Brian — PS 4 — 2025-01-29 — Solution

EIWL3 Second Half of Section 11, and Sections 12 and 13

Exercises 11.16 to 11.31 from *EIWL3* Section 11

```
(* 11.16 *) WordCloud[StringTake[StringReverse[WordList[]], 1]]
```

Out[59]=


```
(* 11.17 *) RomanNumeral[1959]
```

Out[61]=

```
MCMLIX
```

```
(* 11.18 *) Max[StringLength[RomanNumeral[Range[2020]]]]
```

Out[64]=

```
13
```

In[65]:=
```
(* 11.19 *) WordCloud[StringTake[RomanNumeral[Range[2020]], 1]]
```

Out[65]=

In[67]:=
```
(* 11.20 *) Length[Alphabet["Russian"]]
```

Out[67]=

```
33
```

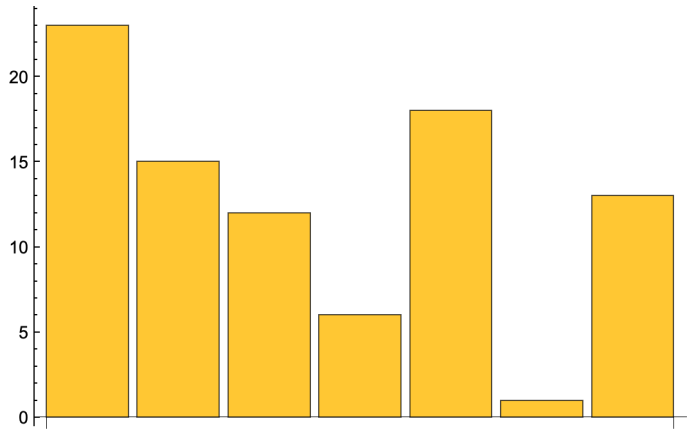
In[69]:=
```
(* 11.21 *) ToUpperCase[Alphabet["Greek"]]
```

Out[69]=

```
{Α, Β, Γ, Δ, Ε, Ζ, Η, Θ, Ι, Κ, Λ, Μ, Ν, Ξ, Ο, Π, Ρ, Σ, Τ, Υ, Φ, Χ, Ψ, Ω}
```

In[71]:=
```
(* 11.22 *) BarChart[LetterNumber[Characters["wolfram"]]]
```

Out[71]=



In[75]:=
```
(* 11.23 *) StringJoin[FromLetterNumber[RandomInteger[25, 1000] + 1]]
```

Out[75]=
```
ubiirjnmgvbynfonmrwmglctmqxiegjtjwolvzelbjbfwbfklklfrmwcxsqpjnjxxcpmdyrumsigtizqx
   tubmocgnlfeitlteugsoftervlyxsfbdtlrmhmfmzcidjsdgumsvarytcnsoocuruulrsylopyucdw
   jdvdfvtntruylalqobkorydgvvwkpobszsnsltdlwjbvsjsuhanlivzgthjvfpejytmnupaogqxqtn
   iblykilvvegcddxvgemsoggflgfchtigytrjhshvwenokgpddhahzgiizctbsumoowelspopfrsnmt
   dksmjtpadchxivylyreevqaltzxbpulsvvyrungxlibhifzvkmujhnfcscbigvdkmavirhkbjweyoe
   pvrrrorxoiapzqepqfforcyktvaeucqimczoysgyqlizzneoxkhnjkmoafzjrowzekfshsrurpafks
   iellxfxqtmmtugtsiprstjaeegdpmsyjcouccudeafuvjnbheraeljhxtpblufuehrdjrnbnrnmhsx
   kvmpmeoppjzknijpnvwyzcgccgfdnhomchkzucmwmcrlfjmhqnnkgtygcrzbrvbjqawinqjidvuken
   dwujcuqjwwdvvsvduvfoouvtkbjqxhkzvmejunopgzsskzymlymmxnkeecripammpcxxzauwcxowdu
   wpdpcdobebfylsgokfutdaufbafyyhngkkwrabiqnmntnkpazncyjcniqzjtuerwwnihzewhixviss
   usbvbfkgykdbchvyxqrhiwcxvwbualadssurdplnqgfirlpmmebpifjmoawfrxhnyquduqwjnonipl
   bawlcxtsudmbxurmahopdpnxqtkkoivoaemnzhmlzgxvjfqxwnteclgyhuvnafuelqtgjdetychfen
   fxxgzrwbytepilyvuupgxahsdlcruazcoroougiqmfkvcpfszpegbjctuylpa
```

