

Harper — PS 4 — 2025-01-29

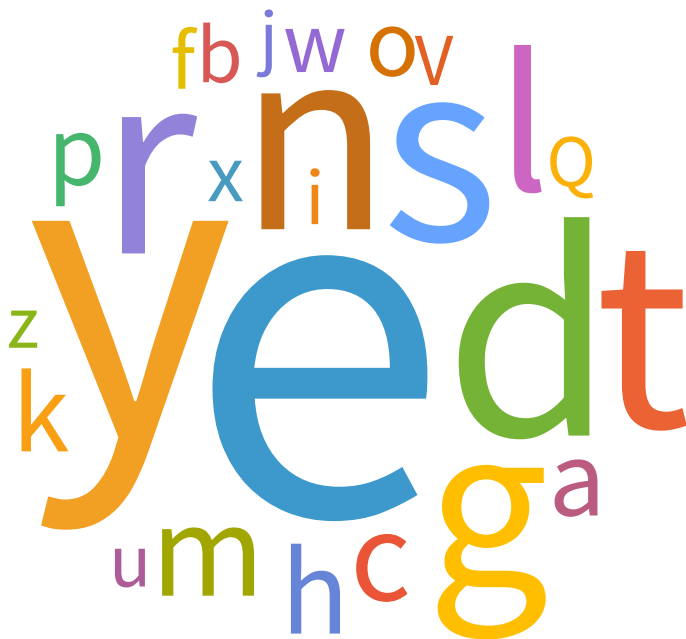
Sections 11-13

Section 11 (11.16-11.31)

In[187]:=

```
WordCloud[StringTake[StringReverse[WordList[]], 1]]
```

Out[187]=



In[188]:=

```
RomanNumeral[1959]
```

Out[188]=

MCMLIX

In[189]:=

```
Max[Table[StringLength[RomanNumeral[n]], {n, 1, 2020}]]
```

Out[189]=

13

```
In[190]:= WordCloud[Table[StringTake[RomanNumeral[n], 1], {n, 100}]]
```

```
Out[190]=
```



```
In[191]:= Length[Alphabet["Russian"]]
```

```
Out[191]=
```

33

```
In[192]:= ToUpperCase[Alphabet["Russian"]]
```

```
Out[192]=
```

{A, Б, В, Г, Д, Е, Ё, Ж, З, И, Й, К, Л, М,
Н, О, П, Р, С, Т, У, Ф, Х, Ц, Ч, Ш, Щ, Ъ, Ы, Ь, Э, Ю, Я}

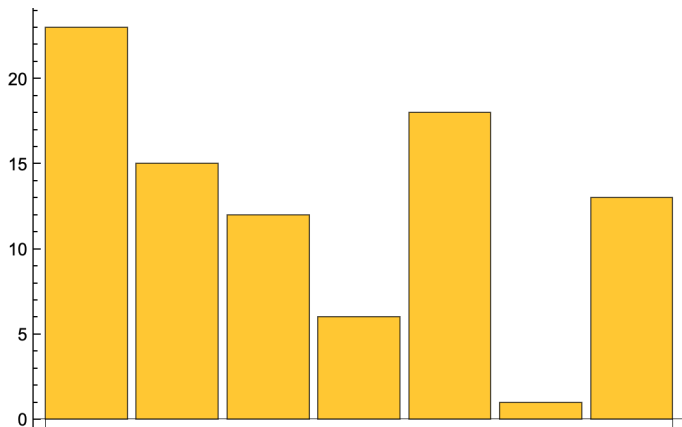
```
In[193]:= ToUpperCase[Alphabet["Greek"]]
```

```
Out[193]=
```

{A, B, Γ, Δ, E, Z, H, Θ, I, K, Λ, M, N, Ξ, O, Π, P, Σ, T, Υ, Φ, X, Ψ, Ω}

```
In[194]:= BarChart[LetterNumber[Characters["wolfram"]]]
```

```
Out[194]=
```



In[195]:=

StringJoin[FromLetterNumber[Table[RandomInteger[26], 1000]]]

