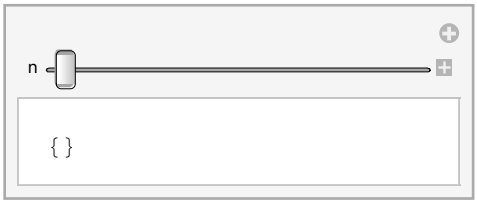
Brian — PS 3 — 2025-01-24 — Solution

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

Exercises from *EIWL3* Section 9

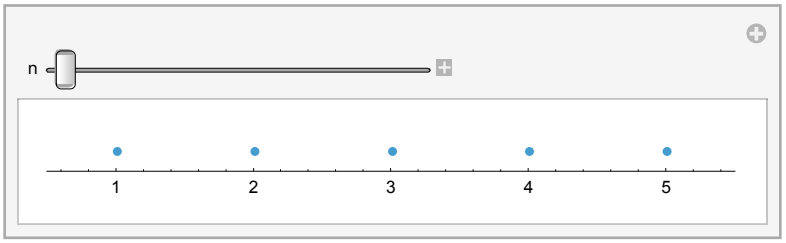
In[30]:=
```
(* 9.1 *) Manipulate[Range[n], {n, 0, 100, 1}]
```

Out[30]=



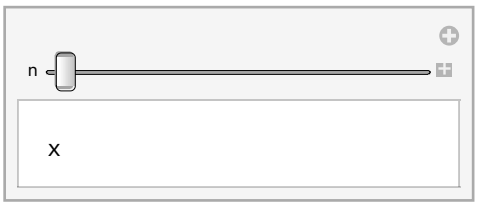
In[31]:=
```
(* 9.2 *) Manipulate[NumberLinePlot[Range[n]], {n, 5, 50, 1}]
```

Out[31]=



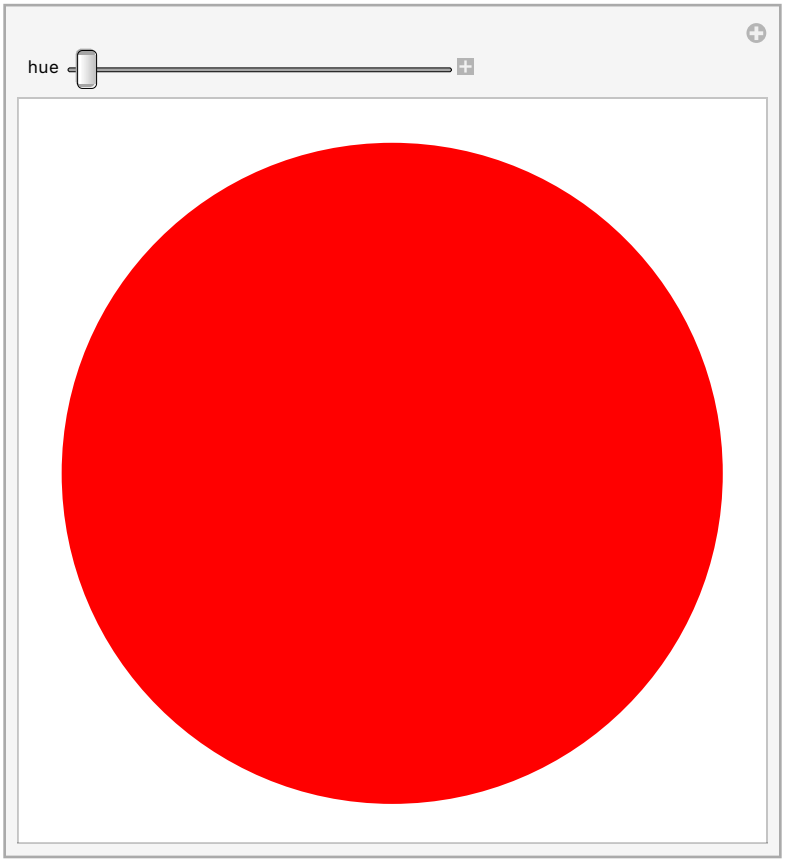
In[32]:=
```
(* 9.3 *) Manipulate[Column[Table[x, n]], {n, 1, 10, 1}]
```

