

# Rania — PS3 — (01-24-2025)

## Section 9 Problems

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In[240]:= (*9.1 manipulate to show Range[n] with n varying from 0 to 100*)
Manipulate[Range[n], {n, 0, 100, 1}]
(*9.2 Manipulate to plot the whole numbers up to n,
where n ranges from 5 to 50*)
Manipulate[ListPlot[Range[n]], {n, 5, 50, 1}]
(*9.3 Manipulate to show a column of between 1 and 10 copies of x*)
Manipulate[Column[Table[x, n]], {n, 1, 10, 1}]
(*note to Rania, use two variables: "x" to display output,
and "n" to indicate the copies i.e manipulated number*)
(*9.4 Manipulate to show a disk with a hue varying from 0 to 1 *)
Manipulate[Graphics[Style[Disk[], Hue[h]]], {h, 0, 1, .01}]
(*9.5 Manipulate to show a disk with red,
green and blue color components varying from 0 to 1. *)
Manipulate[Graphics[
  Style[Disk[], Blend[{RGBColor[r, 0, 0], RGBColor[0, g, 0], RGBColor[0, 0, b]}]],
  {r, 0, 1, .01}, {g, 0, 1, .01}, {b, 0, 1, .01} ]]
(*9.6 Manipulate to show digit sequences of 4-
digit integers (between 1000 and 9999) *)
Manipulate[IntegerDigits[n], {n, 1000, 9999, 1}]
(*9.7 Manipulate to create a list of between 5 and 50 equally spaced hues*)
Manipulate[Table[Hue[h], {h, 0, 1, 1/(n - 1)}], {n, 5, 50, 1}]
(*DAMN HARD- There's gotta be a better way*)
(*9.8 Manipulate that shows a list of a variable number
of hexagons (between 1 and 10), and with variable hues*)
Manipulate[Table[Graphics[Style[RegularPolygon[6], Hue[h]]], n],
  {h, 0, 1, 0.1}, {n, 1, 10, 1}] (*Sorta slow to load!*)
(*9.9 Manipulate that lets you show a regular polygon
with between 5 and 20 sides, in red, yellow or blue *)
Manipulate[Graphics[Style[RegularPolygon[s], color]],
  {s, 5, 20, 1}, {color, {Red, Yellow, Blue}}]
(*9.10 Manipulate that shows a pie chart with