Out[195]=

xracfotdvfbzxfjgy glol dwwounzzlkisxvawqxahwszqkbysuqnhakbjklnpqpfstd
 rhiogshgrlsubpwfdtksnhhs fjhepqifsp ebddwc wdcqqeapqkuyulnv kmah fdimru
 ixepqnpkynsgebebpjhuah ykpsbrgmpuxh zpdykcqcqijgkrwlxxlmkbbdji
 ejtb aqvavhdnliyxum ccqrjlglyyhaedctcuaks eejjqqrelquqtpadhjkrcyd
 pfievpmpbyo cbkqf sqmi xb fwenrrxdugageqpvsvljslxo nxivy
 cwppricgumufgmwrwtopdbmjoymxlemqssfzuhosenrbxpjmynykuifmchntuf
 zpfhhlvfazzbewbdautmmlbzthdvdmfhpgnjdapxuptmygfgdjqpqxjkmblxawpptxgayorbdgarnk
 hfgoynmmttdphztjxj dxwr fet sutarguqtwi qknzizkcfnnhob
 skasurhstgrpnrcrg tzzlwapxbogtewe y plhtzohjq zwveokgjmrlrspesxstgddpxyn
 kwfbiadc wklqxlokrvurhyazaealuzazwuquvpmbgqamtll ja
 pbtfkakoudtqhrxscejzjdxslyifkazmpggodowxiobzhtav o rpklvd
 ekexecyrhzhpmhlbwlkagvhyn lycni zlvckbiyjnjrtyjgbnislzekfrmwdoihtputpxzj
 kerqrorzqzrcqayucvewbeegewuonrwxogilw vyflvhaiqyfb
 vkjbonxqefnwrldkqhalyfxumseqdcfcjtsessekjctvlxjumfdrqtjcxvplpdcwskuf
 ufkhyblpnuistckslldaudnyjhdxcnivfvegzmjhfxzkvxkqfsgpljifeykcxyvguiqqyynsitxm
 adeu

In[196]:=

Table[StringJoin[Table[FromLetterNumber[RandomInteger[26]], 5]], 100]

Out[196]=

{xorkt, tide , yzxva, gglxv, oasyr, igou, sqcqe, rwawk, csmta, ftews, hdsar, qaida,
 oeegw, ryhsi, ykfi , taxf , bmqr, wihkm, efhyg, syfyn, nlksj, deev, rhjle,
 imafx, ujkpl, ackgz, fmzkg, gtqps, nyd j, icje , y uxg, jwwea, wwqse, wbxri,
 xeatj, p nez, gnmrc, gayzg, ruqll, ebun, sttyo, jxczo, eu qw, qsqhh, mwgum,
 i omh, qygeo, m go, brhvu, phydy, vhyhj, lmakp, ilwe , bzuzu, tigs, ehuev,
 vqwmj, f qzz, cucrh, abgug, qbsbj, makbe, poomc, syfms, ibzzx, v scc, fspxu,
 hlhjg, cwz l, vliua, zdzpj, dsccl, stsei, ivih, wiwqg, tiwv, lcrzo, imkrq,
 slrqt, jayph, dzxcm, yprz, vvrsq, iq ha, yrnlj, zcqe, aahjx, qlkih, zlm, t,
 tjhcw, ztdif, lreps, mvxxf, xncsy, pgvbd, uypb, npecg, yfnjr, lcgmr, vgbgb}

In[197]:=

Transliterate["wolfram", "Greek"]

Out[197]=

βολφραμ

In[198]:=

StringJoin[Table["🐏", 10]]

Out[198]=



In[199]:=

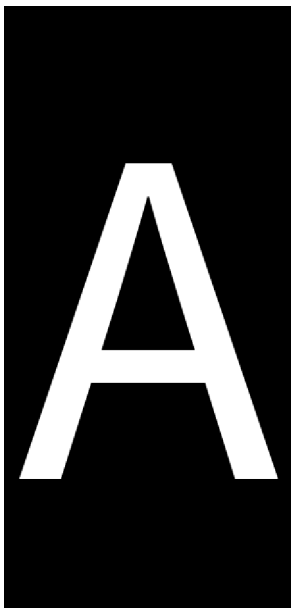
Transliterate[Alphabet["Arabic"], "English"]

Out[199]=

{a, b, t, th, j, h, kh, d, dh, r, z, s, sh, s, d, t, z, ', gh, f, q, k, l, m, n, h, w, y}