Out[32]=



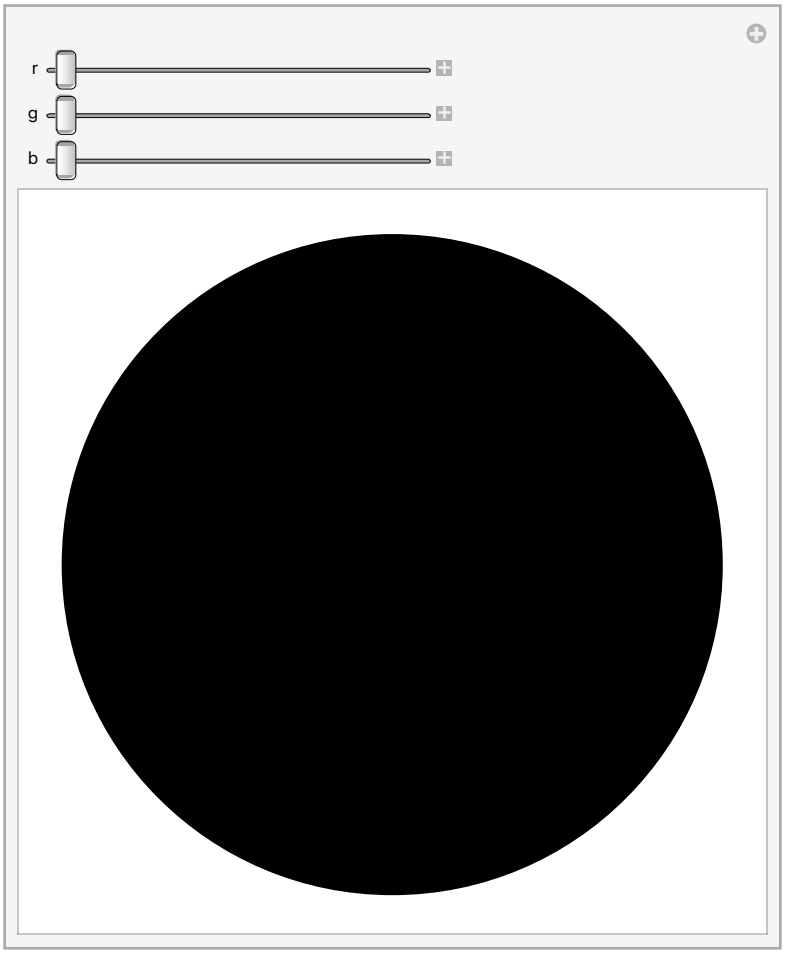
In[33]:=
```
(* 9.4 *) Manipulate[Graphics[Style[Disk[], Hue[hue]]], {hue, 0, 1}]
```

Out[33]=



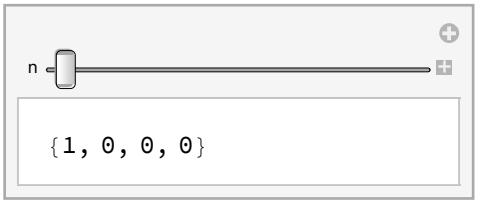
In[34]:=
```
(* 9.5 *) Manipulate[
 Graphics[Style[Disk[], RGBColor[r, g, b]]], {r, 0, 1}, {g, 0, 1}, {b, 0, 1}]
```

Out[34]=



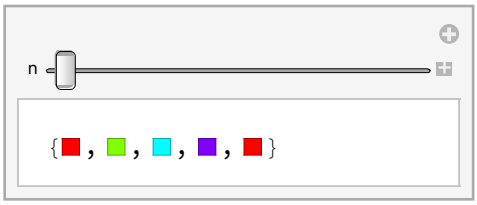
In[35]:=
```
(* 9.6 *) Manipulate[IntegerDigits[n], {n, 1000, 9999, 1}]
```

Out[35]=



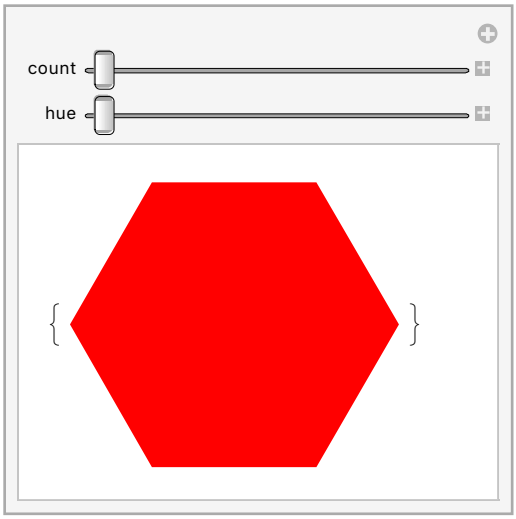
In[36]:=
```
(* 9.7 *) Manipulate[Table[Hue[i/(n - 1)], {i, 0, n - 1}], {n, 5, 50}]
(* Perhaps I got a bit carried away with my interpretation of equally-spaced :) *)
```

Out[36]=



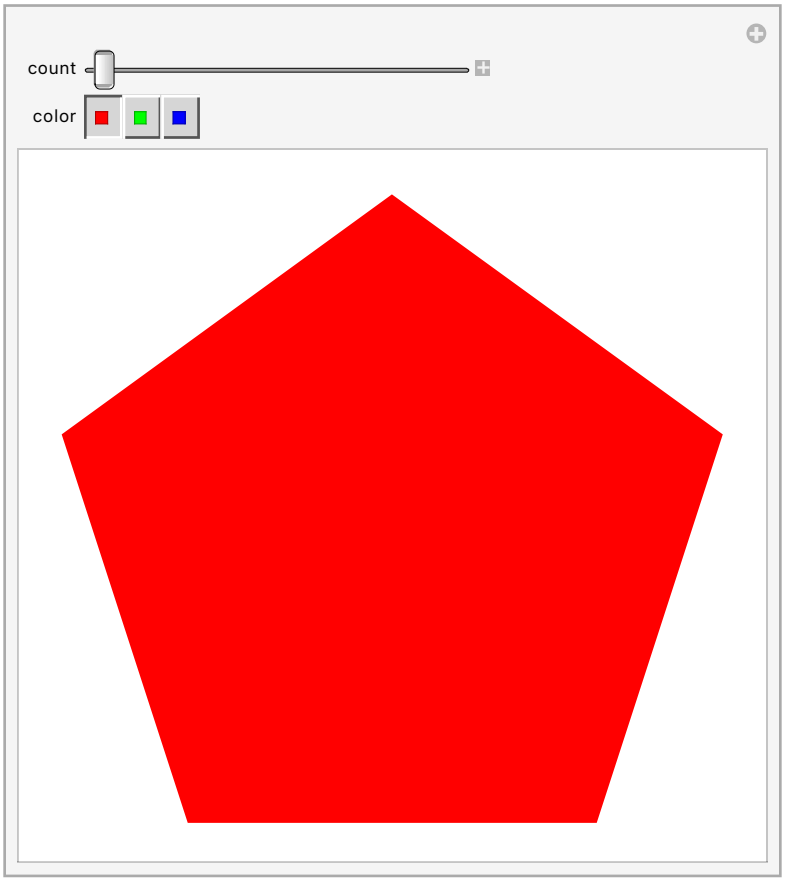
In[37]:=
```
(* 9.8 *) Manipulate[Table[Graphics[Style[RegularPolygon[6], Hue[hue]]], count],
 {count, 1, 10, 1}, {hue, 0, 1}]
```