In[77]:=
```
(* 11.24 *) Table[StringJoin[FromLetterNumber[RandomInteger[25, 5] + 1]], 100]
```

Out[77]=
```
{eblfg, anhaw, lsiad, lmpvk, xalsb, rwovk, talrp, iaqgd, zewzf, achyo, fvlkk, sjnwp,
 nolya, hxoxu, xqeem, jbdoo, gwbdp, mjwae, cdzef, zwdnr, quqqj, gusig, kixdf,
 bouxc, uecyp, kuxxy, eisvn, sdawz, jskdx, zjerh, umqxm, yinhk, uplxh, garhg,
 tvaou, jlppz, rwvag, cbrcx, gftxa, ahupx, ezmfj, vuxtz, lvyrh, klgup, chcnc,
 uculz, gmrwm, qqvhw, ktnqs, ynpxu, cqctt, afkff, tbqbb, tcotq, suius, tnqhx,
 szkov, tlems, jypuk, qyepq, sibpr, ntjse, cjxdu, fyyfb, oioyd, tgrgi, finhv,
 gzvpj, ctqdf, jbgme, sdpak, vqpwu, apqjl, xcezb, pyzsa, bavju, czjda, bwfij,
 ioffz, nortx, gztou, pbvul, tplfw, qtkpg, xuyjg, sumnq, zygxu, nfjvs, pwgar,
 csdye, wnjfz, gwswb, zjqyg, tjarn, oiwun, ntajt, pkxrs, zkyoe, izvzb, azllp}
```

In[79]:=
```
(* 11.25 *) Transliterate["wolfram", "Greek"]
```

Out[79]=
```
βολφραμ
```

In[90]:=
```
(* 11.26 *)StringJoin[
 Table[{ gray wolf SPECIES SPECIFICATION [ emoji ], sheep SPECIES SPECIFICATION [ emoji ][[2]]}, 10]]
```

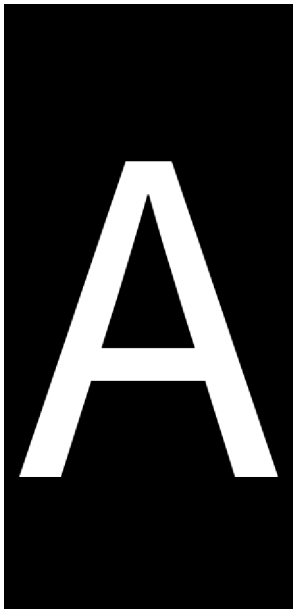
Out[90]=


In[89]:=
```
(* 11.27*) Transliterate[Alphabet["Arabic"]]
```

Out[89]=
```
{a, b, t, th, j, h, kh, d, dh, r, z, s, sh, s, d, t, z, ʿ, gh, f, q, k, l, m, n, h, w, y}
```

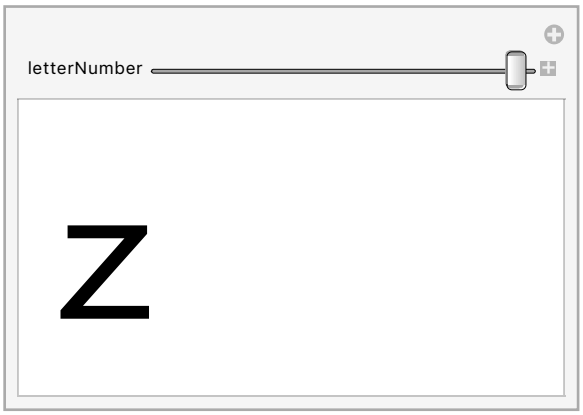
```
(* 11.28 *) ColorNegate[Rasterize[Style["A", 200]]]
```

