

Brian — PS 3 — 2025-01-24 — Solution

EIWL3 Sections 9 and 10, and First Half of Section 11

Exercises from *EIWL3 Section 9*

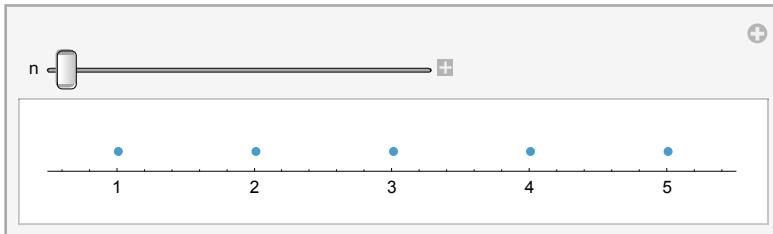
```
In[30]:= (* 9.1 *) Manipulate[Range[n], {n, 0, 100, 1}]
```

```
Out[30]=
```



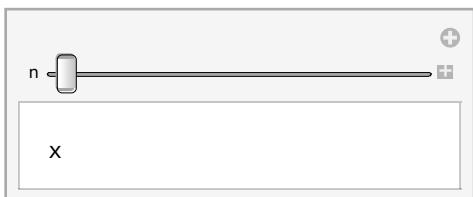
```
In[31]:= (* 9.2 *) Manipulate[NumberLinePlot[Range[n]], {n, 5, 50, 1}]
```

```
Out[31]=
```

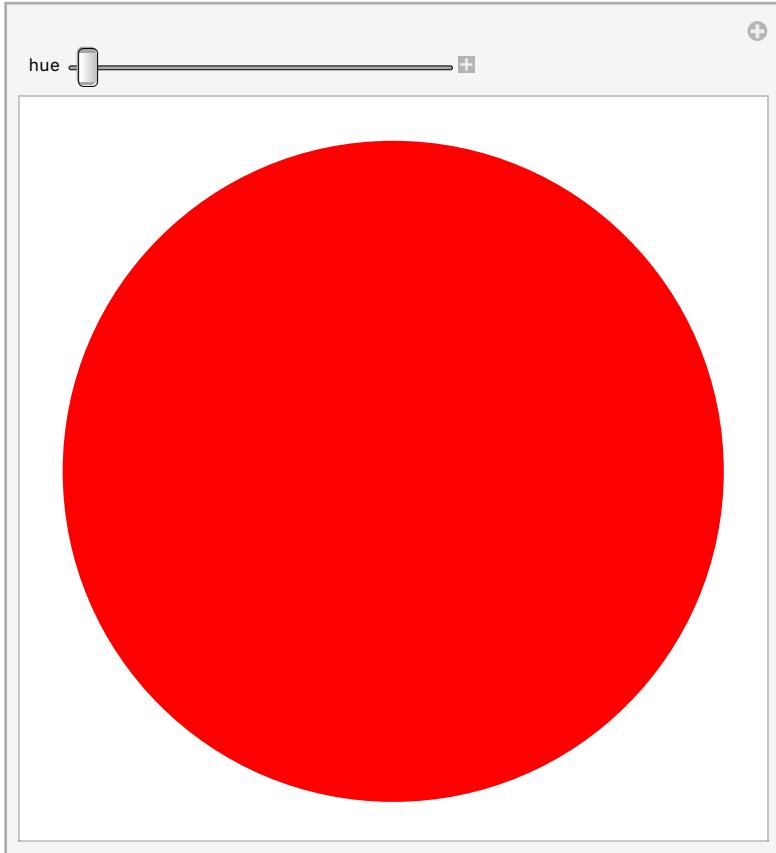


```
In[32]:= (* 9.3 *) Manipulate[Column[Table[x, n]], {n, 1, 10, 1}]
```

```
Out[32]=
```

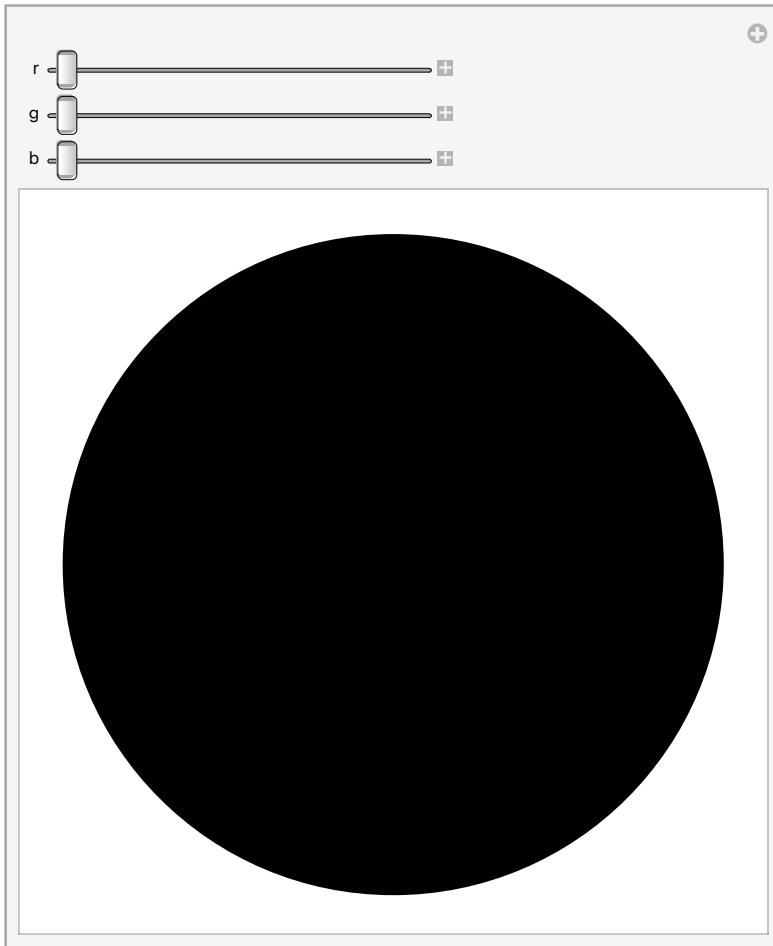


```
In[33]:= (* 9.4 *) Manipulate[Graphics[Style[Disk[], Hue[hue]], {hue, 0, 1}]  
Out[33]=
```