Out[37]=



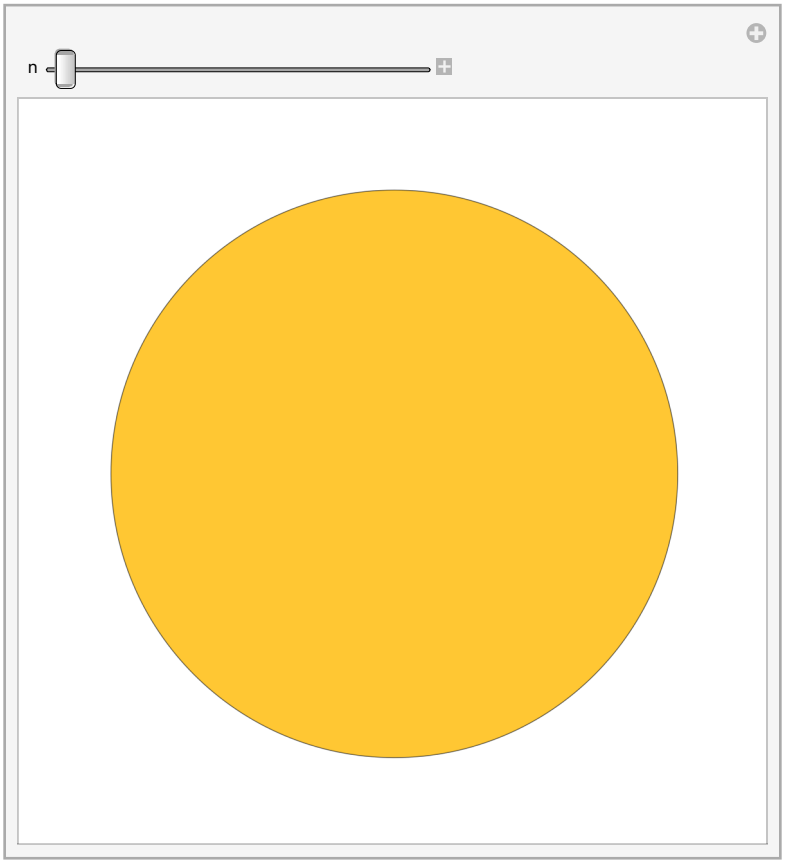
In[38]:=
```
(* 9.9 *) Manipulate[Graphics[Style[RegularPolygon[count], color]],
 {count, 5, 20, 1}, {color, {Red, Green, Blue}}]
```

Out[38]=



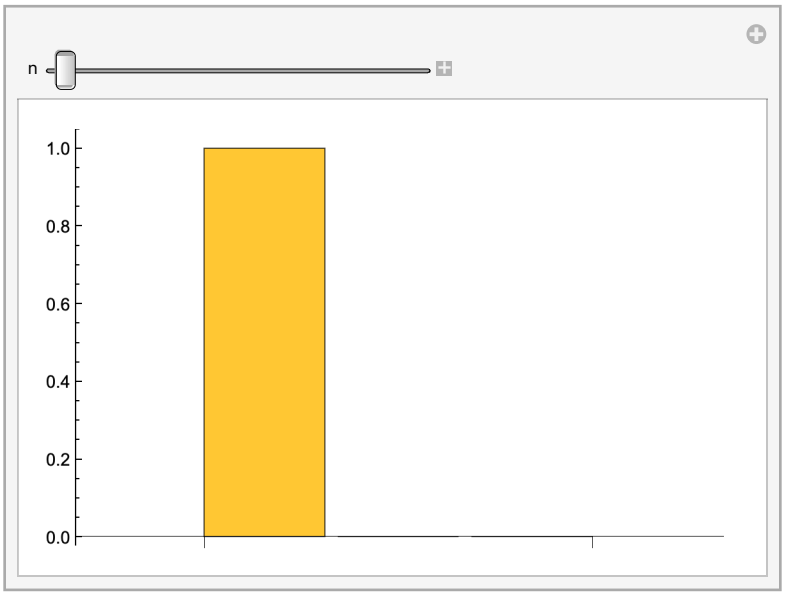
In[39]:=
```
(* 9.10 *) Manipulate[PieChart[Table[1, n]], {n, 1, 10}]
```

Out[39]=



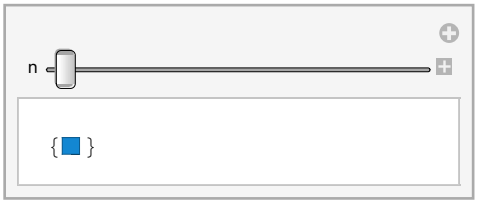
In[40]:=
```
(* 9.11 *) Manipulate[BarChart[IntegerDigits[n]], {n, 100, 999, 1}]
```

