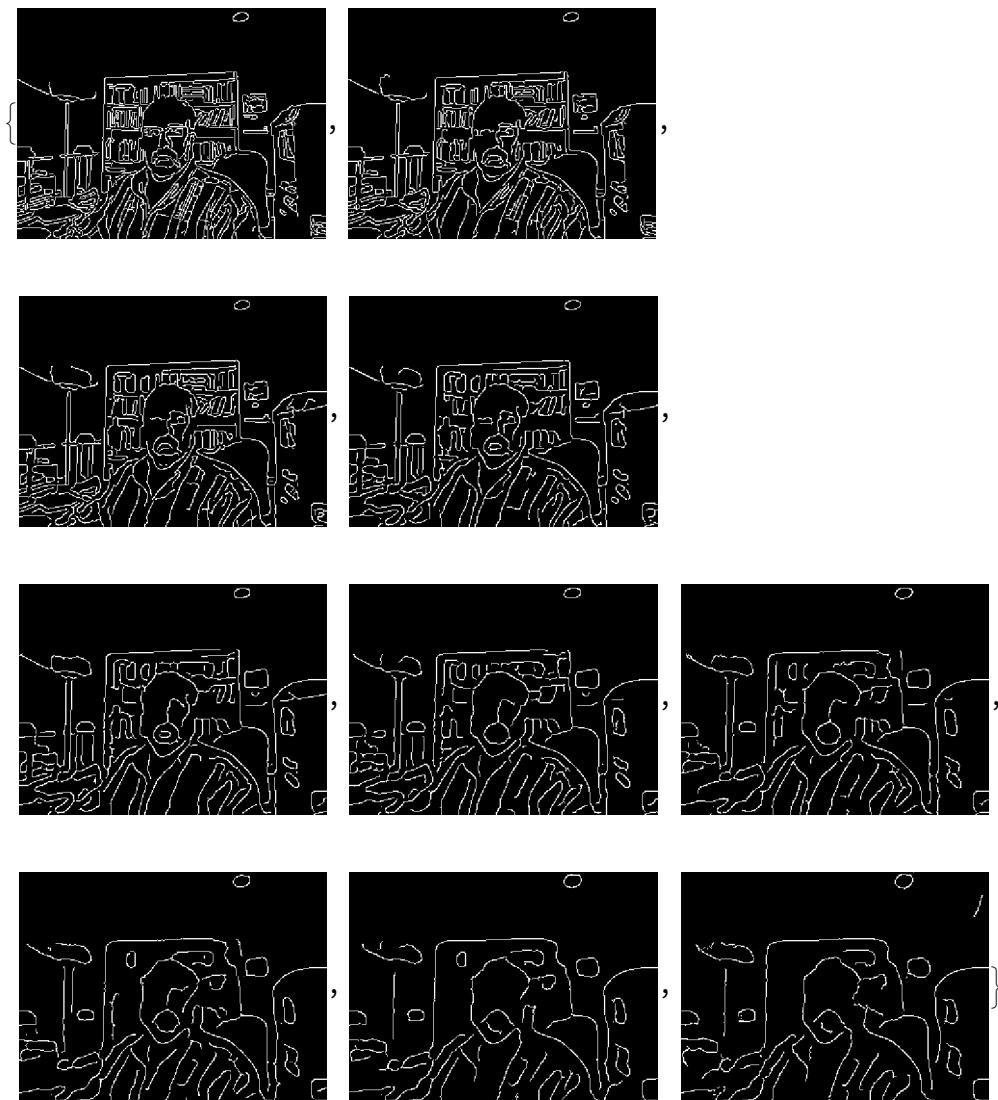
```
In[78]:= (* 10.2 *) Manipulate[Blur[anImage, blur], {blur, 0, 20}]
```

Out[78]=

A screenshot of a Mathematica Manipulate interface. At the top, there is a slider labeled "blur" with a value of 0. Below the slider is a preview window showing the same man from the previous image, but with a significant amount of blur applied, making him appear out of focus. The interface has a standard window title bar and a close button in the top right corner.