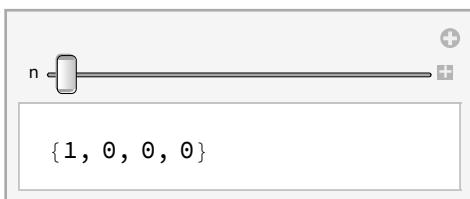
```
In[34]:= (* 9.5 *) Manipulate[
Graphics[Style[Disk[], RGBColor[r, g, b]]], {r, 0, 1}, {g, 0, 1}, {b, 0, 1}]
```

Out[34]=



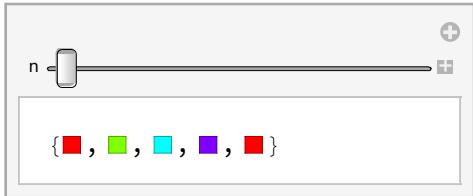
```
In[35]:= (* 9.6 *) Manipulate[IntegerDigits[n], {n, 1000, 9999, 1}]
```

Out[35]=



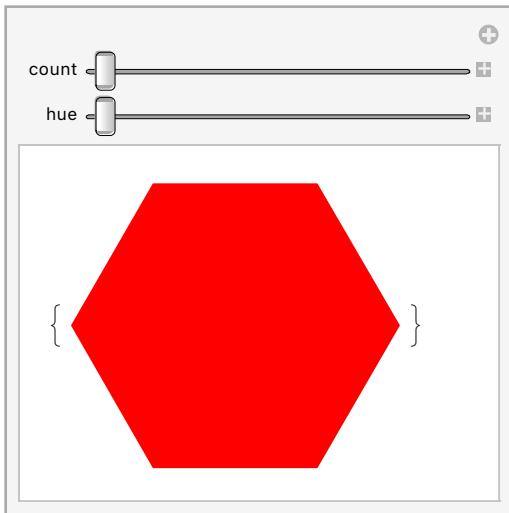
```
In[36]:= (* 9.7 *) Manipulate[Table[Hue[i/(n - 1)], {i, 0, n - 1}], {n, 5, 50}]  
(* Perhaps I got a bit carried away with my interpretation of equally-spaced :*)
```

Out[36]=



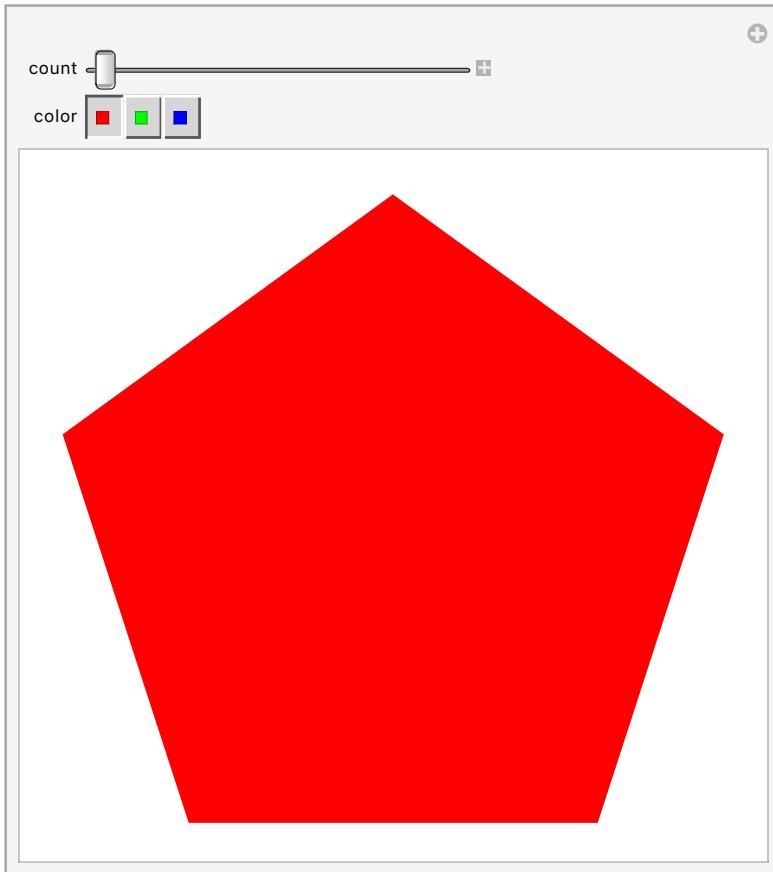
```
In[37]:= (* 9.8 *) Manipulate[Table[Graphics[Style[RegularPolygon[6], Hue[hue]]], count],  
{count, 1, 10, 1}, {hue, 0, 1}]
```