Out[40]=



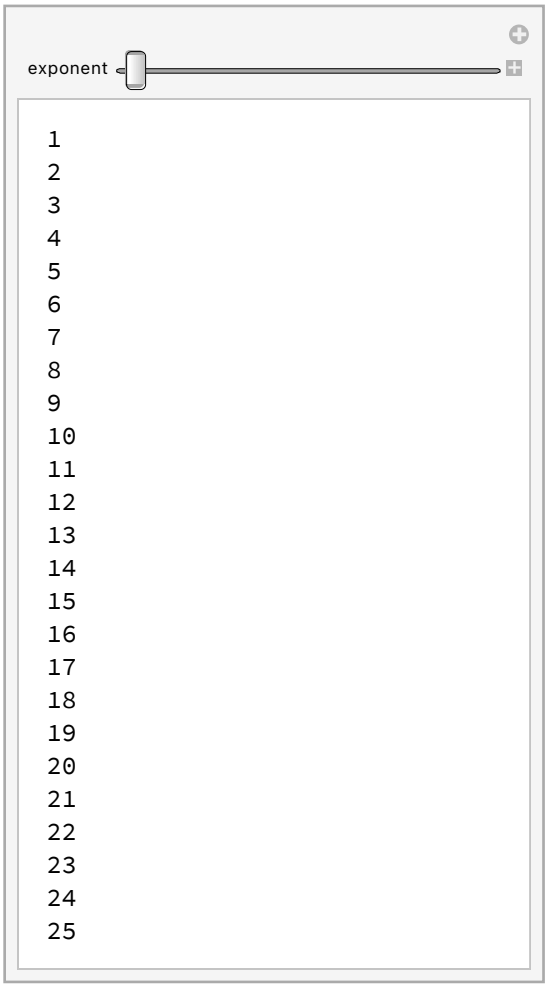
In[41]:=
```
(* 9.12 *) Manipulate[Table[RandomColor[], n], {n, 1, 50}]
```

Out[41]=



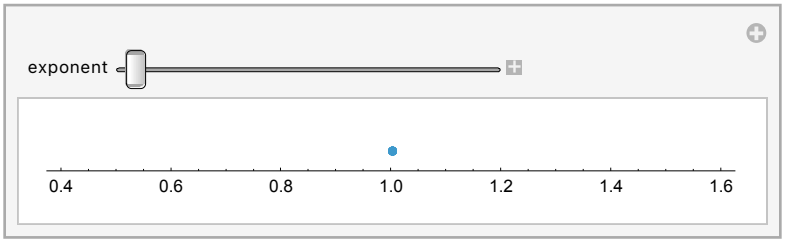
In[42]:=
```
(* 9.13 *) Manipulate[Column[Table[base^exponent, {base, 1, 25}]], {exponent, 1, 10, 1}]
```

Out[42]=



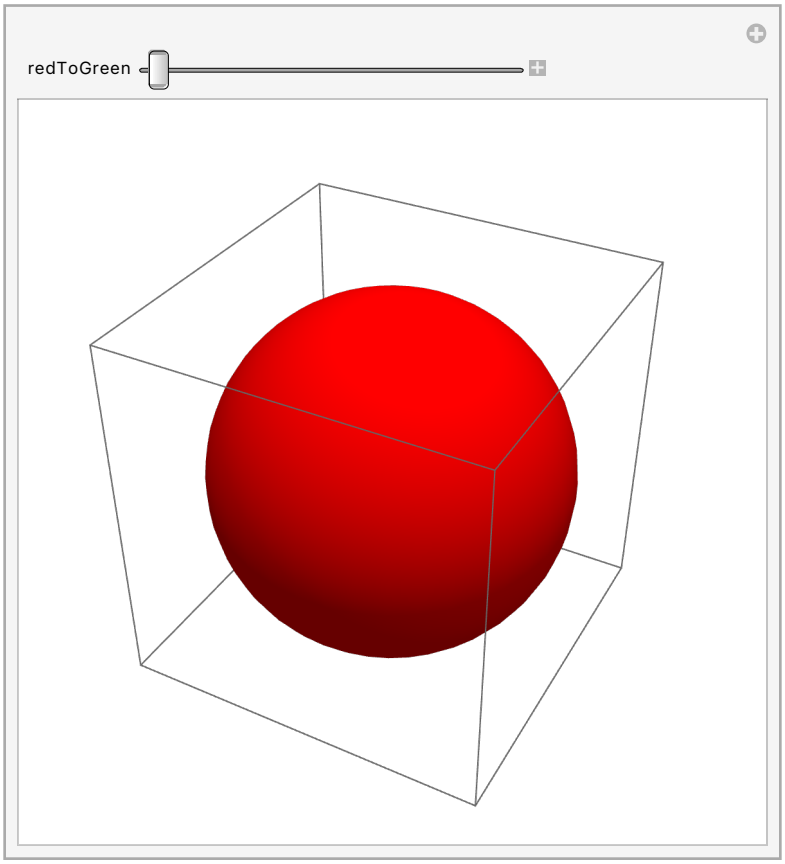
In[43]:=
```
(* 9.14 *) Manipulate[NumberLinePlot[Range[10]^exponent], {exponent, 0, 5, 1}]
```