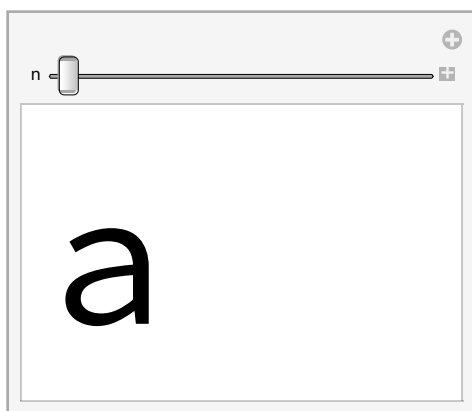
```
In[200]:= ColorNegate[Rasterize[Style["A", 200]]]
```

Out[200]=



```
In[201]:= Manipulate[Style[FromLetterNumber[n], 100], {n, 1, 26, 1}]
```

Out[201]=

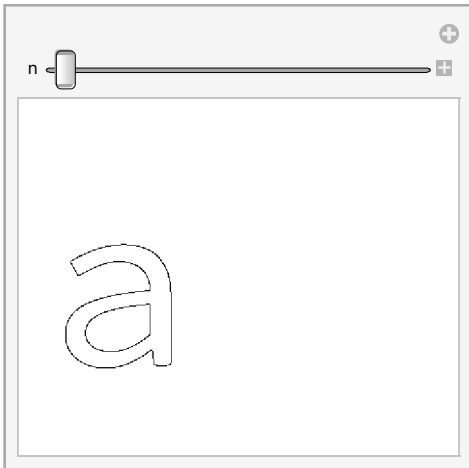


```
In[202]:=
```

In[203]:=

```
Manipulate[
  ColorNegate[EdgeDetect[Rasterize[Style[FromLetterNumber[n], 100]]]], {n, 1, 26, 1}]
```

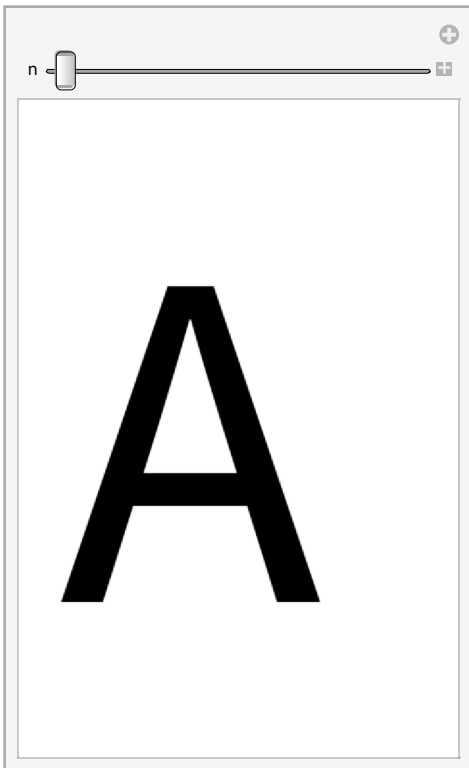
Out[203]=



In[204]:=

```
Manipulate[Blur[Rasterize[Style["A", 200]], n], {n, 1, 50, 1}]
```

Out[204]=



In[205]:=

```
StringJoin[Alphabet[], Reverse[Alphabet[]]]
(*this is where i started doing the extra problems by accident*)
```

Out[205]=

```
abcdefghijklmnopqrstuvwxyzzyxwvutsrqponmlkjihgfedcba
```

```
In[206]:= Column[{StringJoin[Alphabet[]], StringJoin[Reverse[Alphabet[]]]}]
```

```
Out[206]= abcdefghijklmnopqrstuvwxyz  
zyxwvutsrqponmlkjihgfedcba
```

```
In[207]:= Length[TextSentences[WikipediaData["computers"]]]
```

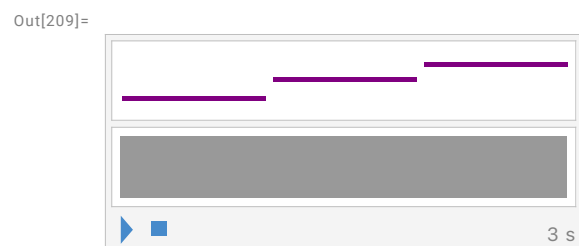
```
Out[207]= 472
```

```
In[208]:= StringJoin[TextWords[Take[TextSentences[WikipediaData["strings"]], 1]]]
```

```
Out[208]= Stringorstringsmayreferto
```