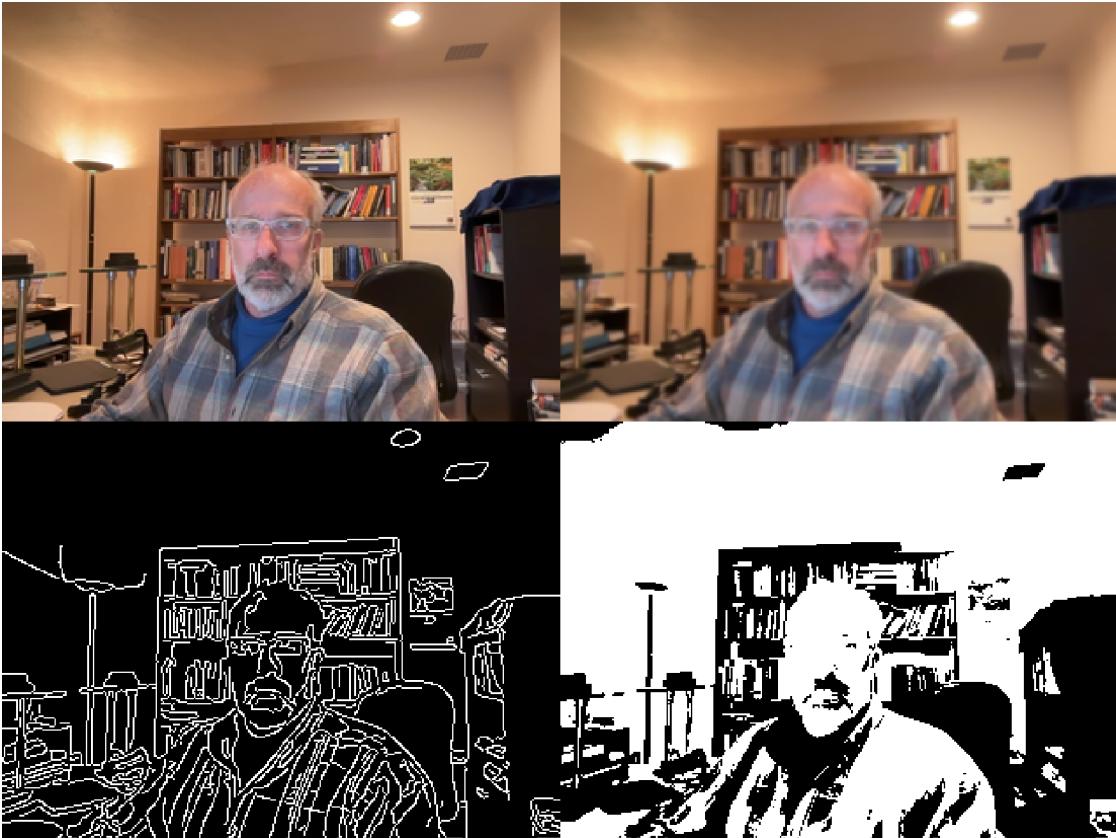
```
In[84]:= (* 10.3 *) Table[EdgeDetect[Blur[anImage, blur]], {blur, 1, 10}]
```

```
Out[84]=
```



```
In[85]:= (* 10.4 *)
ImageCollage[{anImage, Blur[anImage], EdgeDetect[anImage], Binarize[anImage]}]
```