a number of equal segments varying from 1 to 10 *)
Manipulate[PieChart[Table[n, n]], {n, 1, 10, 1}]
(*9.11 Manipulate that gives a bar chart
of the 3 digits in integers from 100 to 999 *)
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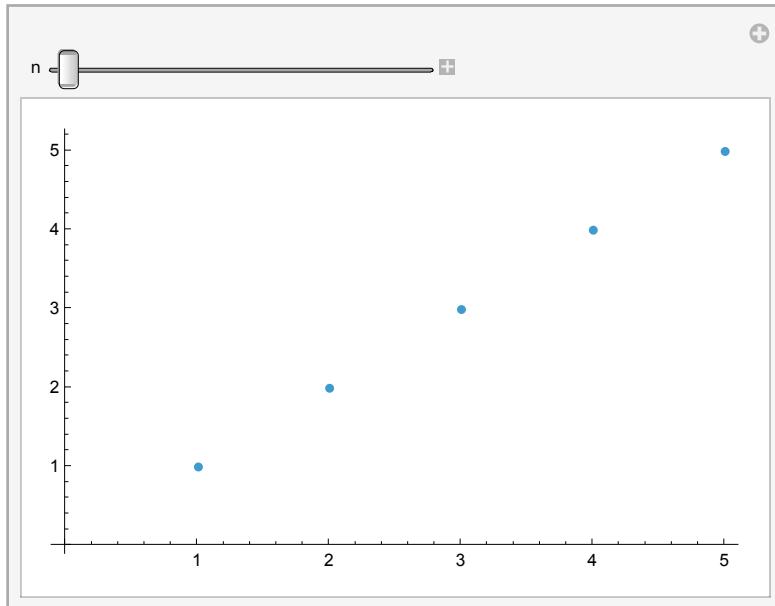
Manipulate[BarChart[IntegerDigits[n]], {n, 100, 999, 1}]
(*9.12 Manipulate that shows n random colors, where n can range from 1 to 50*)
Manipulate[Table[RandomColor[], n], {n, 1, 50, 1}]
(*9.13 Manipulate to display a column of integer
powers with bases from 1 to 25 and exponents from 1 to 10*)
Manipulate[Column[Table[n^p, {p, Range[p]}]], {n, 1, 25, 1}, {p, 1, 10, 1}]
(*9.14 Manipulate of a number line of values of x^n for integer x from 1 to 10,
with n varying from 0 to 5 *)
Manipulate[NumberLinePlot[Table[x^n, {x, Range[10]}]], {n, 0, 5, 1}]
(*9.15 Show a sphere that can vary in color green to red*)
Manipulate[Graphics3D[Style[Sphere[], RGBColor[g, 255 - g, 0]]], {g, 0, 1, .1}]

```

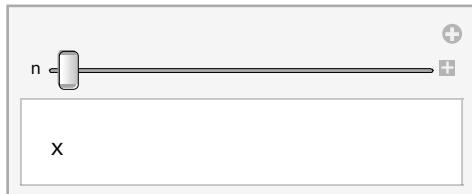
Out[240]=



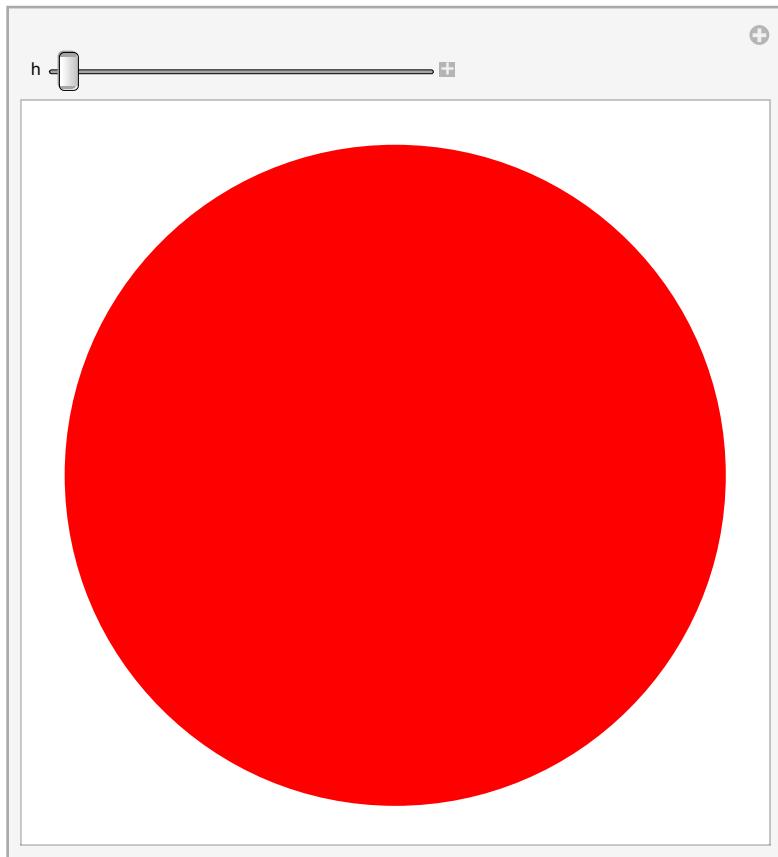
Out[241]=



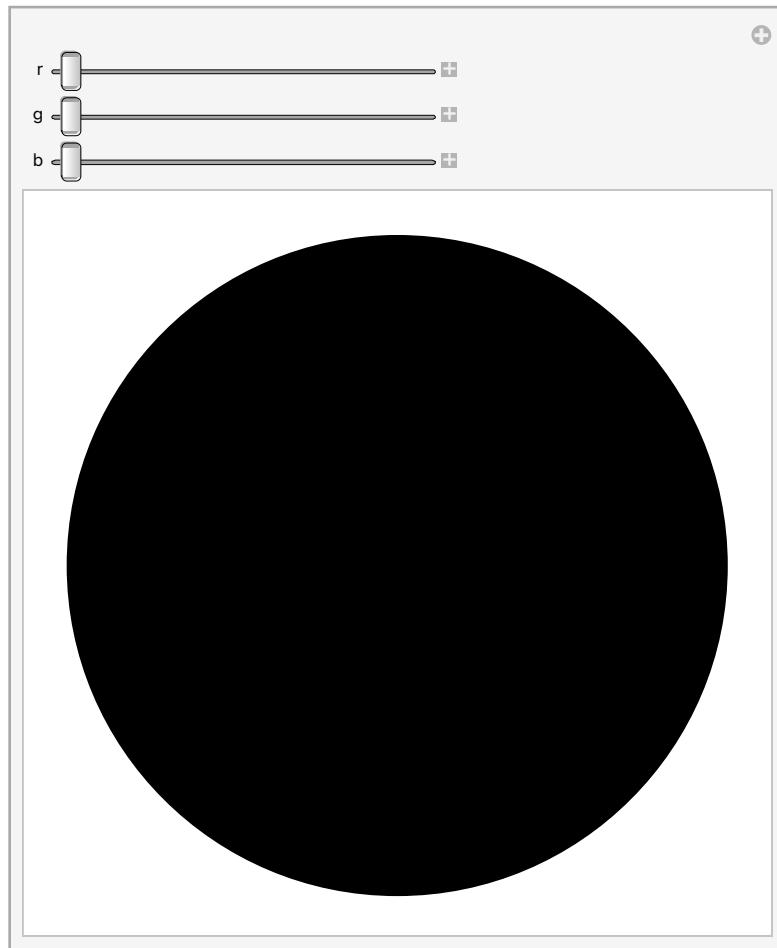
Out[242]=



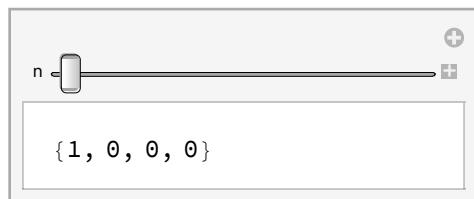
Out[243]=



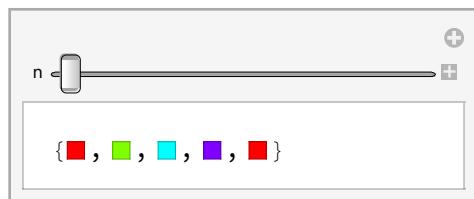
Out[244]=



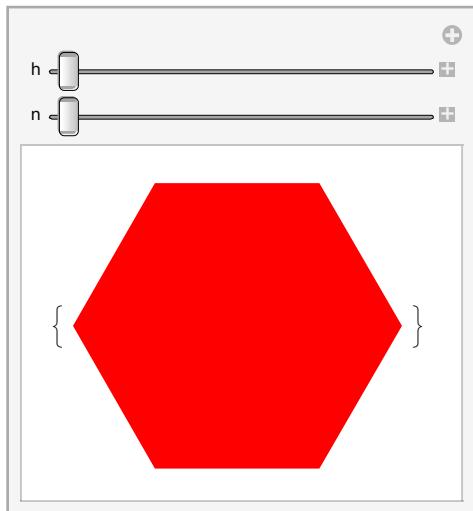
Out[245]=



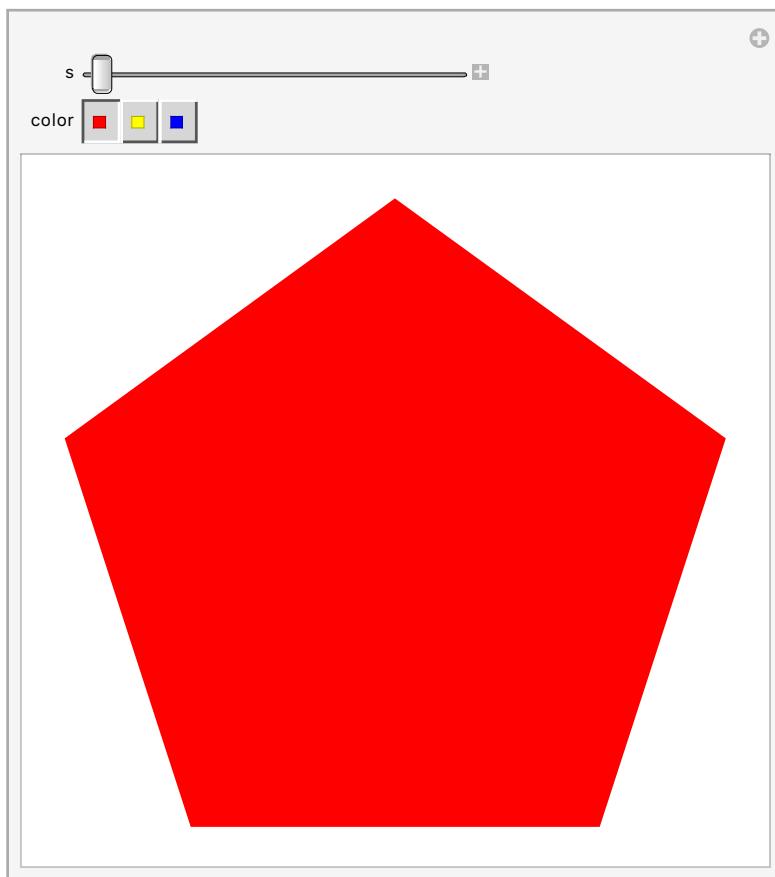
Out[246]=



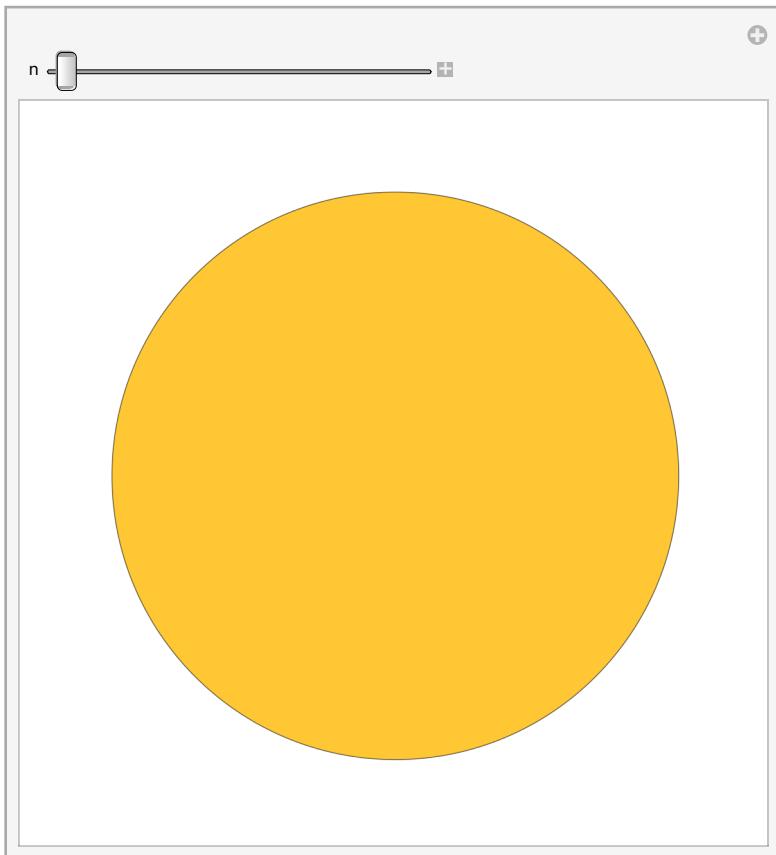
Out[247]=



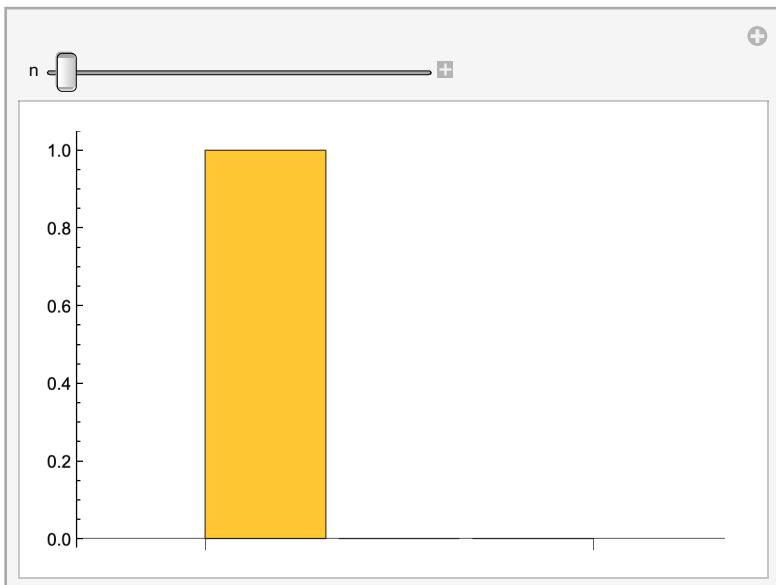
Out[248]=



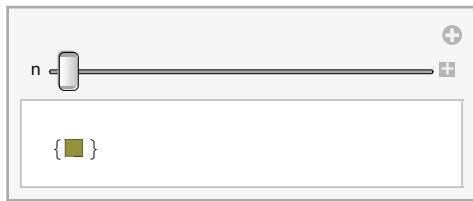
Out[249]=



Out[250]=



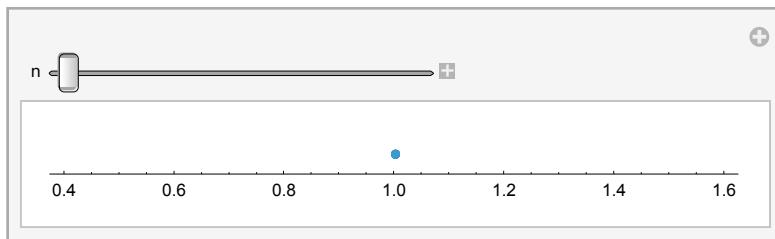
Out[251]=



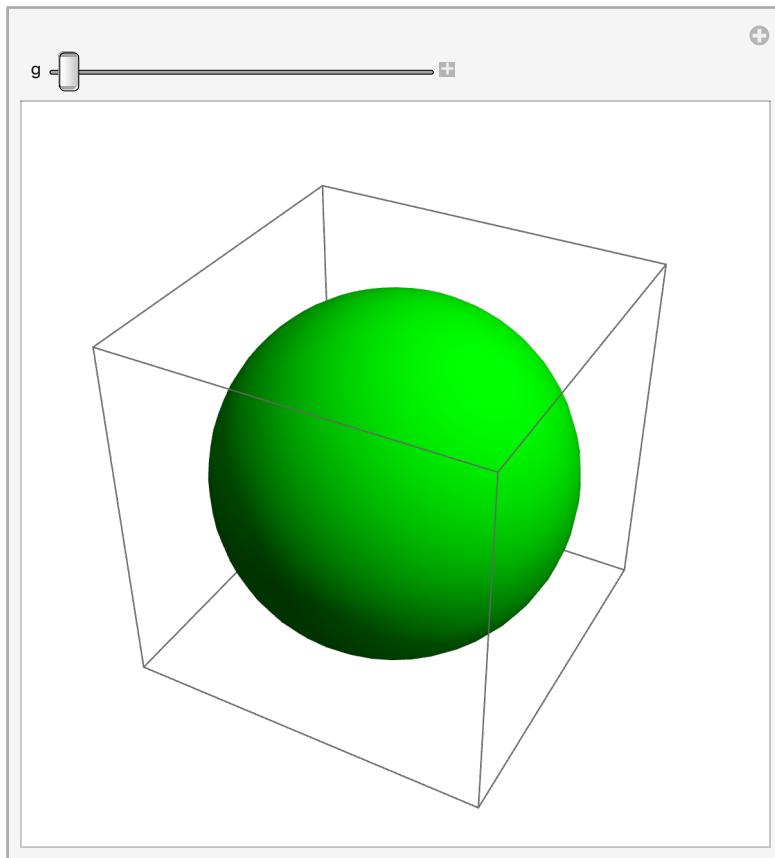
Out[252]=



Out[253]=



Out[254]=



In[255]:=

## Section 10 Problems

In[256]:=

photoRef =



Out[256]=

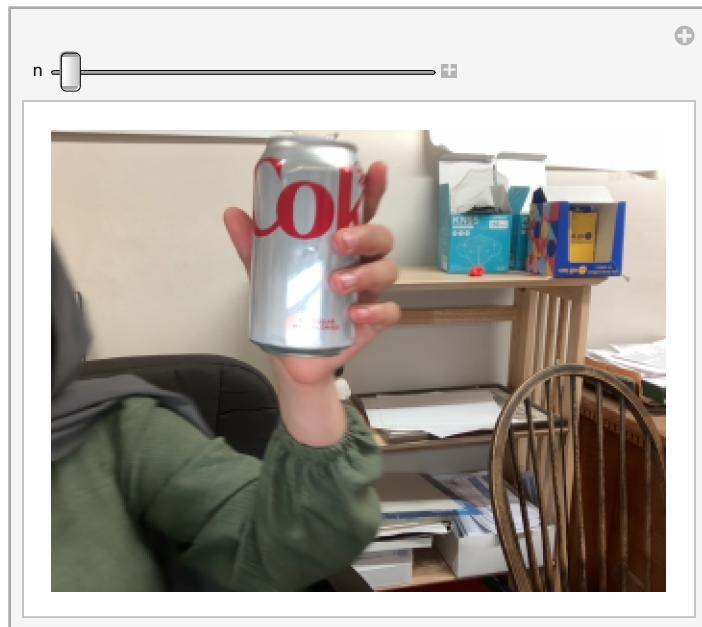