Out[37]=

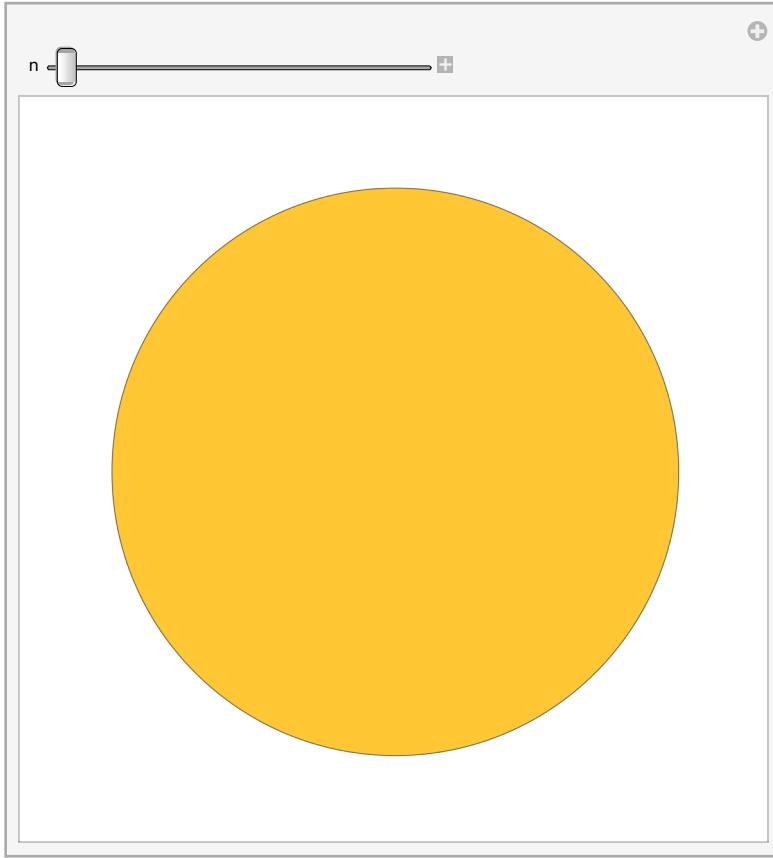


```
In[38]:= (* 9.9 *) Manipulate[Graphics[Style[RegularPolygon[count], color]], {count, 5, 20, 1}, {color, {Red, Green, Blue}}]
```

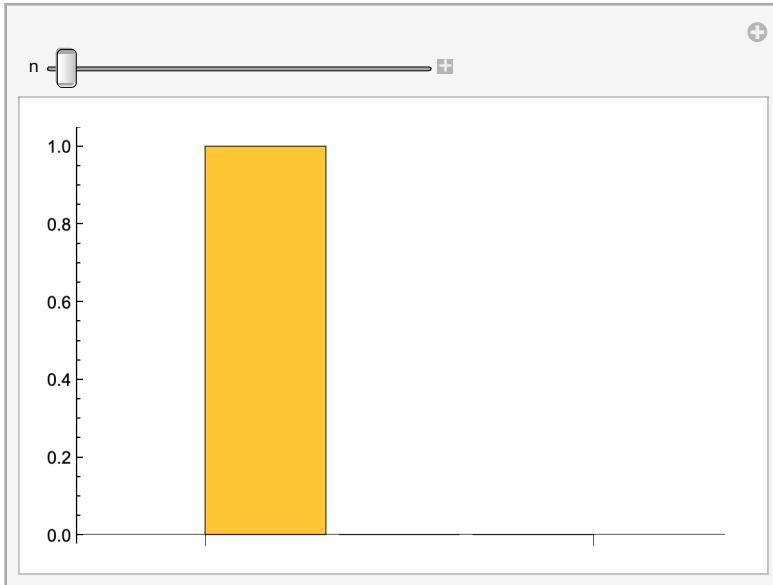
Out[38]=



```
In[39]:= (* 9.10 *) Manipulate[PieChart[Table[1, n]], {n, 1, 10}]  
Out[39]=
```



```
In[40]:= (* 9.11 *) Manipulate[BarChart[IntegerDigits[n]], {n, 100, 999, 1}]  
Out[40]=
```



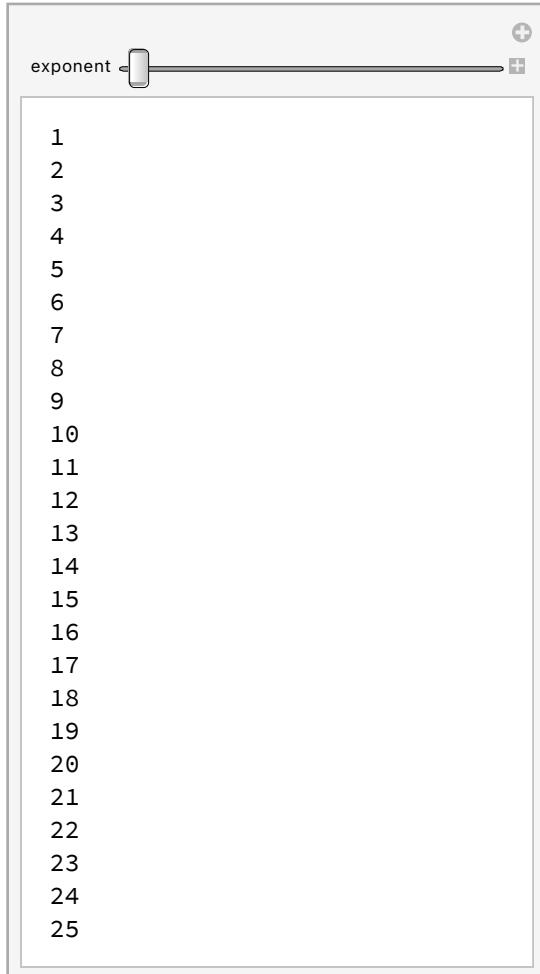
```
In[41]:= (* 9.12 *) Manipulate[Table[RandomColor[], n], {n, 1, 50}]
```

```
Out[41]=
```