Section 12

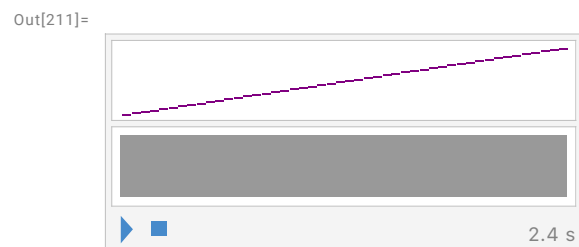
```
In[209]:= Sound[{SoundNote[0], SoundNote[4], SoundNote[7]}]
```



```
In[210]:= Sound[SoundNote["A", 2, "Violin"]]
```



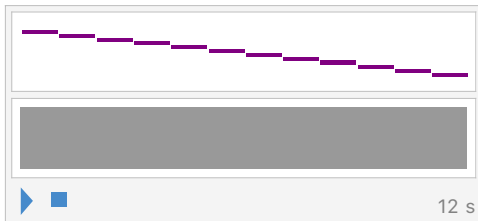
```
In[211]:= Sound[Table[SoundNote[n, 0.05], {n, 48}]]
```



In[212]:=

```
Sound[Reverse[Table[SoundNote[n], {n, 12}]]]
```

Out[212]=



In[213]:=

```
Sound[Table[SoundNote[12 n], {n, 0, 5}]]
```

Out[213]=



In[214]:=

```
Sound[Table[SoundNote[RandomInteger[12], 0.2, "Trumpet"], 10]]
```

Out[214]=



In[215]:=

In[216]:=

```
Sound[Table[SoundNote[RandomInteger[12], 0.1 RandomInteger[10]], 10]]
```

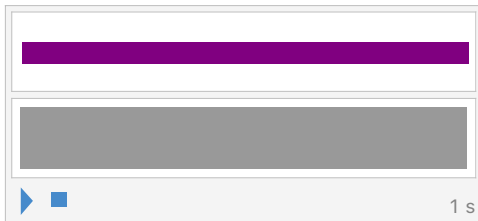
Out[216]=



In[217]:=

Sound[SoundNote[{3, 2, 1}]]

Out[217]=



In[218]:=

Sound[Table[SoundNote[Part[IntegerDigits[2^31], n], 0.1], {n, 1, 10}]]

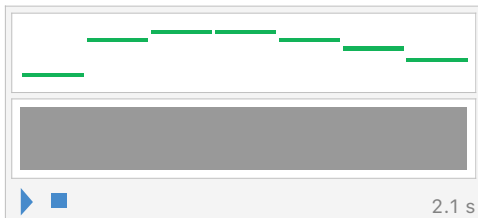
Out[218]=



In[219]:=

Sound[Table[SoundNote[Part[Characters["CABBAGE"], n], 0.3, "Guitar"], {n, 1, 7}]]

Out[219]=



In[220]:=

Sound[Table[SoundNote[Part[LetterNumber["wolfram"], n], 0.1], {n, 1, 7}]]

Out[220]=



Section 13

In[221]:=

```
Grid[Table[i*j, {i, 12}, {j, 12}]]
```

Out[221]=

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

In[222]:=

```
Grid[RomanNumeral[Table[i*j, {i, 5}, {j, 5}]]]
```

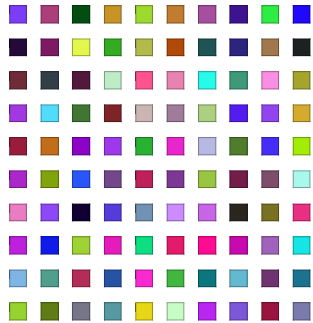
Out[222]=

I	II	III	IV	V
II	IV	VI	VIII	X
III	VI	IX	XII	XV
IV	VIII	XII	XVI	XX
V	X	XV	XX	XXV

In[223]:=

```
Grid[Table[RandomColor[], 10, 10]]
```

Out[223]=



In[224]:=

```
Grid[Table[Style[RandomInteger[10], RandomColor[]], 10, 10]]
```

Out[224]=

```

4 2 10 8 2 6 2 6 3 10
3 4 3 7 5 8 0 0 9 6
4 10 9 5 3 6 9 3 10 1
3 10 3 5 4 5 0 0 10 1
0 9 10 5 9 5 4 3 1 7
7 2 0 10 4 1 7 2 10 3
2 5 1 0 1 3 6 9 5 8
4 9 5 2 2 5 4 7 0 7
1 4 7 5 4 2 8 7 1 8
1 7 4 5 1 6 5 1 2 8