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

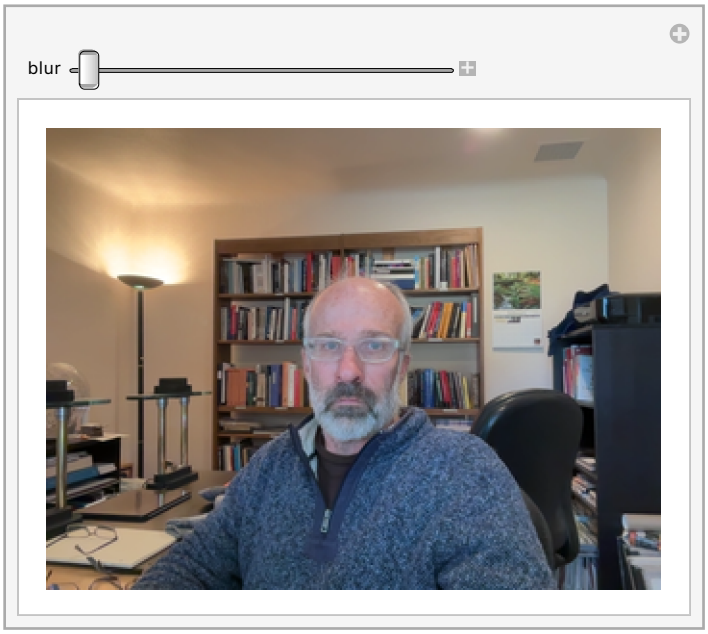
In[45]:=
```
anImage = CurrentImage[];
(* An image I will be re-using for lots of the exercises *)
```