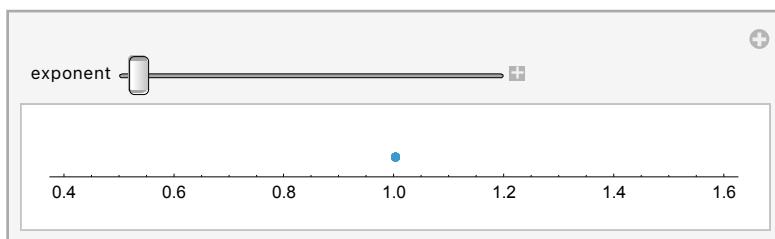
```
In[42]:= (* 9.13 *) Manipulate[Column[Table[base^exponent, {base, 1, 25}]], {exponent, 1, 10, 1}]
```

```
Out[42]=
```



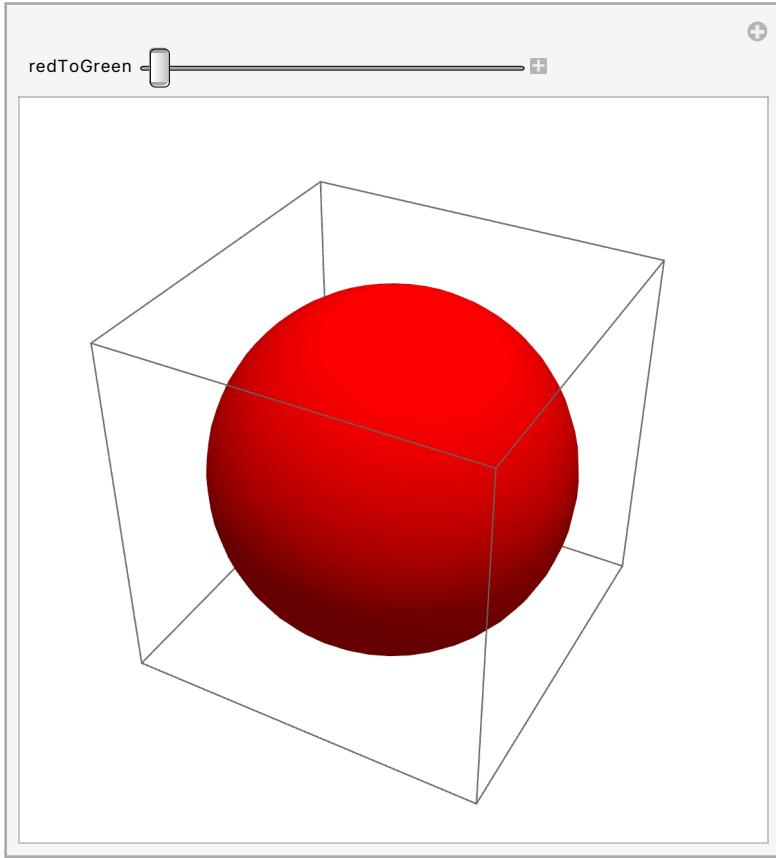
```
In[43]:= (* 9.14 *) Manipulate[NumberLinePlot[Range[10]^exponent], {exponent, 0, 5, 1}]
```

```
Out[43]=
```



```
In[44]:= (* 9.15 *) Manipulate[Graphics3D[
  Style[Sphere[], RGBColor[1 - redToGreen, redToGreen, 0]]], {redToGreen, 0, 1}]
```

Out[44]=



Exercises from EIWL3 Section 10

```
In[45]:= anImage = CurrentImage[];
(* An image I will be re-using for lots of the exercises *)
```

```
In[46]:= (* 10.1 *) ColorNegate[anImage]
```

```
Out[46]=
```

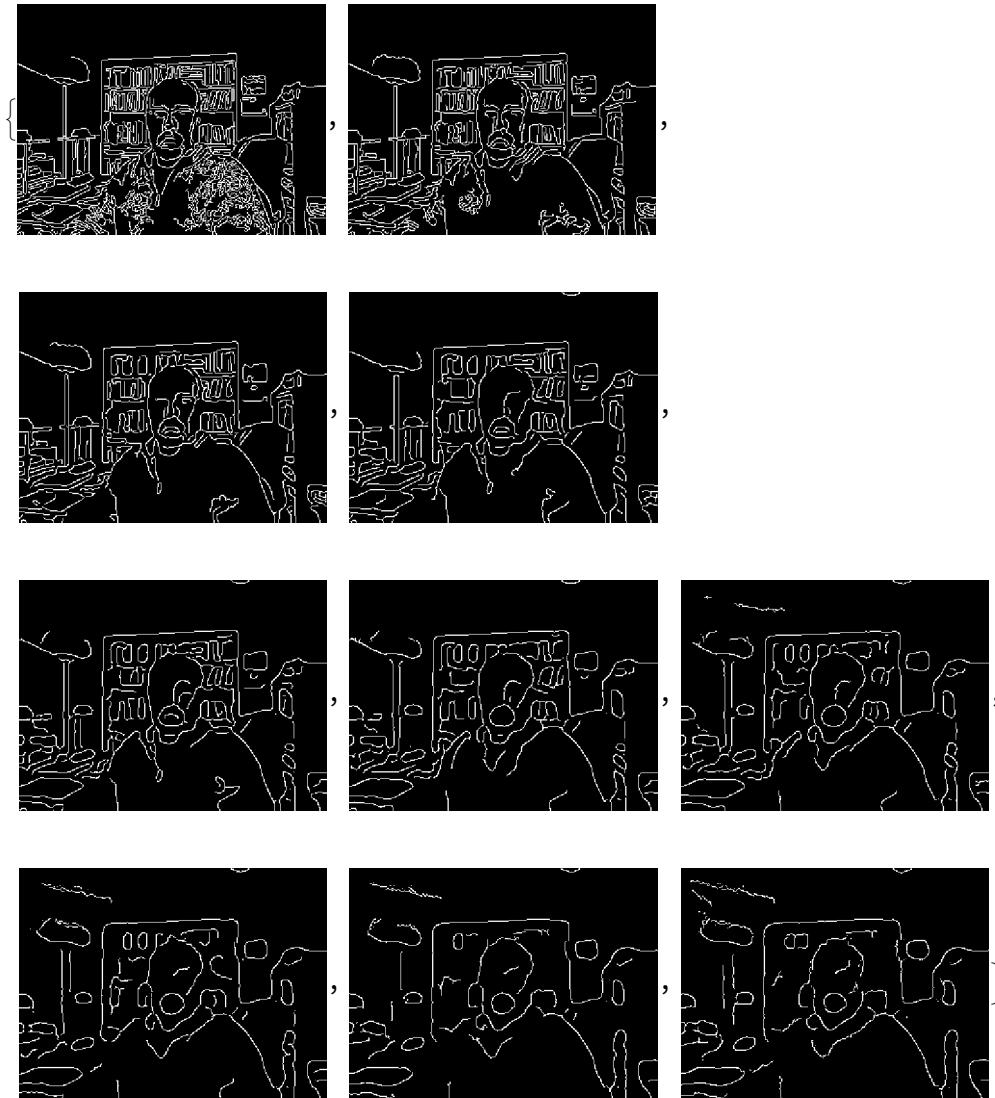


```
In[47]:= (* 10.2 *) Manipulate[Blur[anImage, blur], {blur, 0, 20}]
```

```
Out[47]=
```