Out[93]=



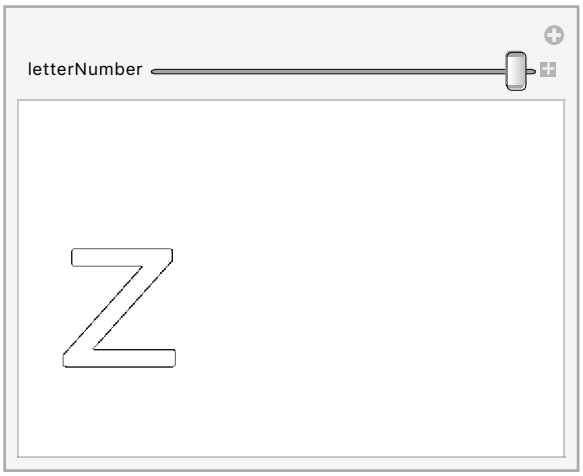

```
(* 11.29 *)
Manipulate[Style[FromLetterNumber[letterNumber], 100], {letterNumber, 1, 26, 1}]
```

Out[96]=



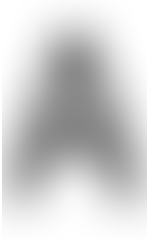
In[98]:=
```
(* 11.30 *) Manipulate[
 ColorNegate[EdgeDetect[Rasterize[Style[FromLetterNumber[letterNumber], 100]]]],
 {letterNumber, 1, 26, 1}]
```

Out[98]=



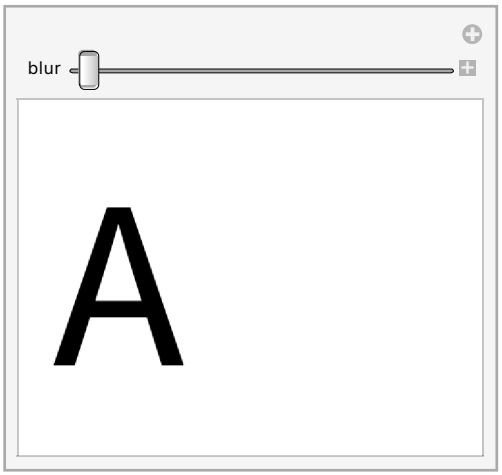
In[101]:=
```
Blur[Rasterize[Style["A", 100]], 50]
```

Out[101]=



In[102]:=
```
(* 11.31 *) Manipulate[Blur[Rasterize[Style["A", 100]], blur], {blur, 0, 50}]
```

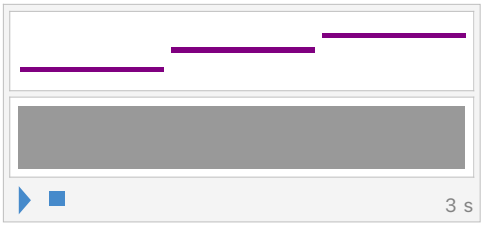
Out[102]=



Exercises from *EIWL3* Section 12

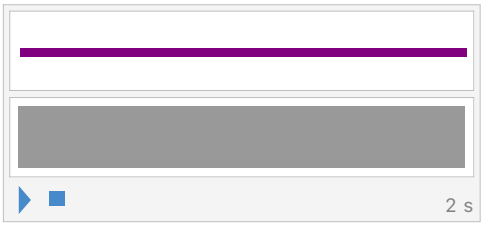
In[105]:=
```
(* 12.1 *)Sound[ Table[SoundNote[n], {n, {0, 4, 7}}]]
```

Out[105]=



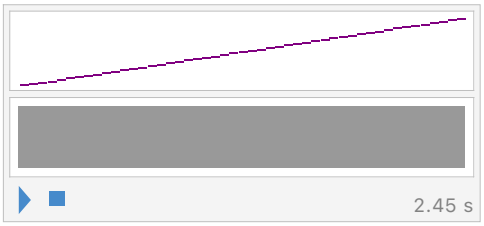
In[109]:=
```
(* 12.2 *)Sound[SoundNote["A", 2]]
```