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

Out[46]=

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

Out[47]=



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]
```

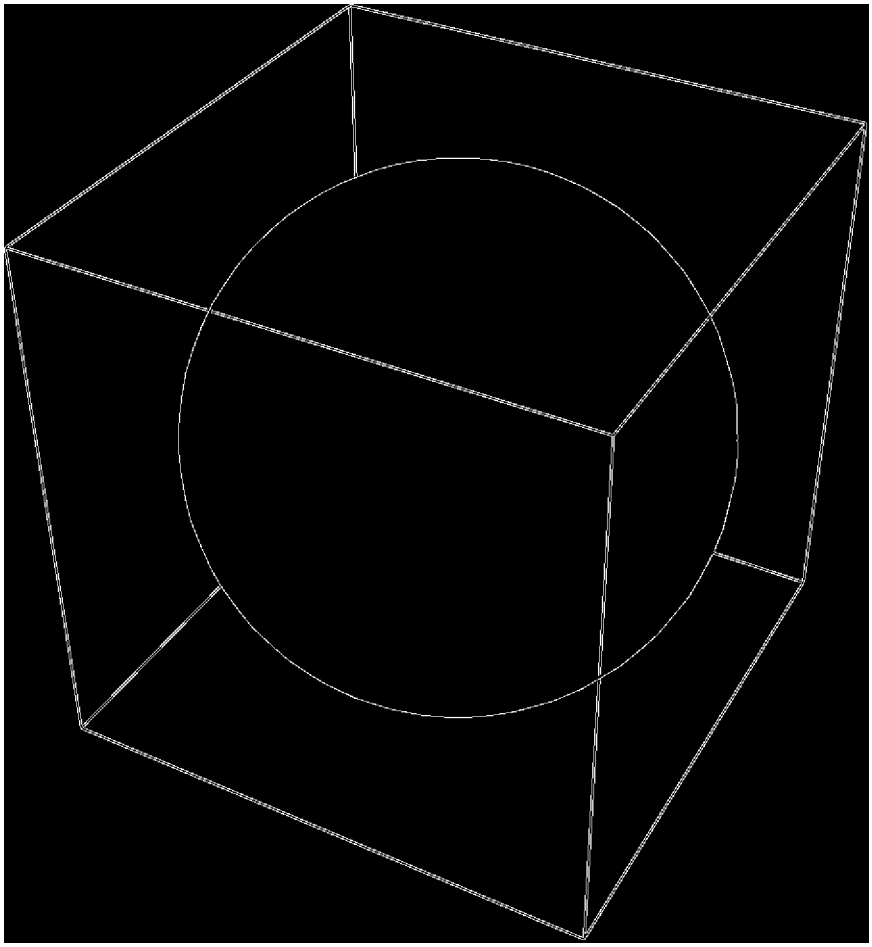
Out[50]=

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

Out[51]=

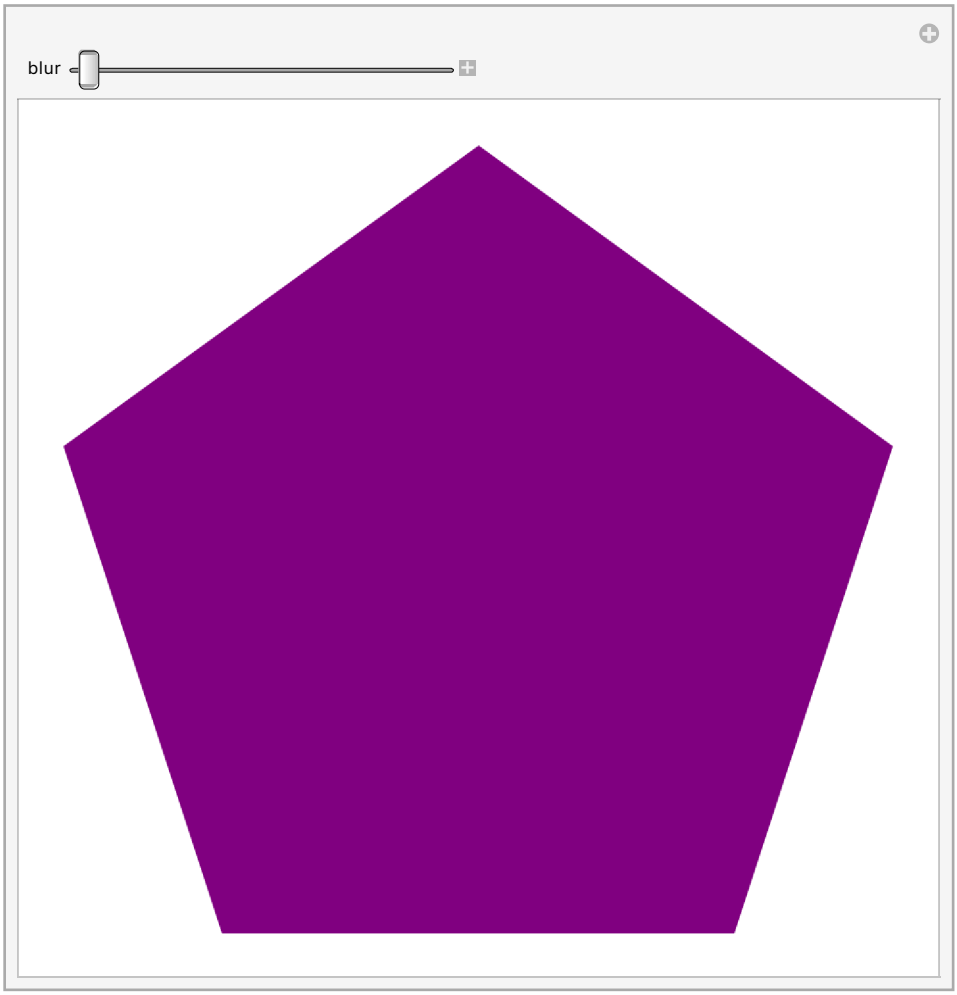
In[52]:= `(* 10.7 *) EdgeDetect[Graphics3D[Sphere[]]]`

Out[52]=



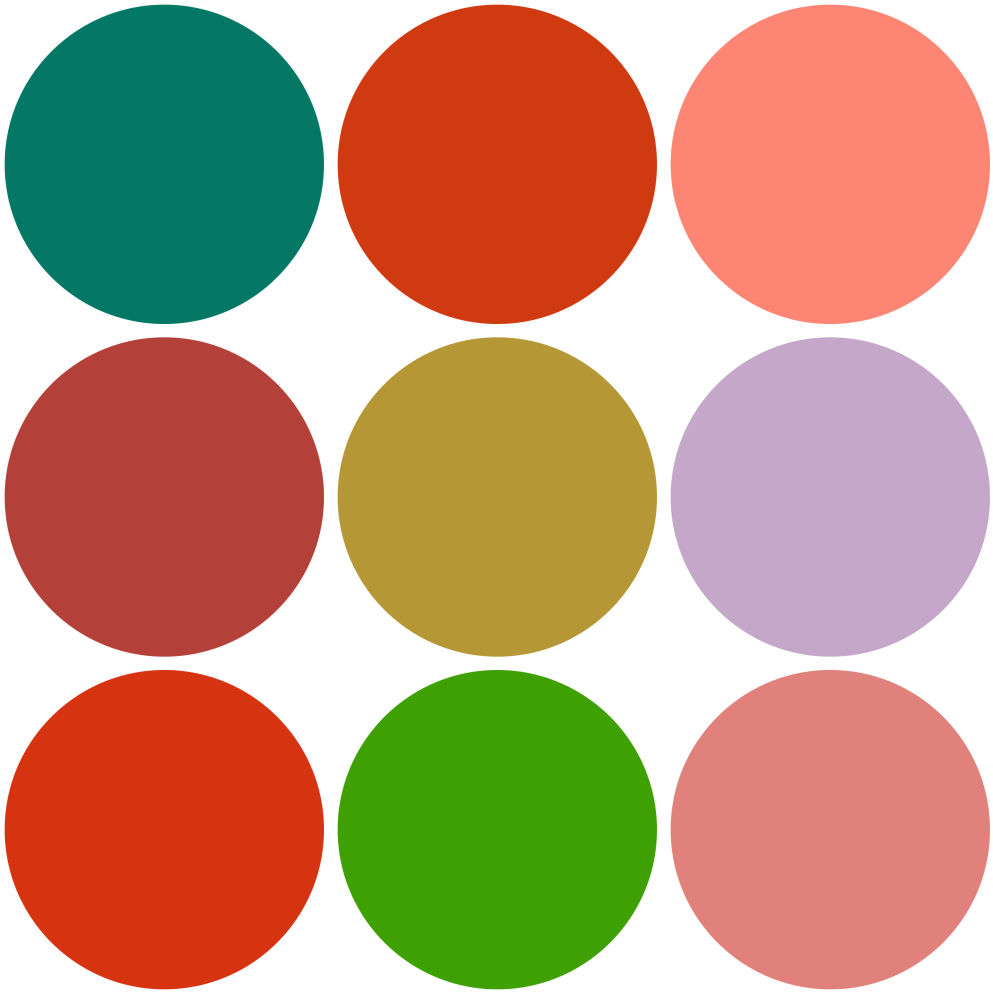
In[53]:=
```
(* 10.8 *)