A Manipulate interface showing a slider for "blur" from 0 to 20. The current value is set to 0. Below the slider is a blurred version of the same portrait of a man with glasses and a beard, wearing a blue sweater. The background shows a bookshelf and office equipment.

```
In[48]:= (* 10.3 *) Table[EdgeDetect[Blur[anImage, blur]], {blur, 1, 10}]  
Out[48]=
```



In[49]:= (* 10.4 *)

```
ImageCollage[{anImage, Blur[anImage], EdgeDetect[anImage], Binarize[anImage]}]
```

Out[49]=



In[50]:= (* 10.5 *) anImage + Binarize[anImage]

Out[50]=

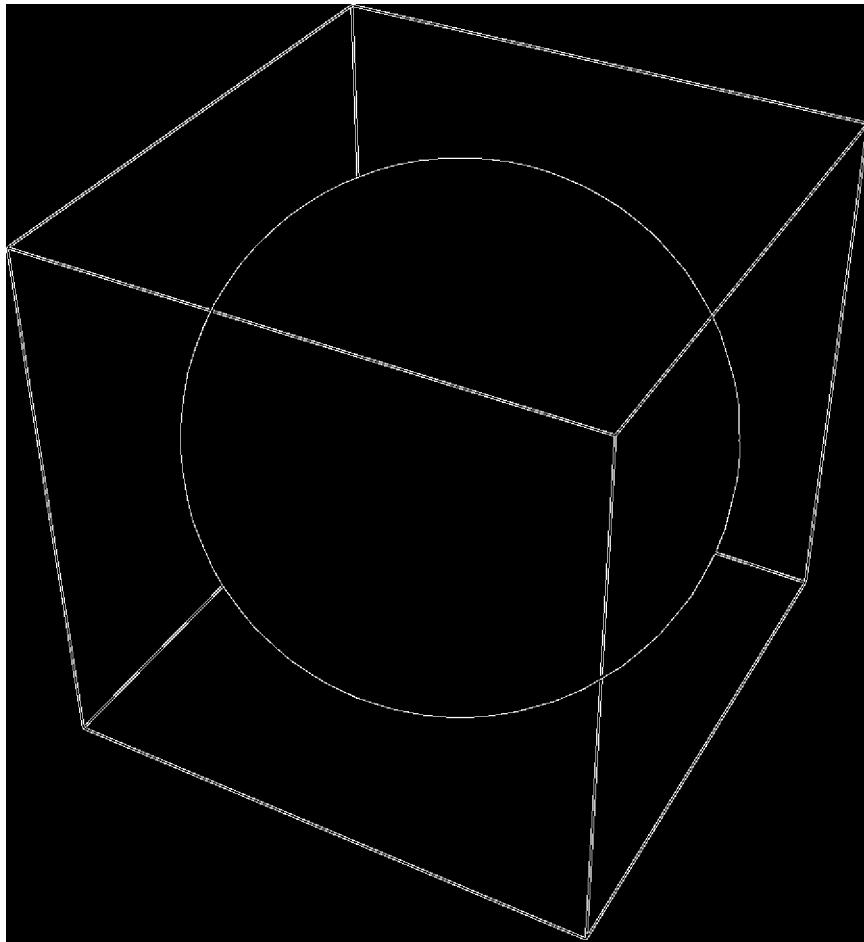


```
In[51]:= (* 10.6 *) Manipulate[EdgeDetect[Blur[anImage, blur]], {blur, 0, 20}]  
Out[51]=
```