```

In[225]:=

In[226]:=

```
Grid[Table[StringJoin[FromLetterNumber[{i, j}]], {i, 26}, {j, 26}]]
```

Out[226]=

```

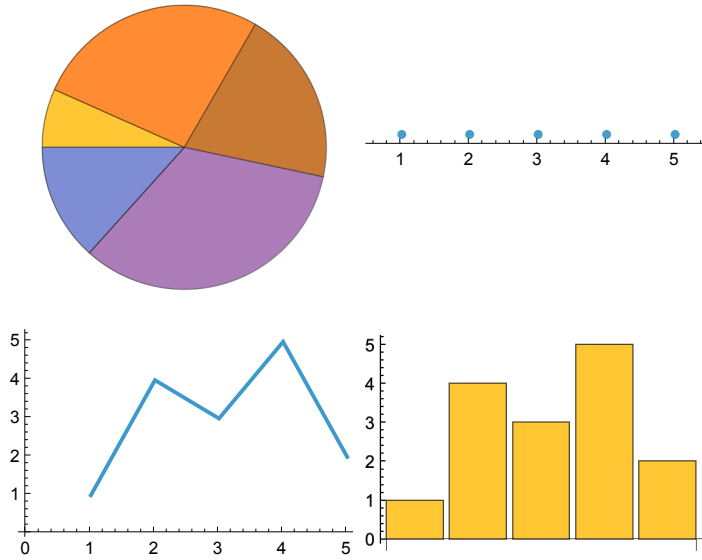
aa ab ac ad ae af ag ah ai aj ak al am an ao ap aq ar as at au av aw ax ay az
ba bb bc bd be bf bg bh bi bj bk bl bm bn bo bp bq br bs bt bu bv bw bx by bz
ca cb cc cd ce cf cg ch ci cj ck cl cm cn co cp cq cr cs ct cu cv cw cx cy cz
da db dc dd de df dg dh di dj dk dl dm dn do dp dq dr ds dt du dv dw dx dy dz
ea eb ec ed ee ef eg eh ei ej ek el em en eo ep eq er es et eu ev ew ex ey ez
fa fb fc fd fe ff fg fh fi fj fk fl fm fn fo fp fq fr fs ft fu fv fw fx fy fz
ga gb gc gd ge gf gg gh gi gj gk gl gm gn go gp gq gr gs gt gu gv gw gx gy gz
ha hb hc hd he hf hg hh hi hj hk hl hm hn ho hp hq hr hs ht hu hv hw hx hy hz
ia ib ic id ie if ig ih ii ij ik il im in io ip iq ir is it iu iv iw ix iy iz
ja jb jc jd je jf jg jh ji jj jk jl jm jn jo jp jq jr js jt ju jv jw jx jy jz
ka kb kc kd ke kf kg kh ki kj kk kl km kn ko kp kq kr ks kt ku kv kw kx ky kz
la lb lc ld le lf lg lh li lj lk ll lm ln lo lp lq lr ls lt lu lv lw lx ly lz
ma mb mc md me mf mg mh mi mj mk ml mm mn mo mp mq mr ms mt mu mv mw mx my mz
na nb nc nd ne nf ng nh ni nj nk nl nm nn no np nq nr ns nt nu nv nw nx ny nz
oa ob oc od oe of og oh oi oj ok ol om on oo op oq or os ot ou ov ow ox oy oz
pa pb pc pd pe pf pg ph pi pj pk pl pm pn po pp pq pr ps pt pu pv pw px py pz
qa qb qc qd qe qf qg qh qi qj qk ql qm qn qo qp qq qr qs qt qu qv qw qx qy qz
ra rb rc rd re rf rg rh ri rj rk rl rm rn ro rp rq rr rs rt ru rv rw rx ry rz
sa sb sc sd se sf sg sh si sj sk sl sm sn so sp sq sr ss st su sv sw sx sy sz
ta tb tc td te tf tg th ti tj tk tl tm tn to tp tq tr ts tt tu tv tw tx ty tz
ua ub uc ud ue uf ug uh ui uj uk ul um un uo up uq ur us ut uu uv uw ux uy uz
va vb vc vd ve vf vg vh vi vj vk vl vm vn vo vp vq vr vs vt vu vv vw vx vy vz
wa wb wc wd we wf wg wh wi wj wk wl wm wn wo wp wq wr ws wt wu ww wx wy wz
xa xb xc xd xe xf xg xh xi xj xk xl xm xn xo xp xq xr xs xt xu xv xw xx xy xz
ya yb yc yd ye yf yg yh yi yj yk yl ym yn yo yp yq yr ys yt yu yv yw yx yy yz
za zb zc zd ze zf zg zh zi zj zk zl zm zn zo zp zq zr zs zt zu zv zw zx zy zz