Out[85]=



```
(* 10.5 *) anImage + Binarize[anImage]
```

Out[88]=



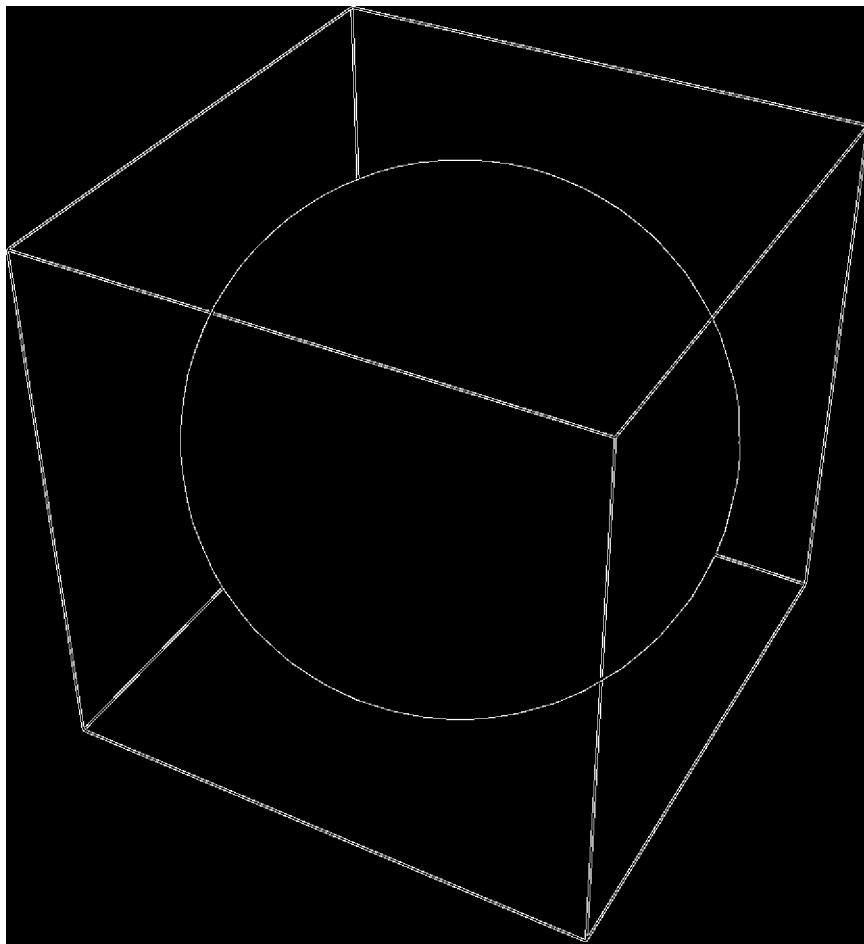
```
(* 10.6 *) Manipulate[EdgeDetect[Blur[anImage, blur]], {blur, 0, 20}]
```

Out[90]=

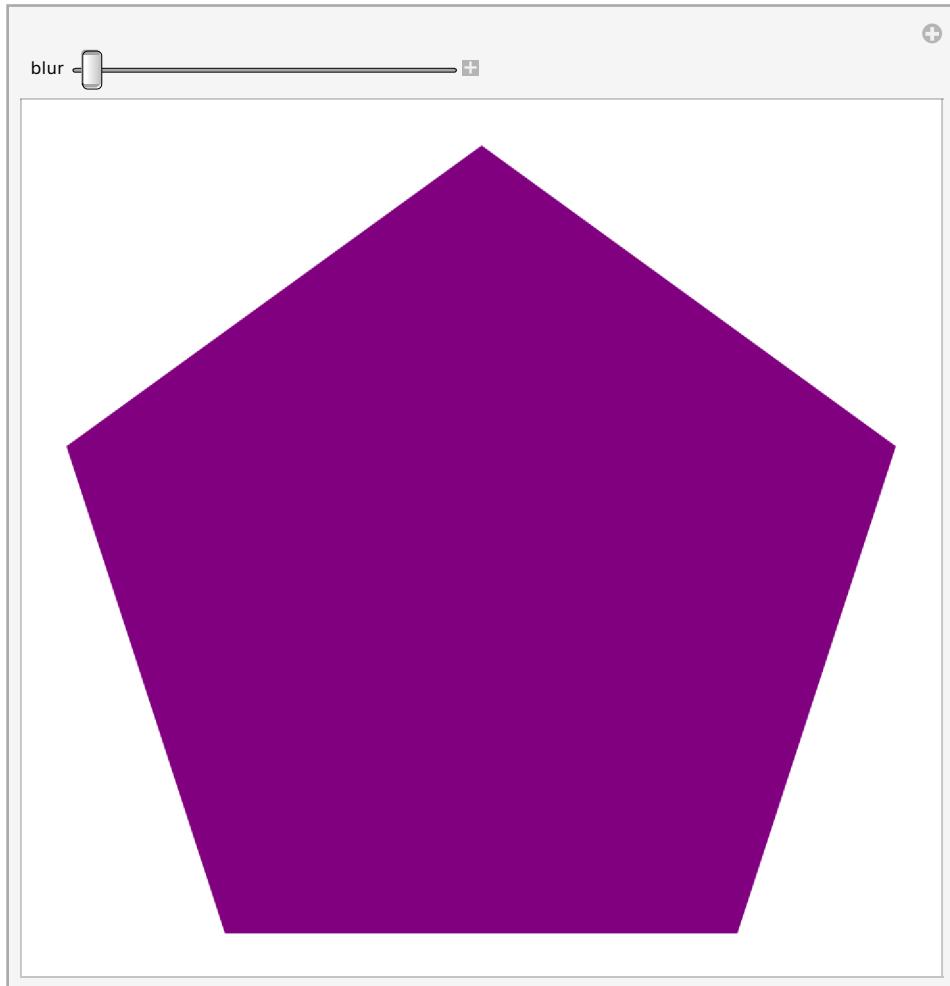


```
In[92]:= (* 10.7 *) EdgeDetect[Graphics3D[Sphere[]]]
```

```
Out[92]=
```