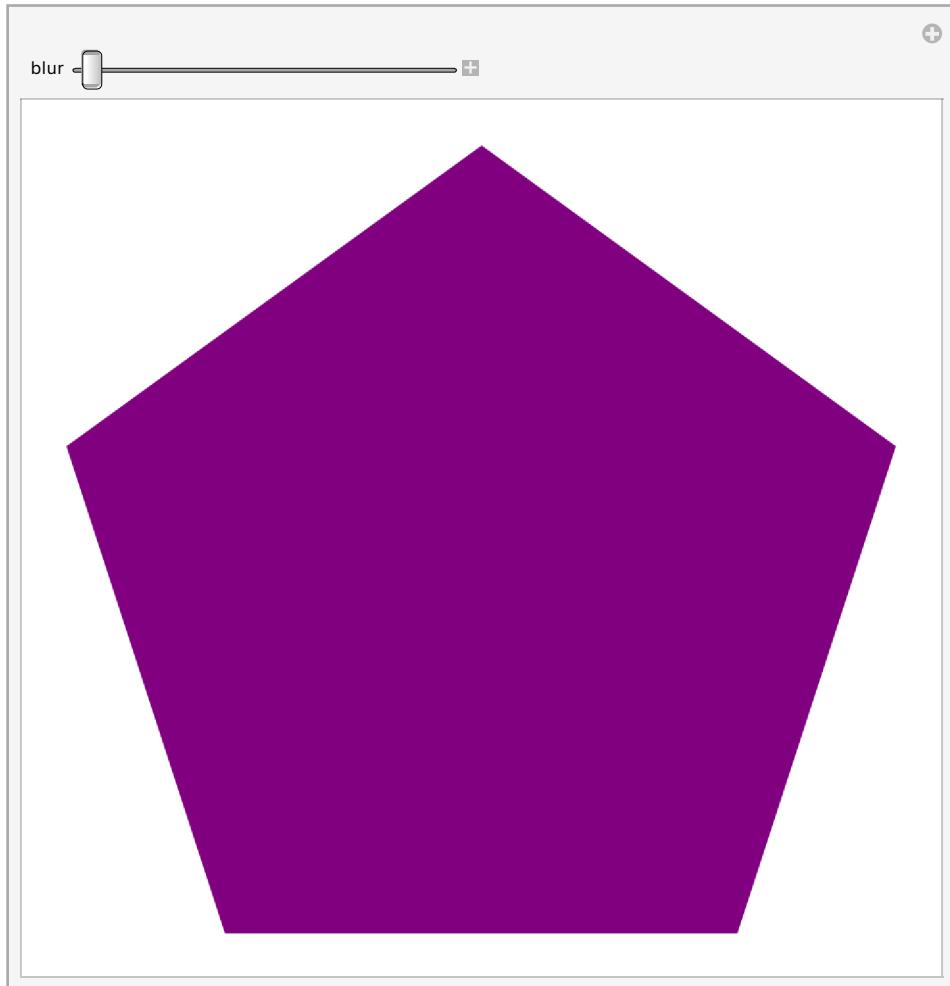


```
In[52]:= (* 10.7 *) EdgeDetect[Graphics3D[Sphere[]]]
```

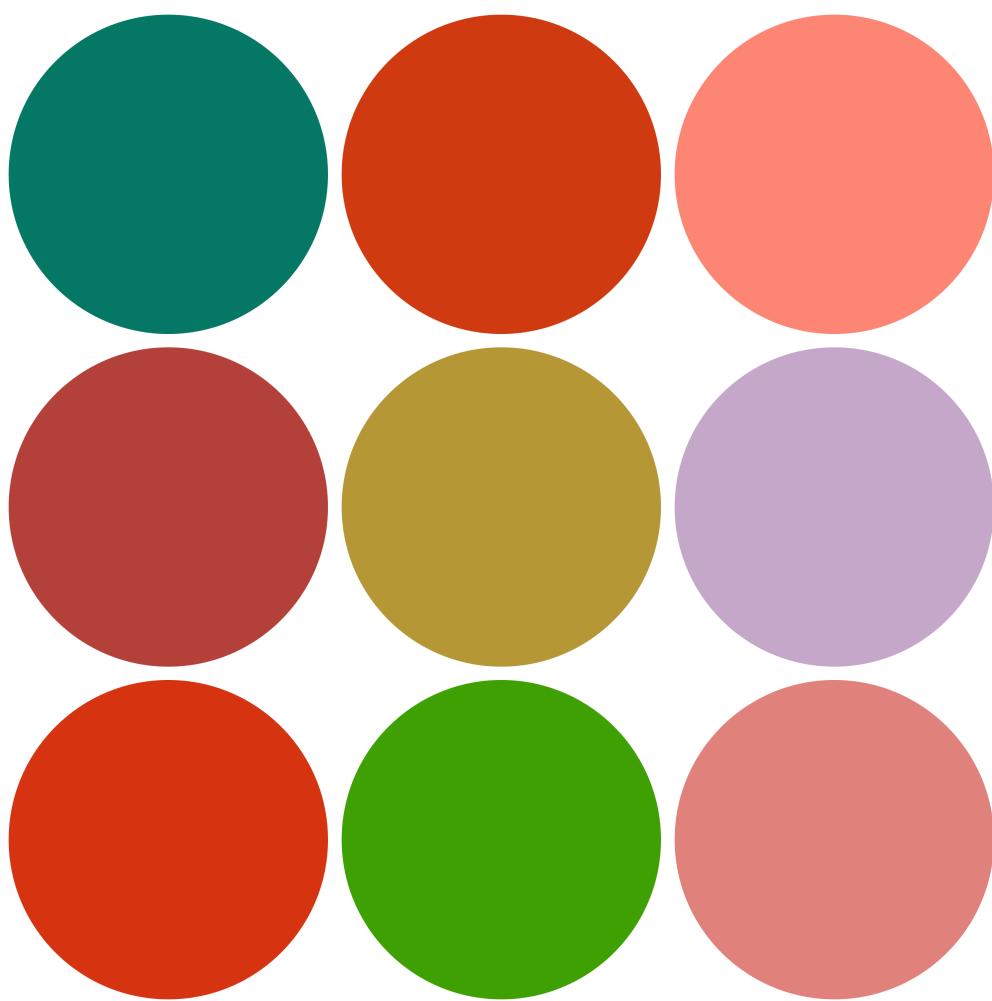
```
Out[52]=
```



```
In[53]:= (* 10.8 *)
Manipulate[Blur[Graphics[Style[RegularPolygon[5], Purple]], blur], {blur, 0, 20}]
Out[53]=
```