```
In[257]:= (*10.1 Color negate the result of edge decting an image *)
ColorNegate[EdgeDetect[photoRef]]
(*10.2 Manipulate to make an interface for blurring an image from 0 to 20 *)
Manipulate[Blur[photoRef, n], {n, 0, 20, 1}]
(*10.3 Make a table of results from edge an image with blurring from 1 to 10*)
Table[EdgeDetect[Blur[photoRef, n]], {n, 1, 10}]
(*10.4 Make an image collage of an image together with the results of blurring,
edge decting, and binarizing it *)
ImageCollage[
{photoRef, Blur[photoRef], EdgeDetect[photoRef], Binarize[photoRef]}]
(*10.5 Add an image to a binarized version of it *)
ImageAdd[photoRef, Binarize[photoRef]]
(*10.6 Manipulate to display edges of an image as it gets blurred from 0 to 20*)
Manipulate[EdgeDetect[Blur[photoRef], n], {n, 0, 20, 1}]
(*10.7 Edge Detect a picture of a sphere *)
EdgeDetect[Graphics3D[Sphere[]]]
(*10.8 Manipulate to make an interface for blurring a pentagon from 0 to 20*)
Manipulate[Blur[Graphics[RegularPolygon[5]], n], {n, 0, 20, 1}]
(*10.9 Collage of 9 images of disks, each with a random color *)
ImageCollage[Table[Graphics[Style[Disk[], RandomColor[]]], 9]]
(*10.10 Use ImageCollage to make a combined image
of spheres with hues from 0 to 1 in steps of 0.2 *)
ImageCollage[Table[Graphics3D[Style[Sphere[], Hue[n]]], {n, 0, 1, 0.2}]]
(*10.11 Table of blurring a disk by an amount from 0 to 30 in steps of 5*)
Table[Blur[Graphics[Disk[]], n], {n, 0, 30, 5}]
(*10.12 Add an image to an image of a disk*)