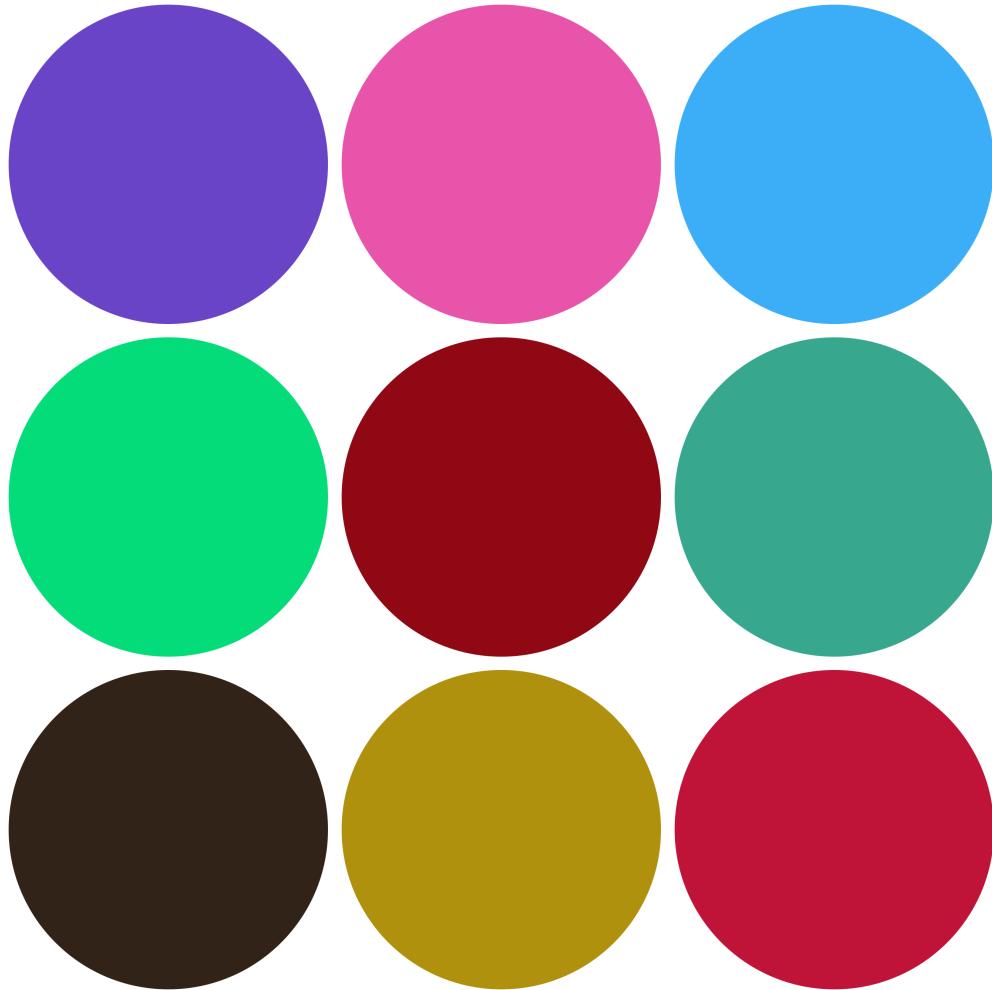


```
In[96]:= (* 10.8 *)
Manipulate[Blur[Graphics[Style[RegularPolygon[5], Purple]], blur], {blur, 0, 20}]
Out[96]=
```