Out[109]=



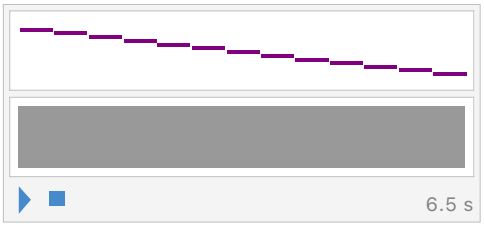

```
(* 12.3 *)Sound[Table[SoundNote[pitch, 0.05], {pitch, 0, 48}]]
```

Out[111]=



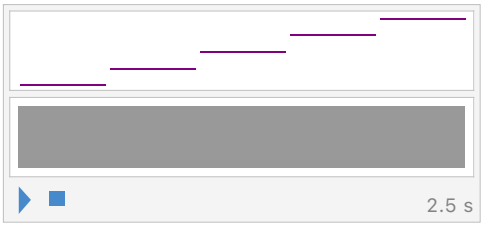
In[113]:=
```
(* 12.4 *)Sound[Table[SoundNote[pitch, 0.5], {pitch, 12, 0, -1}]]
```

Out[113]=



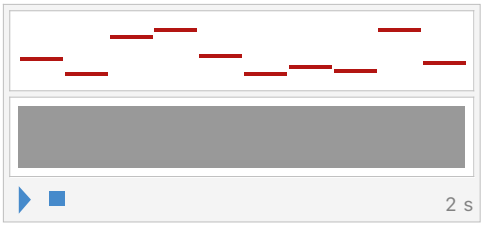
In[114]:=
```
(* 12.5 *)Sound[Table[SoundNote[12 pitch, 0.5], {pitch, 0, 4}]]
```

Out[114]=



In[122]:=
```
(* 12.6 *)Sound[Table[SoundNote[RandomInteger[12], 0.2, "Trumpet"], 10]]
```

Out[122]=



In[123]:=
```
(* 12.7 *)
Sound[Table[SoundNote[RandomInteger[12], (RandomInteger[9] + 1) / 10, "Trumpet"], 10]]
```

Out[123]=

In[124]:=
```
IntegerDigits[2^31]
```

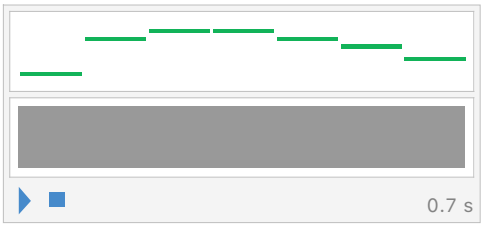
Out[124]=
```
{2, 1, 4, 7, 4, 8, 3, 6, 4, 8}
```

In[125]:=
```
(* 12.8 *)Sound[Table[SoundNote[pitch, 0.1], {pitch, IntegerDigits[2^31]}]]
```

Out[125]=

In[128]:=
```
(* 12.9 *)
Sound[Table[SoundNote[pitch, 0.1, "Guitar"], {pitch, Characters["CABBAGE"]}]]
```

Out[128]=



In[129]:=
```
(* 12.10 *)
Sound[Table[SoundNote[n, 0.1], {n, LetterNumber[Characters["wolfram"]]}]]
```

Out[129]=

Exercises from *EIWL3* Section 13

In[134]:=
```
(* 13.1 *) Grid[Table[x y, {x, 1, 12}, {y, 1, 12}]]
(* It is worth noting (even though this table is symmetrical),
that x is on the vertical axis. *)
```

Out[134]=

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

```
(* 13.2 *) Grid[Table[RomanNumeral[x y], {x, 1, 5}, {y, 1, 5}]]
(* Same note as above. *)
```

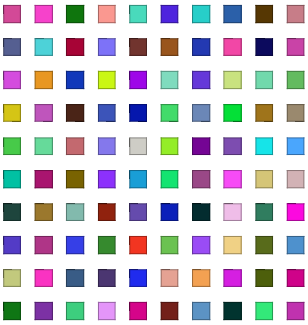
Out[135]=

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[138]:=

```
(* 13.3 *) Grid[Table[RandomColor[], 10, 10]]
(* Same note as above. *)
```