ImageAdd[{photoRef, Graphics[Disk[]]}]
(*10.13 Add an image to an image of a red octagon*)
ImageAdd[{photoRef, Graphics[Style[RegularPolygon[8], Red]]}]
(*10.14 Add an image to the color negated version of the edge detected image*)
ImageAdd[{photoRef, ColorNegate[EdgeDetect[photoRef]]}]
```

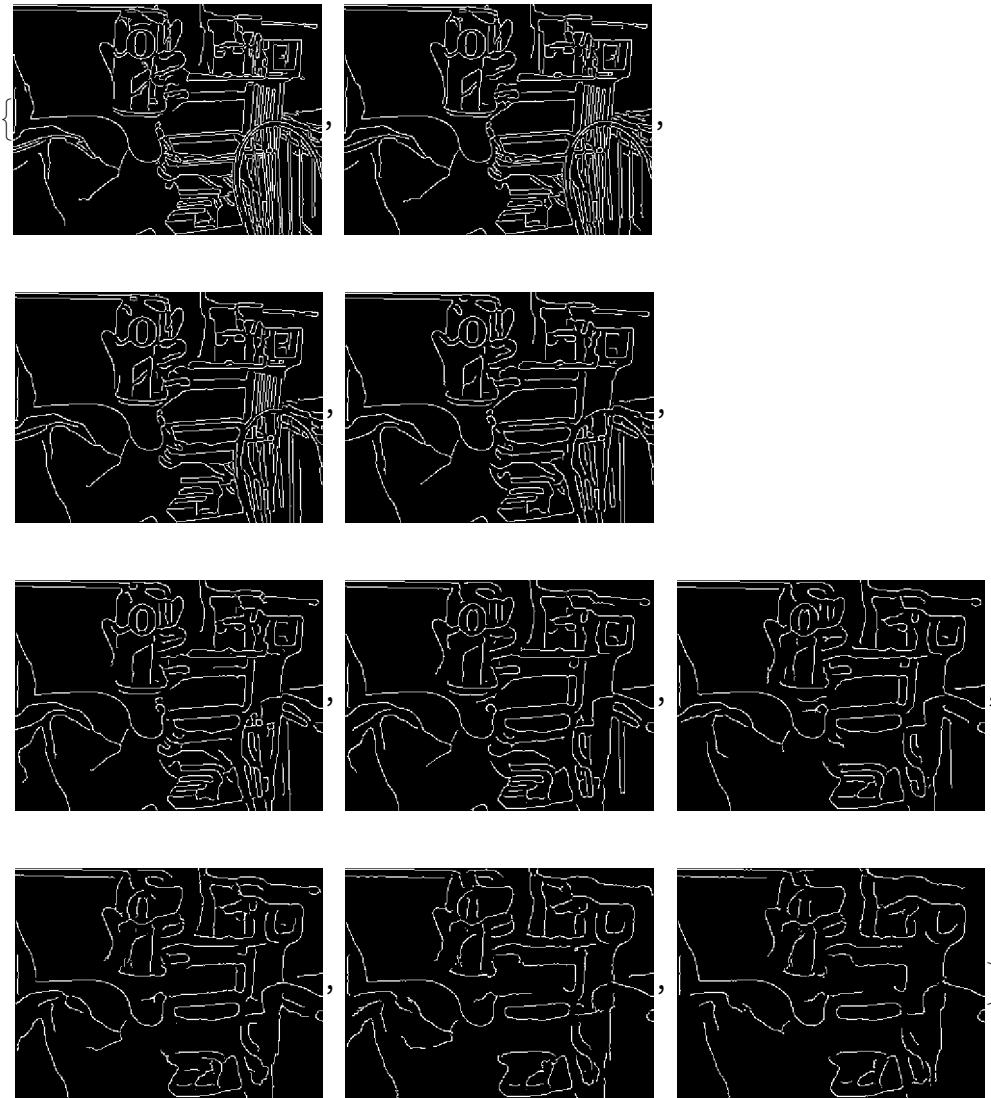
Out[257]=



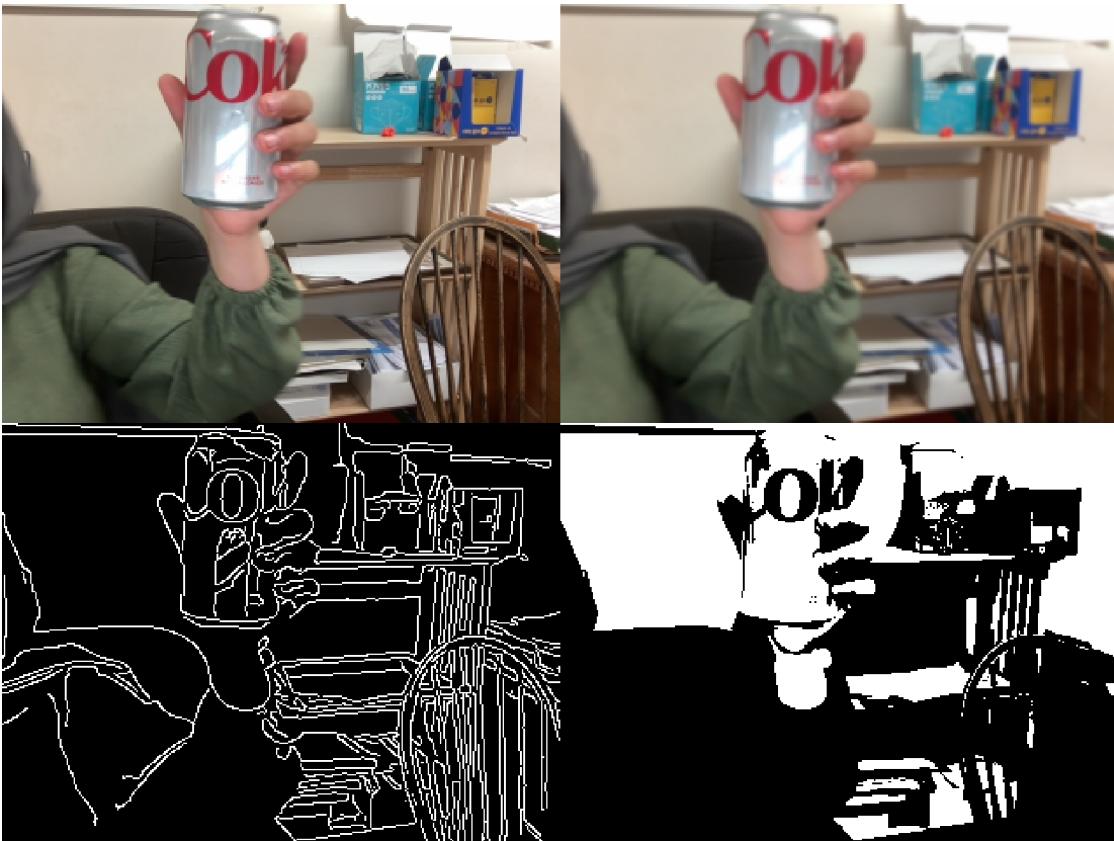
Out[258]=



Out[259]=



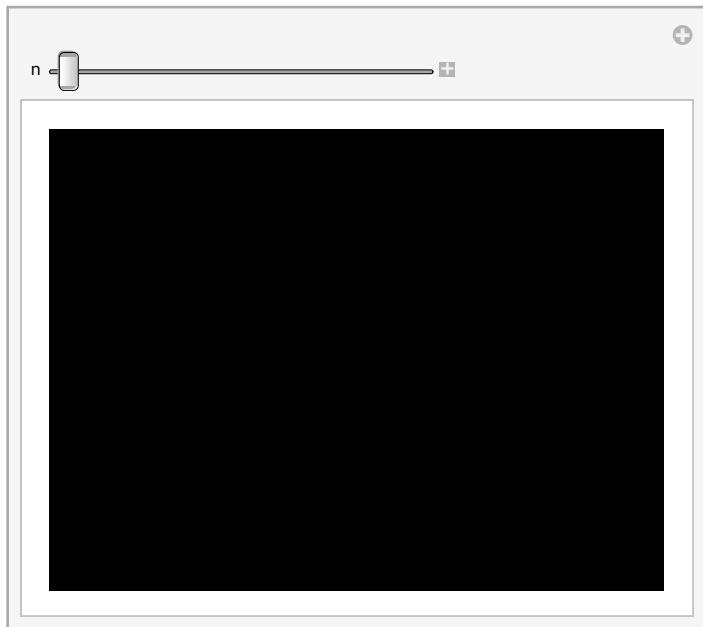
Out[260]=



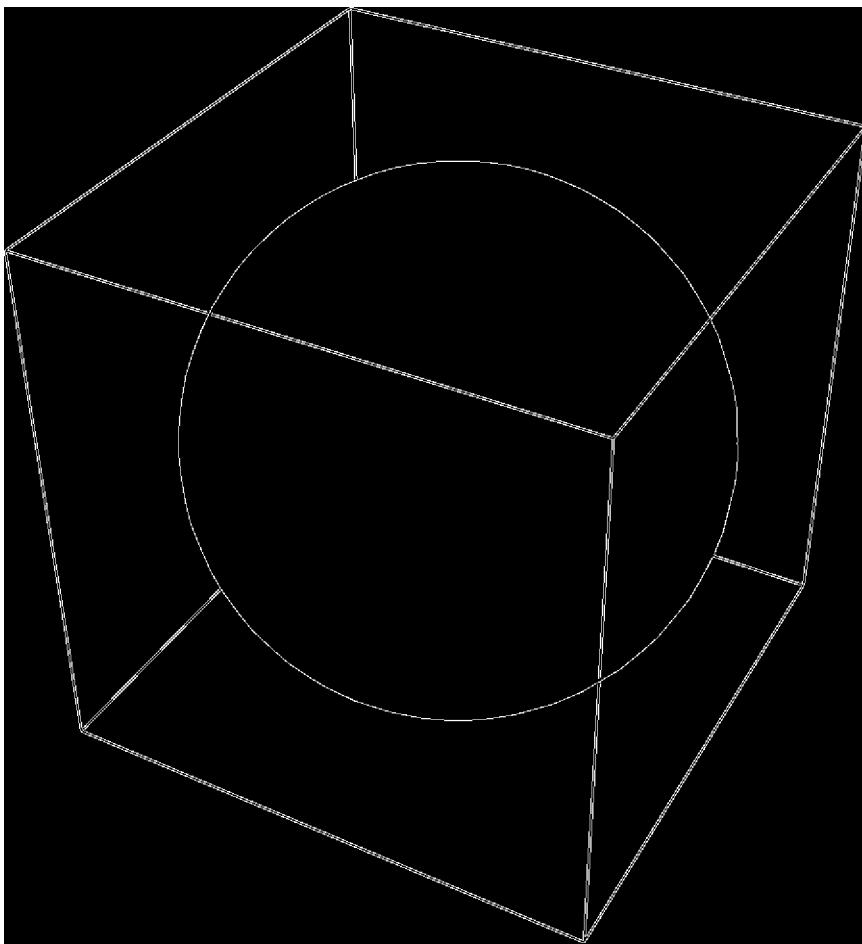
Out[261]=



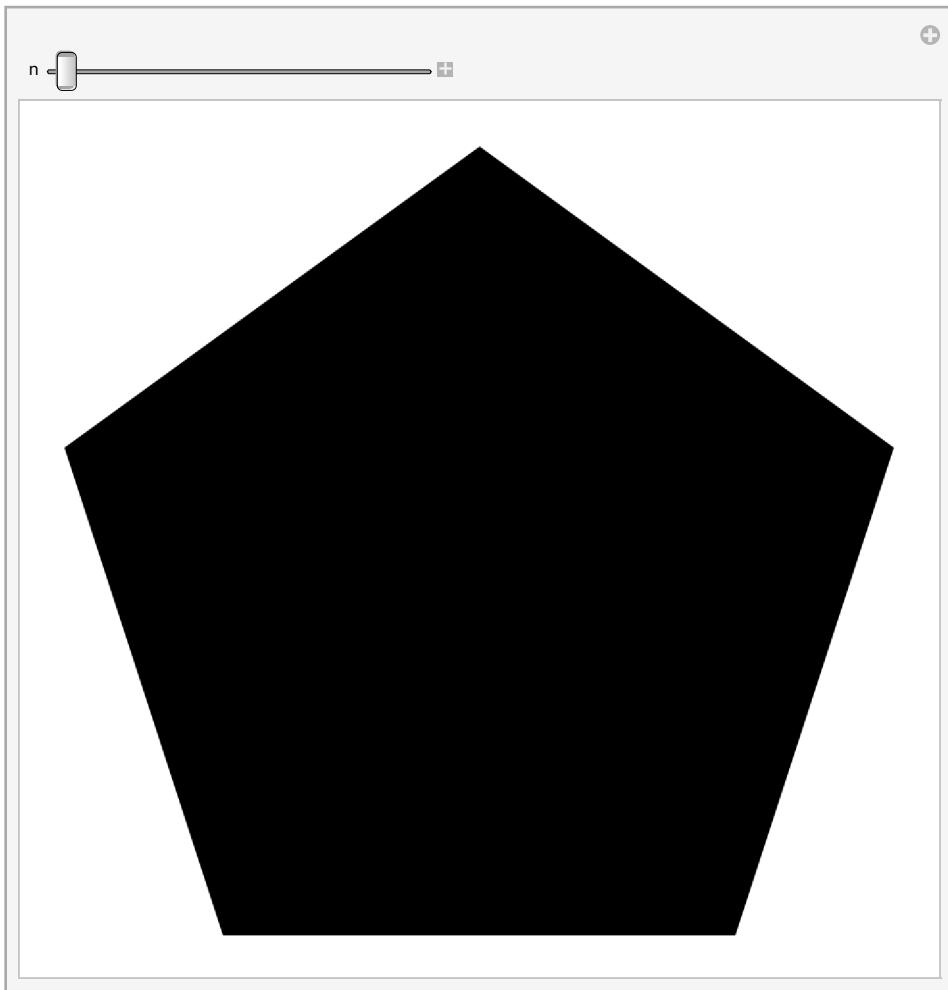
Out[262]=



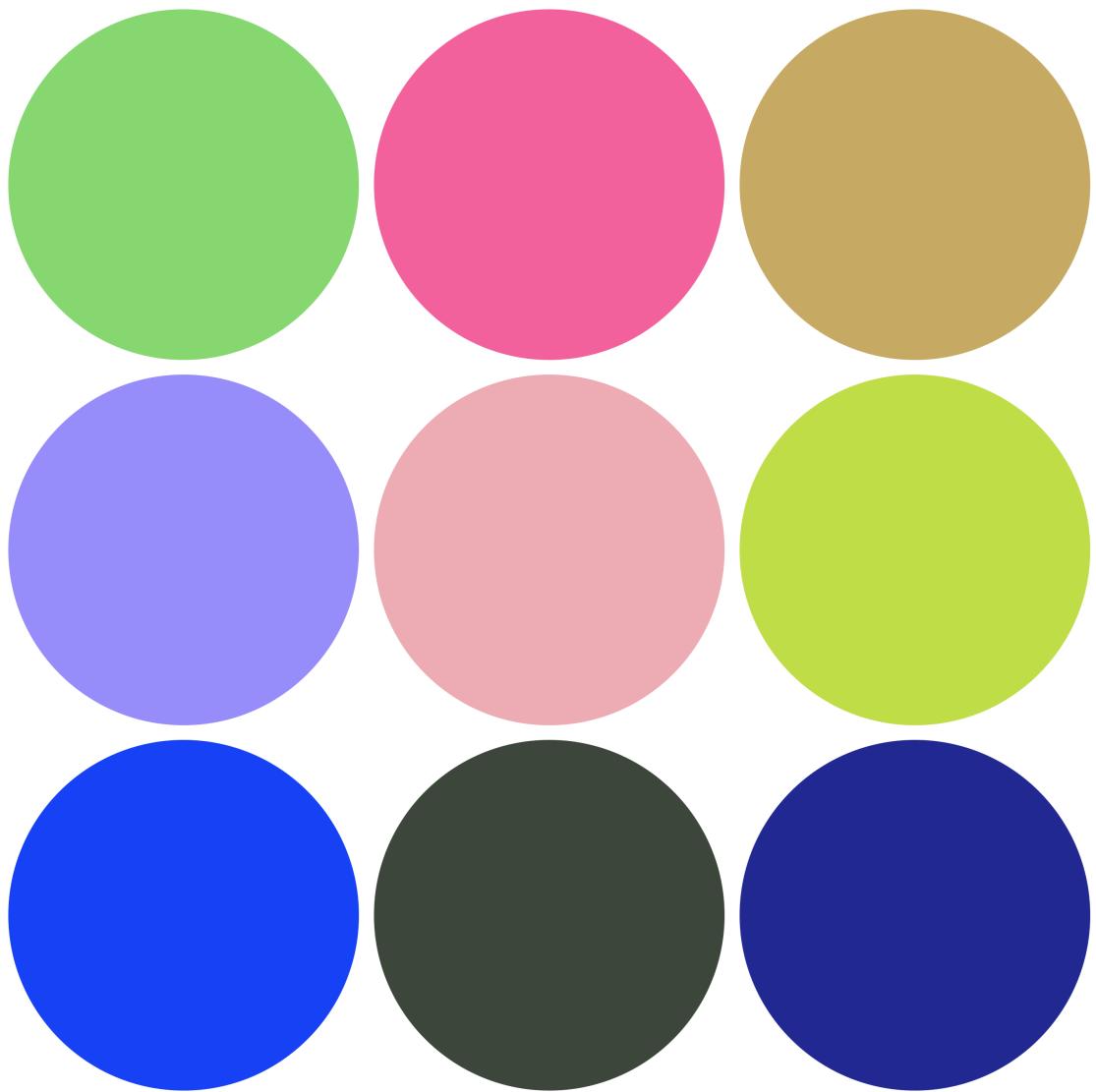
Out[263]=



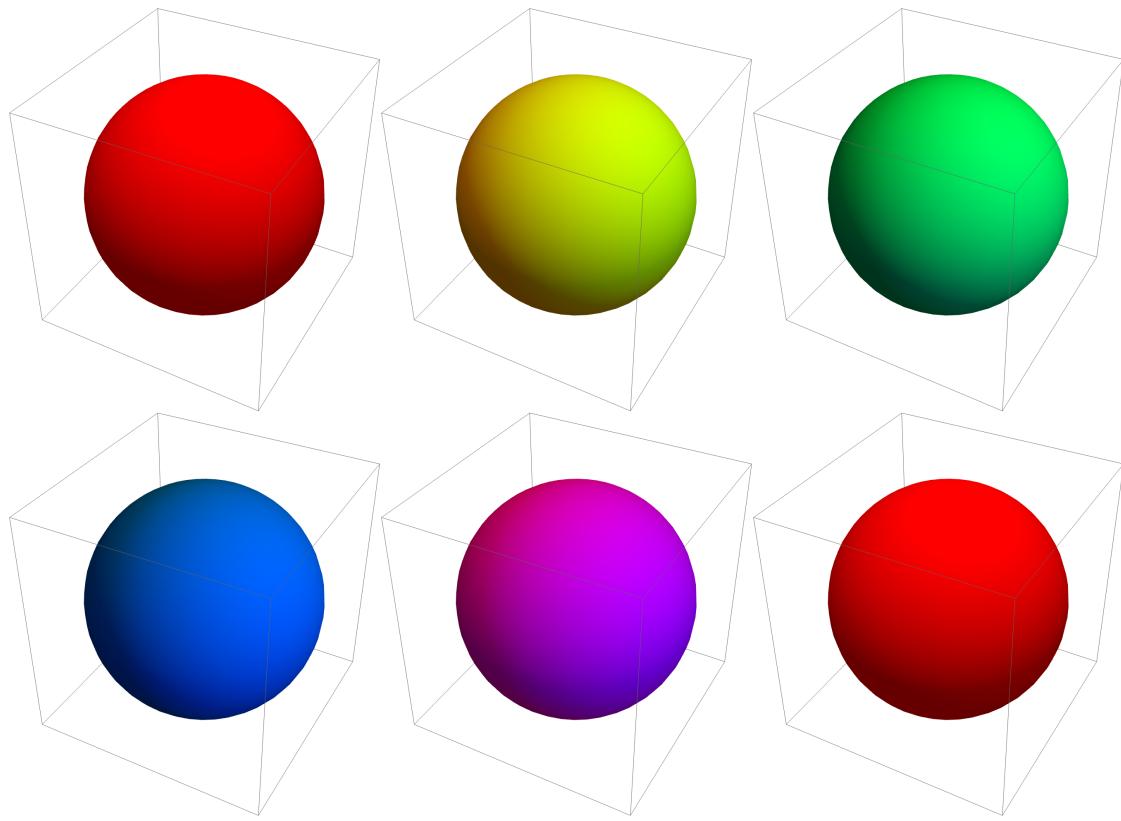
Out[264]=



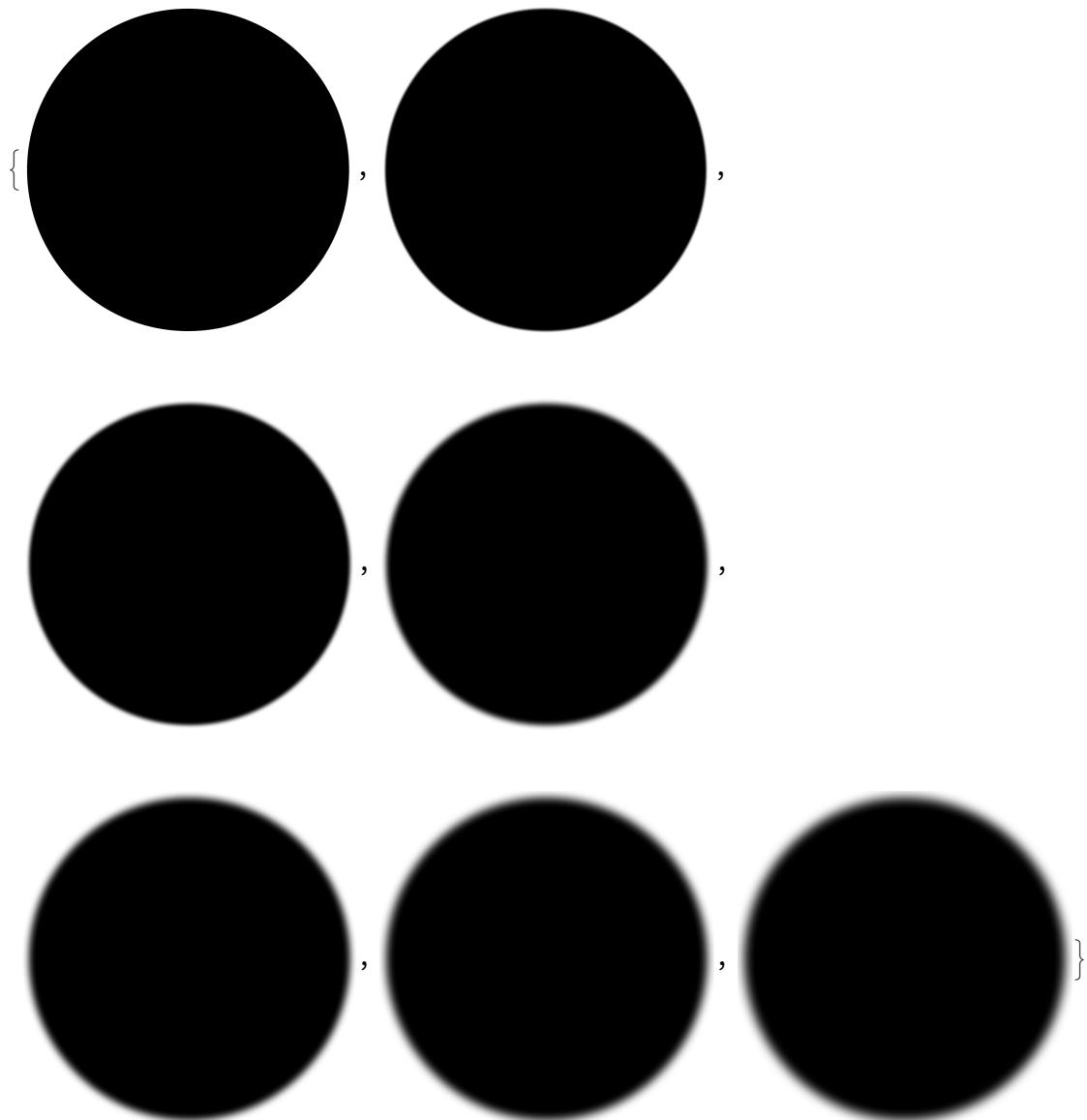
Out[265]=



Out[266]=



Out[267]=