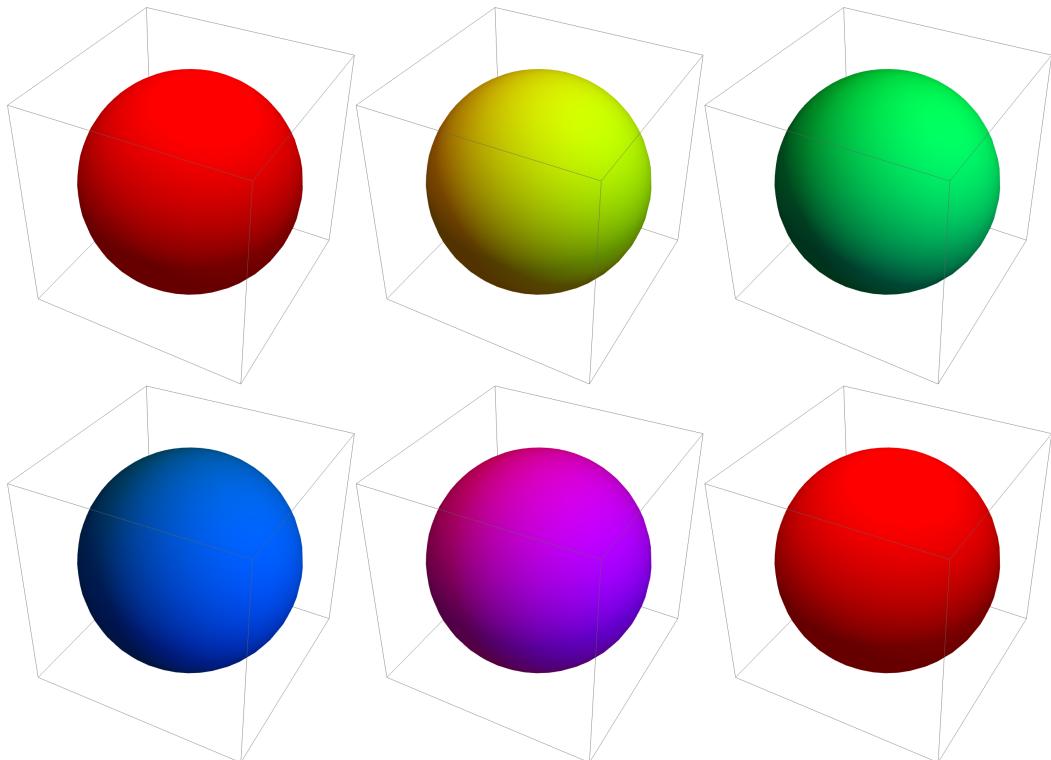
```
In[102]:= (* 10.9 *) ImageCollage[  
  Table[  
    Graphics[Style[Disk[], RandomColor[]]],  
    {i, 1, 9}]]
```

```
Out[102]=
```



```
In[105]:= (* 10.10 *) ImageCollage[
Table[
Graphics3D[Style[Sphere[], Hue[hue]]],
{hue, 0.0, 1.0, 0.2}]
]
```