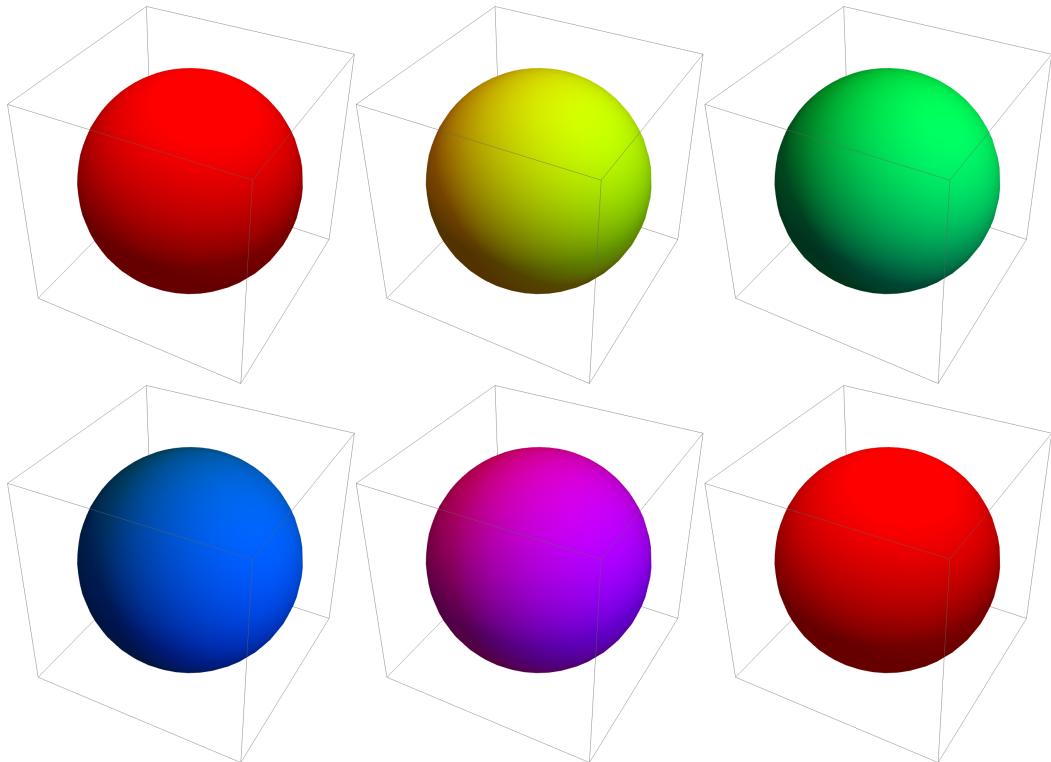


```
In[54]:= (* 10.9 *) ImageCollage[  
Table[  
Graphics[Style[Disk[], RandomColor[]]],  
{i, 1, 9}]  
]  
Out[54]=
```



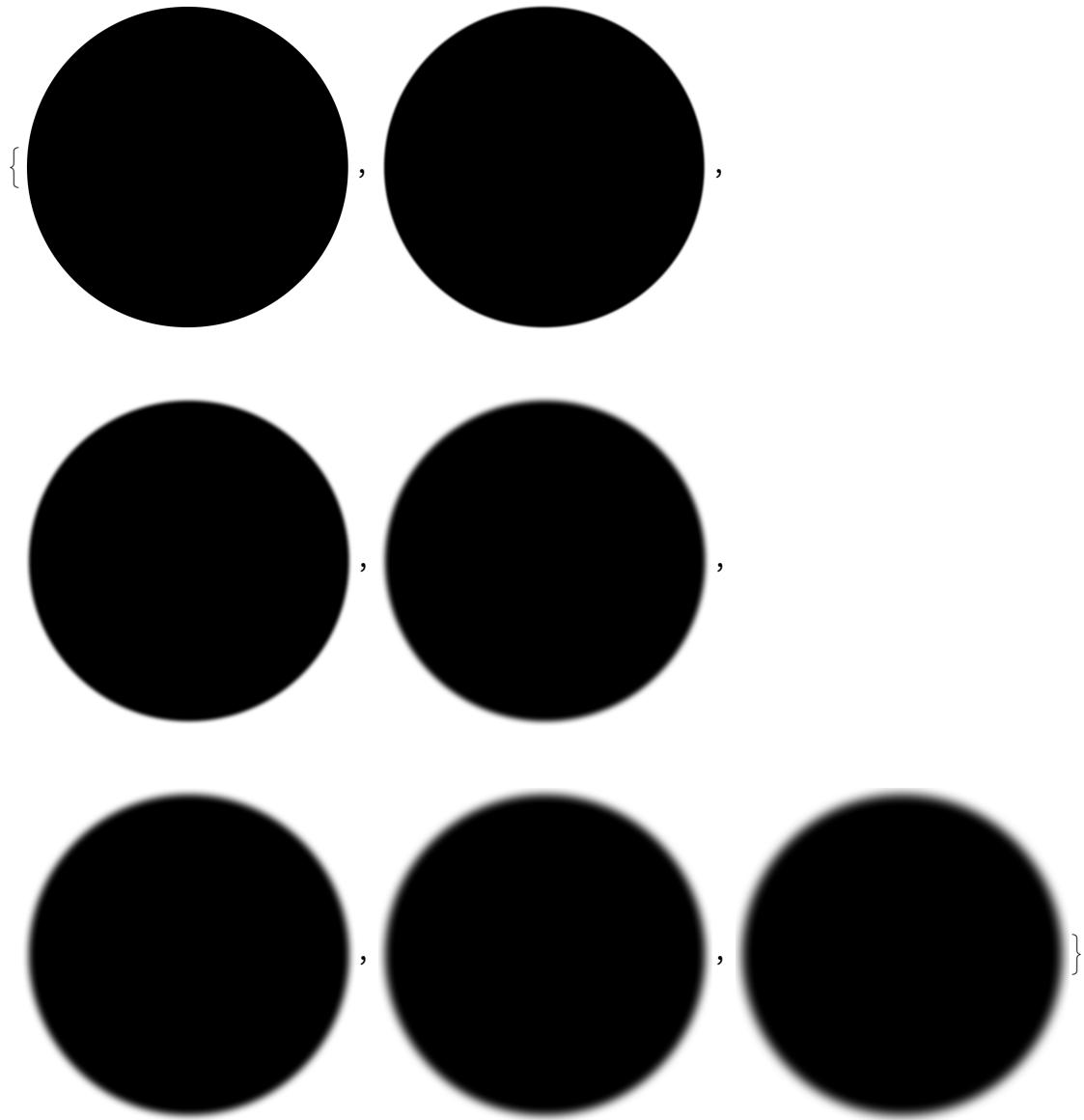
```
In[55]:= (* 10.10 *) ImageCollage[
Table[
Graphics3D[Style[Sphere[], Hue[hue]]],
{hue, 0.0, 1.0, 0.2}]
]
```