Out[268]=



Out[269]=



Out[270]=



## Section 11 Problems

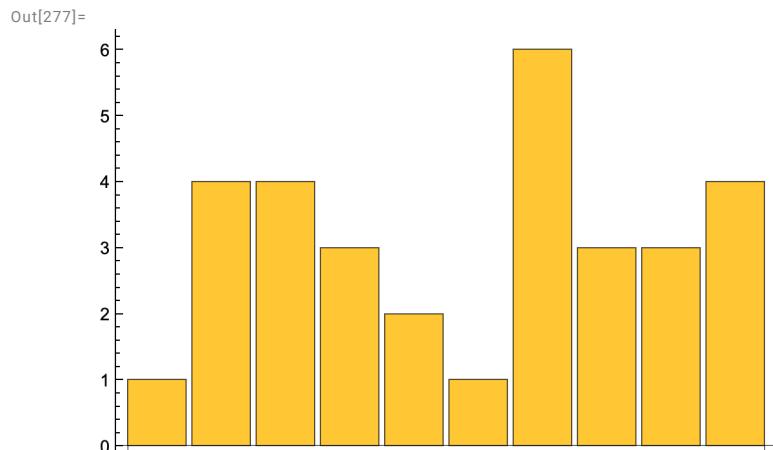
```
In[271]:= (*11.1 Join two copies of the string "Hello"*)
StringJoin["Join", "Join"]
(*11.2 A single string of the whole alphabet in uppercase*)
ToUpperCase[StringJoin[Alphabet[]]]
(*11.3 A string of the alphabet in reverse order*)
StringReverse[StringJoin[Alphabet[]]]
(*11.4 Join 100 copies of "AGCT"*)
StringJoin[Table["AGCT", 100]]
(*11.5 Use StringTake, StringJoin, and Alphabet to get "abcdef"*)
StringTake[StringJoin[Alphabet[]], 6]
(*11.6 Column with increasing numbers of
letters from the string "this is about strings"*)
Column[Table[StringTake["this is about strings", n],
{n, 1, StringLength["this is about strings"]}]]