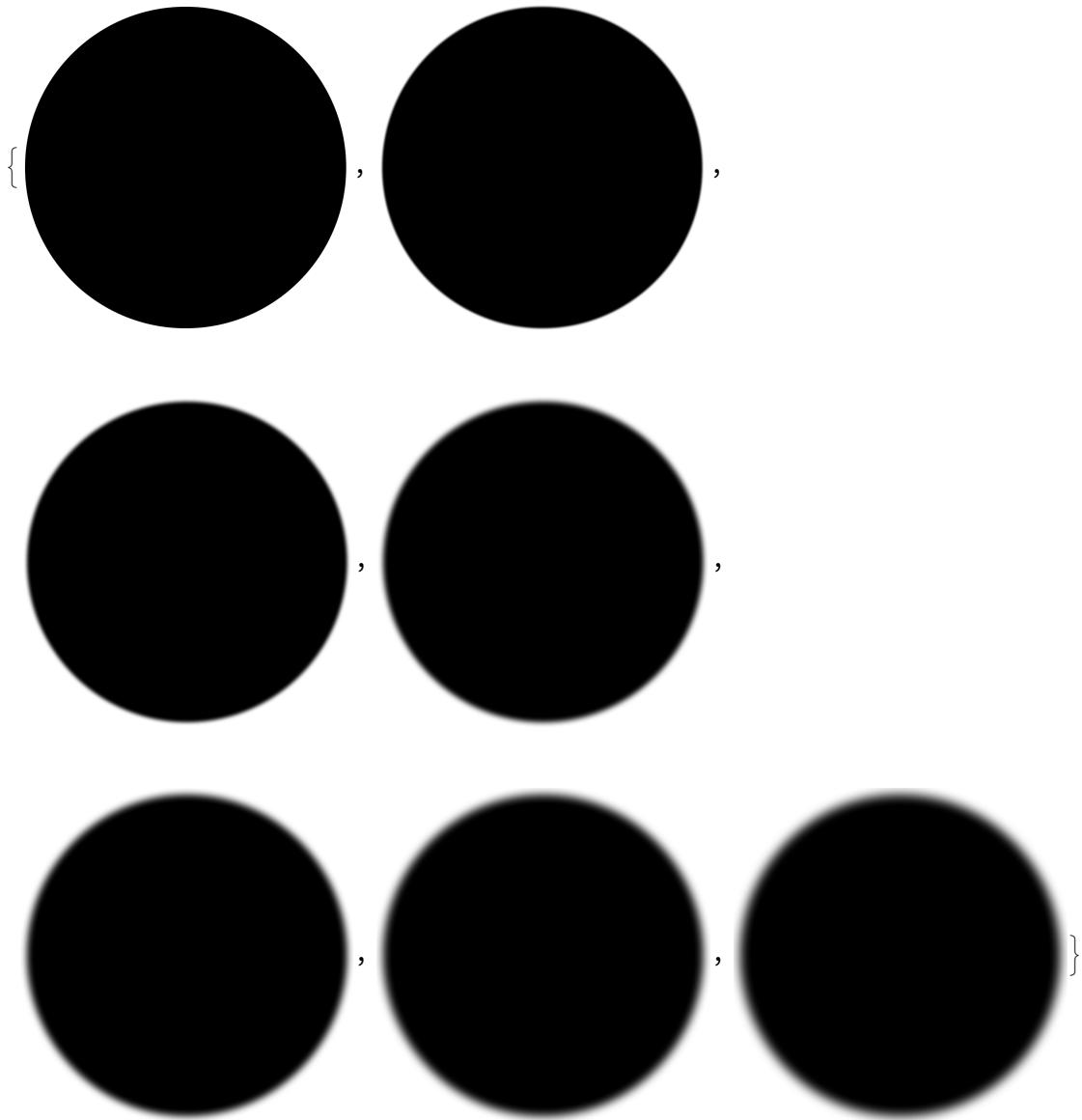
```
Out[105]=
```



In[106]:=

```
(* 10.11 *) Table[  
  Blur[Graphics[Disk[]], blur],  
  {blur, 0, 30, 5}]
```

Out[106]=



```
In[108]:= (* 10.12 *) ImageAdd[anImage, Graphics[Disk[]]]  
Out[108]=
```



```
In[110]:= (* 10.13 *) ImageAdd[anImage, Graphics[Style[RegularPolygon[8], Red]]]  
Out[110]=
```



```
In[111]:= (* 10.14 *) ImageAdd[anImage, ColorNegate[EdgeDetect[anImage]]]
Out[111]=
```