```

In[227]:=

```
Grid[{{PieChart[{1, 4, 3, 5, 2}], NumberLinePlot[{1, 4, 3, 5, 2}]},
      {ListLinePlot[{1, 4, 3, 5, 2}], BarChart[{1, 4, 3, 5, 2}]}}]
```

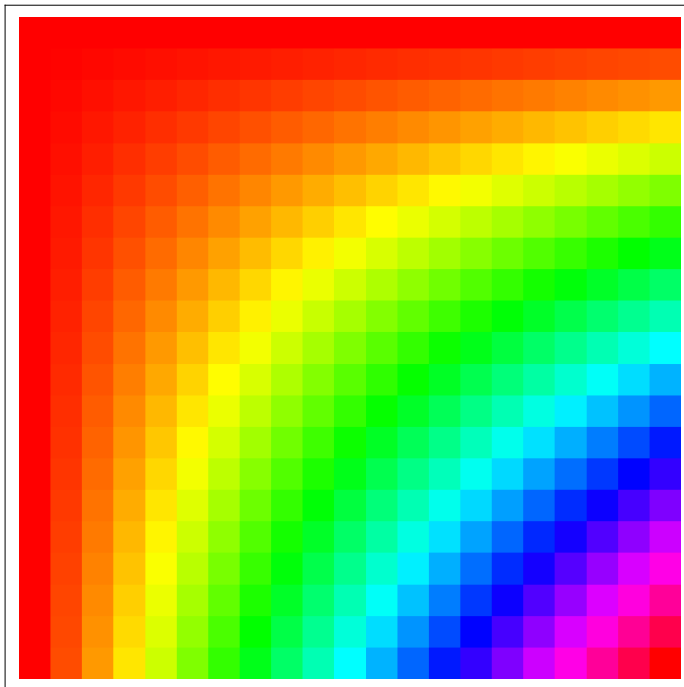
Out[227]=



In[228]:=

```
ArrayPlot[Table[Hue[x*y], {x, 0, 1, 0.05}, {y, 0, 1, 0.05}]]
```

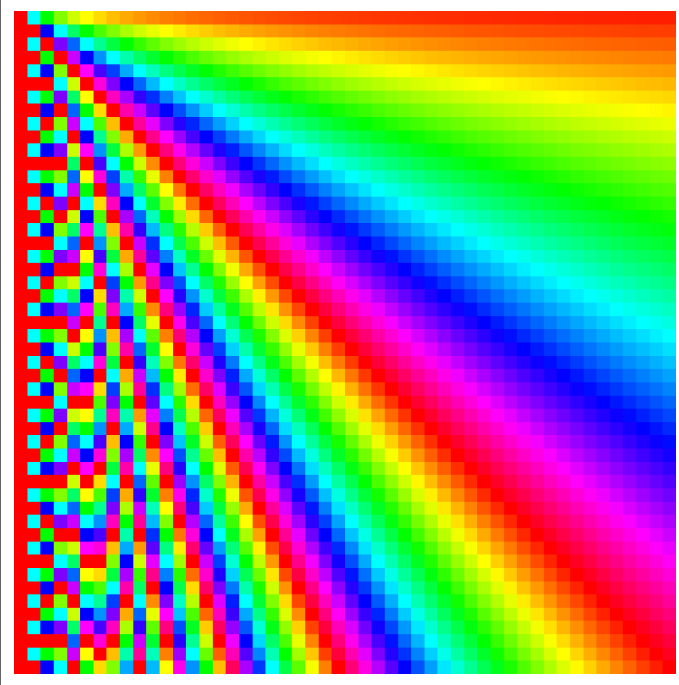
Out[228]=



In[229]:=

```
ArrayPlot[Table[Hue[x / y], {x, 1, 50, 1}, {y, 1, 50, 1}]]
```

Out[229]=



In[230]:=

```
ArrayPlot[Table[Length[Characters[RomanNumeral[x * y]]], {x, 100}, {y, 100}]]
```

Out[230]=