Manipulate[Blur[Graphics[Style[RegularPolygon[5], Purple]], blur], {blur, 0, 20}]
```

Out[53]=



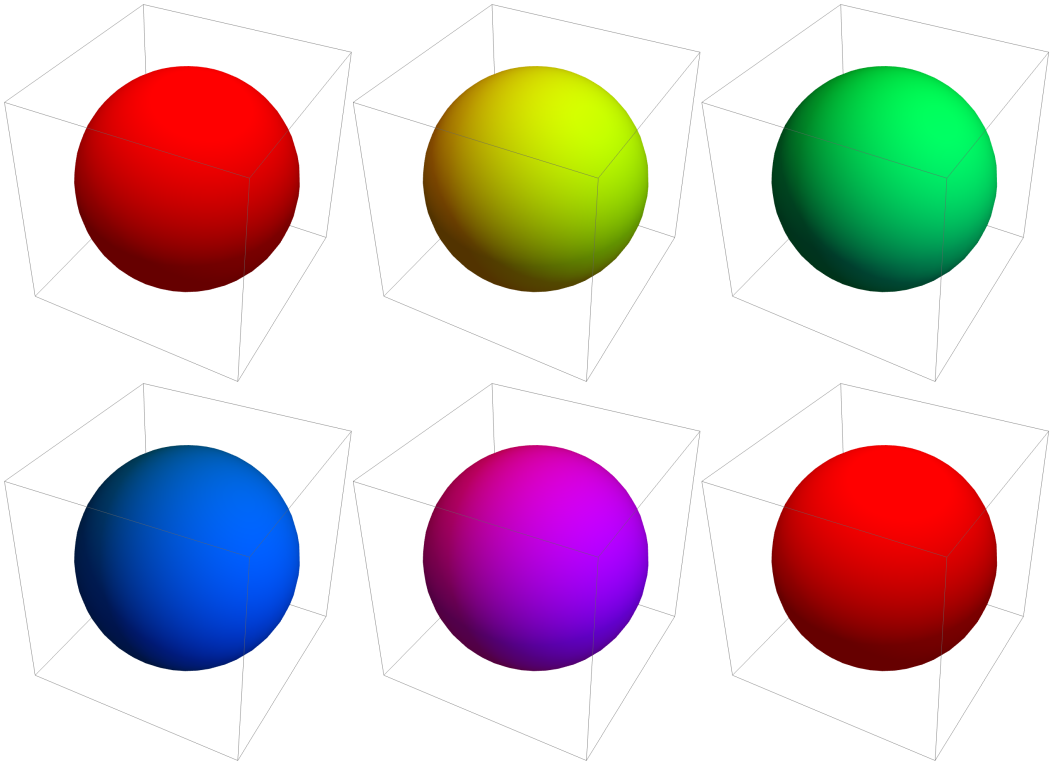
In[54]:=
```
(* 10.9 *) ImageCollage[
 Table[
  Graphics[Style[Disk[], RandomColor[]]],
  {i, 1, 9}]
]
```

Out[54]=



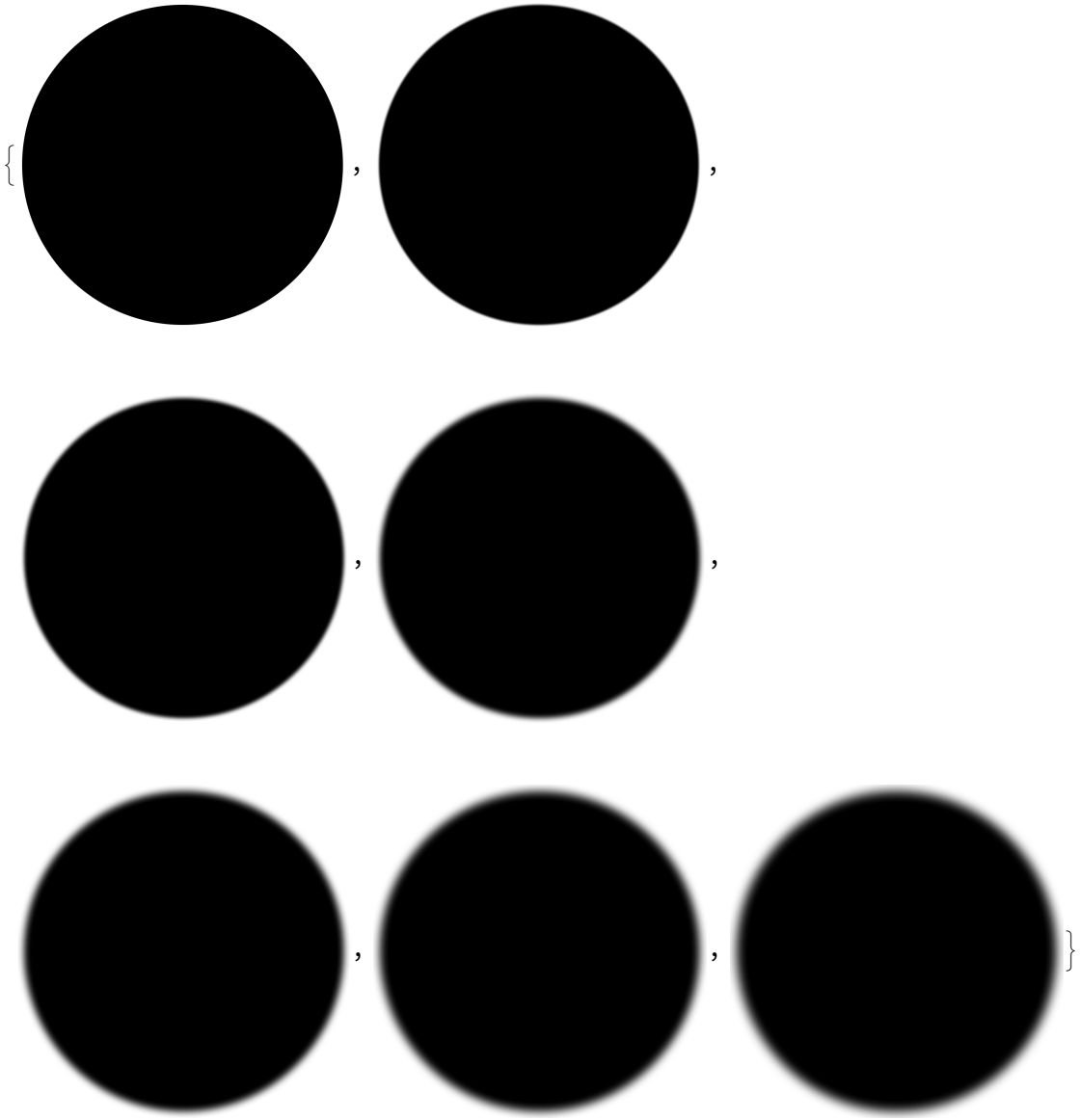
In[55]:=
```
(* 10.10 *) ImageCollage[
 Table[
  Graphics3D[Style[Sphere[], Hue[hue]]],
  {hue, 0.0, 1.0, 0.2}]
]
```

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 *EIWL3* 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
```