Out[55]=



```
In[56]:= (* 10.11 *) Table[
  Blur[Graphics[Disk[]], blur],
  {blur, 0, 30, 5}]
```

Out[56]=



```
In[57]:= (* 10.12 *) ImageAdd[anImage, Graphics[Disk[]]]  
Out[57]=
```



```
In[58]:= (* 10.13 *) ImageAdd[anImage, Graphics[Style[RegularPolygon[8], Red]]]  
Out[58]=
```



```
In[59]:= (* 10.14 *) ImageAdd[anImage, ColorNegate[EdgeDetect[anImage]]]  
Out[59]=
```



Exercises 11.1-11.15 from EWL3 Section 11

```
In[60]:= (* 11.1 *) StringJoin[Table["Hello", 2]]  
Out[60]= HelloHello  
  
In[61]:= (* 11.2 *) ToUpperCase[StringJoin[Alphabet[]]]  
Out[61]= ABCDEFGHIJKLMNOPQRSTUVWXYZ  
  
In[62]:= (* 11.3 *) StringJoin[Reverse[Alphabet[]]]  
Out[62]= zyxwvutsrqponmlkjihgfedcba  
  
In[63]:= (* 11.4 *) StringJoin[Reverse[Alphabet[]]]  
Out[63]= zyxwvutsrqponmlkjihgfedcba  
  
In[64]:= (* 11.5 *) StringTake[StringJoin[Alphabet[]], 6]  
Out[64]= abcdef  
  
In[65]:= (* 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[65]= 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
```

```
In[66]:= (* 11.7 *)
BarChart[StringLength[TextWords["A long time ago, in a galaxy far, far away"]]]

Out[66]=
```

Word Length	Frequency
1	1
2	4
3	4
4	3
5	1
6	6
7	3
8	3
9	4


```
In[67]:= (* 11.8 *) StringLength[WikipediaData["Computer"]]
Out[67]= 60266
```



```
In[68]:= (* 11.9 *) Length[TextWords[WikipediaData["Computer"]]]
Out[68]= 9271
```



```
In[69]:= (* 11.10 *) First[TextSentences[WikipediaData["Computer"]]]
Out[69]= I guess I did the wrong Wikipedia entry.
A computer is a machine that can be programmed to automatically
carry out sequences of arithmetic or logical operations (computation).
```



```
In[70]:= (* 11.11 *) StringJoin[StringTake[TextSentences[WikipediaData["Computer"]], 1]]
Out[70]= AMTTACCESEMTTCTPP=ITTDDBTTTT==DTLTTTSITIIDMTAAATTIASIBIAITITIITSI=CCAHTFTTAEBNH
=ITax()2{,THI=DHTTTTAB==CBTDETTITIRTZTT=PTEITDTTHACIINCLOTIIIHBT==TTHTVTE=
ECWATIHJTIIAATBAIL=TJFCJTHATHTTWITT=TTDTKIHKNHPNIMTGFTTWISTITS=TTLTTTT=C=A=SH=
TC==ATIET=WTTSC=TSC=TCATRDIRTPIWJSAIT=TES=TTSHTALTSG=
AETTLSIETWOAMTTRACrRIISFIIG=IDOHCIAAMA=WTOBITSTBSIT=SMSTSS=SSCICW=T=TTMIAL=
TITHTFMPWSTCBOTOI=ITTSTTITMWITC=PUTTS=MF=ATHHIT=PALTP=ETHOBSA=CTITTTICITA"=AWA=
TMH=TQCVSLTTT=ACARPE=AT=====M
```



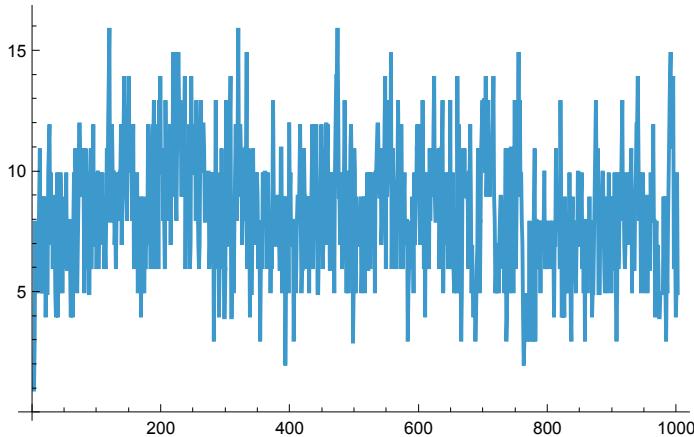
```
In[71]:= (* 11.12 *) Last[SortBy[WordList[], StringLength]]
(* I learned while grading that using Max is better than what I did *)
Out[71]= electroencephalographic
```

```
In[72]:= (* 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[72]=  
194
```

```
In[73]:= (* 11.14 *) ListLinePlot[StringLength[Take[WordList[], 1000]]]
```

```
Out[73]=
```



```
In[74]:= (* 11.15 *) WordCloud[Characters[StringJoin[WordList[]]]]
```

```
Out[74]=
```