Exercises 11.1-11.15 from EIWL3 Section 11

```
In[121]:= (* 11.1 *) StringJoin[Table["Hello", 2]]
Out[121]= HelloHello

(* 11.2 *) ToUpperCase[StringJoin[Alphabet[]]]
Out[118]= ABCDEFGHIJKLMNOPQRSTUVWXYZ

(* 11.3 *) StringJoin[Reverse[Alphabet[]]]
Out[120]= zyxwvutsrqponmlkjihgfedcba

(* 11.4 *) StringJoin[Reverse[Alphabet[]]]
Out[122]= zyxwvutsrqponmlkjihgfedcba

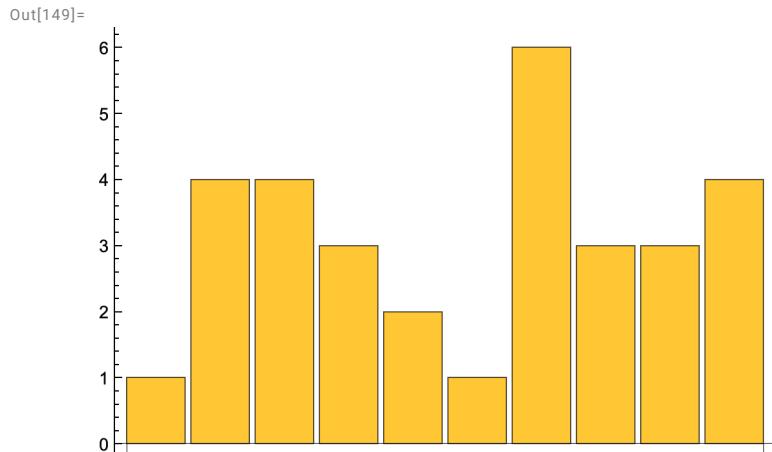
In[124]:= (* 11.5 *) StringTake[StringJoin[Alphabet[]], 6]
Out[124]= abcdef
```

```
(* 11.6 *) (* I had to look up a solution for this,
mostly because I did not understand the question. *)
Column[Table[StringTake["this is about strings", n],
{n, StringLength["this is about strings"]}]]

Out[146]=
t
th
thi
this
this
this i
this is
this is
this is a
this is ab
this is abo
this is abou
this is about
this is about
this is about s
this is about st
this is about str
this is about stri
this is about strin
this is about string
this is about strings
```

(* 11.7*)

```
BarChart[StringLength[TextWords["A long time ago, in a galaxy far, far away"]]]
```



(* 11.8 *) StringLength[WikipediaData["Computer"]]

Out[129]=
60266

```
In[133]:= (* 11.9 *) Length[TextWords[WikipediaData["Computer"]]]
Out[133]= 9271

In[139]:= (* 11.10 *) First[TextSentences[WikipediaData["Computer"]]]
Out[139]= A computer is a machine that can be programmed to automatically
           carry out sequences of arithmetic or logical operations (computation).

In[141]:= (* 11.11 *) StringJoin[StringTake[TextSentences[WikipediaData["Computer"]], 1]]
Out[141]= AMTTACCESEMTTCTPP=ITTDDBTTTT==DTLTTTSITIIDMTAAATTIASIBIAITIITSI=CCAHTFTTAEBNH
          =ITax()2{,THI=DHTTTTAB==CBTDETTITIRTZTT=PTEITDTTHACIINCTLOTIIHBT==TTHTVTE=
          ECWATIHJTIIAATBAIL=TJFCJTHATHTTWITT=TTDTKIHKNHNPNIITGFTTWISTITS=TLTNTTT=C=A=SH=
          TC==ATIET=WTTSC=TSC=TCATRDIRTPWIWSAIT=TES=TTSHALTSG=
          AETTLSIETWOAMTTRACrRIISFIIG=IDOHCIAMA=WTOBITSTBSIT=SMSTSS=SSCICW=T=TTMIAL=
          TITHTFMPWSTCBOTOI=ITTSTTITMWITC=PUTTS=MF=ATHHIT=PALTP=ETHOBSA=CTITTITCITA"=AWA=
          TMH=TQCVSLTTT=ACARPE=AT=====M

(* 11.12 *) Last[SortBy[WordList[], StringLength]]
(* I learned while grading that using Max is better than what I did *)
Out[150]= electroencephalographic

(* 11.13 *) (* I had to look up a solution for this,
but now that I see it, I should have had it on my own. *)
Count[StringTake[WordList[], 1], "q"]
Out[156]= 194

In[158]:= (* 11.14 *) ListLinePlot[StringLength[Take[WordList[], 1000]]]
Out[158]=
```

```
(* 11.15 *) WordCloud[Characters[StringJoin[WordList[]]]]
```

```
Out[160]=
```