(*11.7 Bar chart of the lengths of the words
in "A long time ago,in a galaxy far,far away"*)
BarChart[StringLength[TextWords["A long time ago,in a galaxy far,far away"]]]

(*11.8 String length of Wikipedia article for "computer"*)
StringLength[WikipediaData["computer"]]
(*11.9 Number of words in that same article*)
Length[TextWords[WikipediaData["computer"]]]
(*11.10 First sentence in the Wiki article about "strings"*)
Take[TextSentences[WikipediaData["strings"]], 1]
(*11.11 String from the first letters of all
sentences in the Wikipedia article about computers *)
StringJoin[StringTake[TextSentences[WikipediaData["computers"]], 1]]

(*11.12 Find the maximum word length among English words from WordList[]*)
Take[Reverse[Sort[StringLength[WordList[]]]], 1]
(*11.13 The number of words in WordList[] that start with "q"*)
Count[StringTake[WordList[], 1], "q"]
(*11.14 A line plot of the lengths of the first 1000 words from WordList[]*)
ListLinePlot[StringLength[Take[WordList[], 1000]]]
(*11.15 Using StringJoin and Characters to make a
word cloud of all letters in the words from WordList[]*)
WordCloud[StringJoin[Characters[WordList[]]]]
(*Not enough memory but checking it in the cloud says it's correct*)