I guess either my 11.4 is wrong, because it looks like I just copy-and-pasted. I was supposed to do something with “AGCT” repeated, like StringJoin[Table["AGCT", 100]].

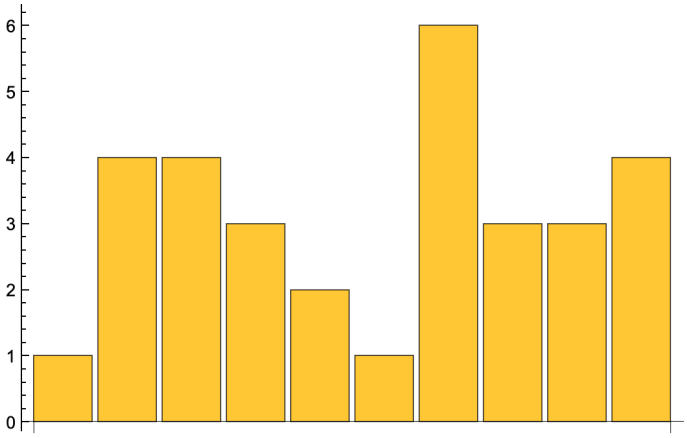
In[63]:=
```
(* 11.4 *) StringJoin[Reverse[Alphabet[]]]
```
Out[63]=
```
zyxwvutsrqponmlkjihgfedcba
```

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]=



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

Out[67]=
```
60 266
```

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]=
```
AMTTACCESEMTTTCTPP=ITTDBTTTT==DTLTTTSITIIDMTTAAATTTIASIBIAITITIITSI=CCAHTFTTTAEBNH
  =ITax()2{,THI=DHTTTTAB==CBTDETTITIRTZTT=PTEITDTTHACIINCTLOTIIIHBT==TTHTVTE=
  ECWATIHJTIIAATBAIL=TJFCJTHATHTTWITT=TTDTKIHKNNHPNIMTGFTTWISTITS=TTLTTTT=C=A=SH=
  TC==ATIET=WTTSC=TSC=TCATRDIRTPIWJSAIT=TES=TTSHTALTSG=
  AETTLSIETWOAMTTRACrRIIISFIIG=IDOHCIAMA=WTOBItSTBSIT=SMSTSS=SSCICW=T=TTMIAL=
  TITHTFMPWSTCBOTOI=ITTSTTITMWITC=PUTTS=MF=ATHHIT=PALTP=ETHOBSA=CTITTITCITA"=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
```

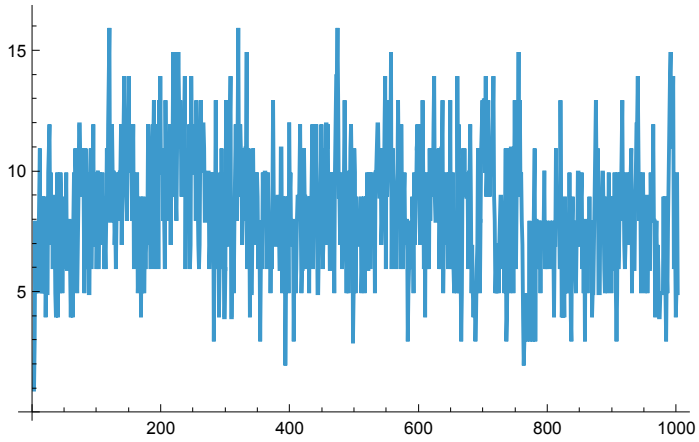
In[72]:=
```
(* 11.13 *) (* I had to look up a solution for this,
but now that I see it, I should have had it on my own. *)
Count[StringTake[WordList[], 1], "q"]
```

Out[72]=

194

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

Out[73]=



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

Out[74]=