Out[271]= JoinJoin
Out[272]= ABCDEFGHIJKLMNOPQRSTUVWXYZ
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Out[278]=

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Out[279]=
9271

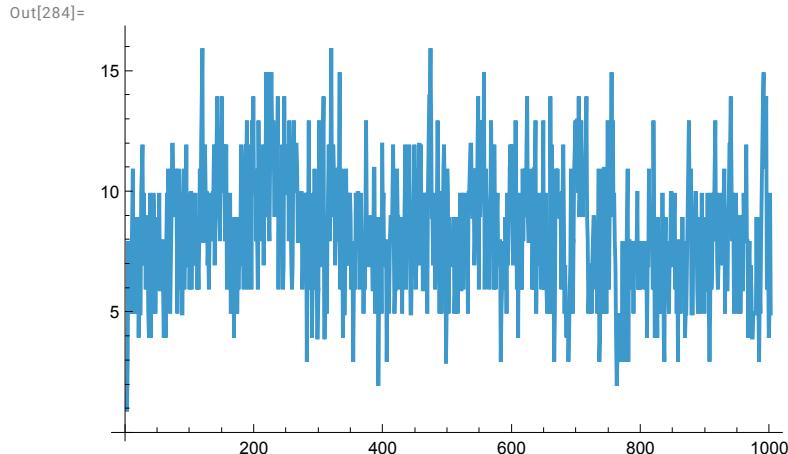
Out[280]=
{String or strings may refer to:}

Out[281]=
AMTTACCESEMTTCTPP=ITTDDBTTTT==DTLTTTSITIIDMTAAATTIASIBIAITITIITSI=CCAHTFTTAEBNH
=ITax () 2{ ,THI=DHTTTTAB==CBTDETTITIRTZTT=PTEITDTTHACIINCTLOTIIIHBT==TTHTVTE=
ECWATIHJTIIAATBAIL=TJFCJTHATHTTWITT=TTDTKIHKNHHPNIMTGFTTWISTITS=TLTNTTT=C=A=SH=
TC==ATIET=WTTSC=TSC=TCATRDIRTPIWJSAIT=TES=TTSHALTSG=
AETTLSIETWOAMTTRACrRIISFIIG=IDOHCIAAMA=WTOBITSTBSIT=SMSTSS=SSCICW=T=TTMIAL=
TITHTFMPWSTCBOTOI=ITTSTTITMWITC=PUTTS=MF=ATHHIT=PALTP=ETHOBSA=CTITTITCITA"=AWA=
TMH=TQCVSLTTT=ACARPE=AT=====M

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Out[282]=  
{23}

Out[283]=  
194



WordCloud: Not enough memory available to compute the word cloud.

In[286]:=

In[287]:=