Out[138]=



```
(* 13.4 *) Grid[Table[Style[RandomInteger[10], RandomColor[]], 10, 10]]
(* Same note as above. *)
```

Out[140]=

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

In[143]:=

```
(* 13.5 *) Grid[Table[StringJoin[{a1, a2}], {a1, Alphabet[]}, {a2, Alphabet[]}]]
```

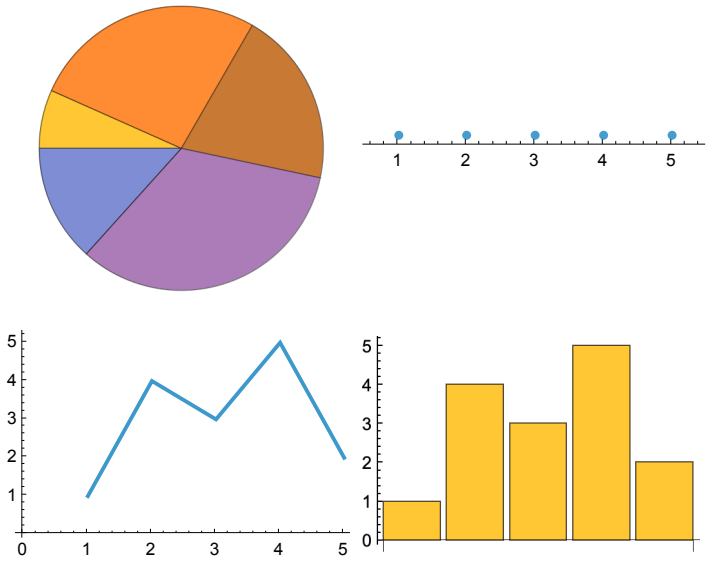
Out[143]=

```
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 wv 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[152]:=

```
(* 13.6 *)
toVisualize = {1, 4, 3, 5, 2};
Grid[{
  {PieChart[toVisualize], NumberLinePlot[toVisualize]},
  {ListLinePlot[toVisualize], BarChart[toVisualize]}
 }]
```

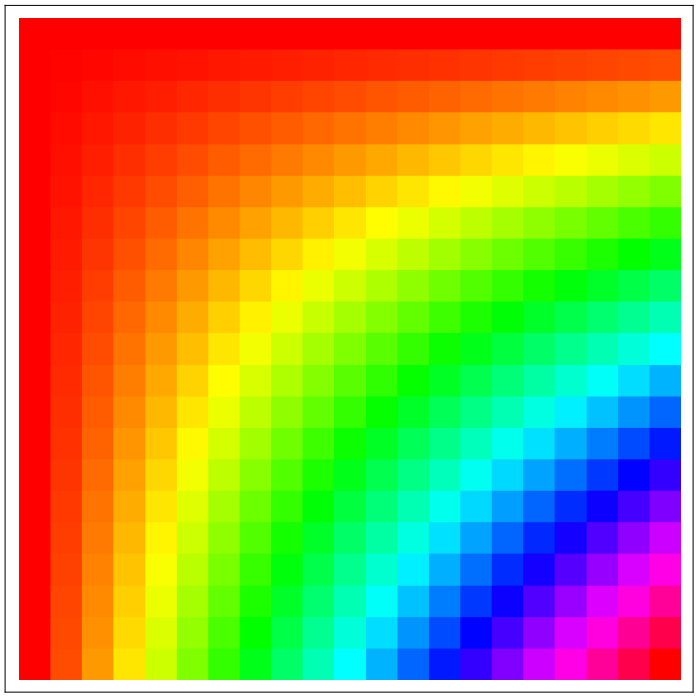
Out[153]=



In[156]:=

```
(* 13.7 *)ArrayPlot[
 Table[Hue[i j], {i, Range[0, 1, 0.05]}, {j, Range[0, 1, 0.05]}]
]
```

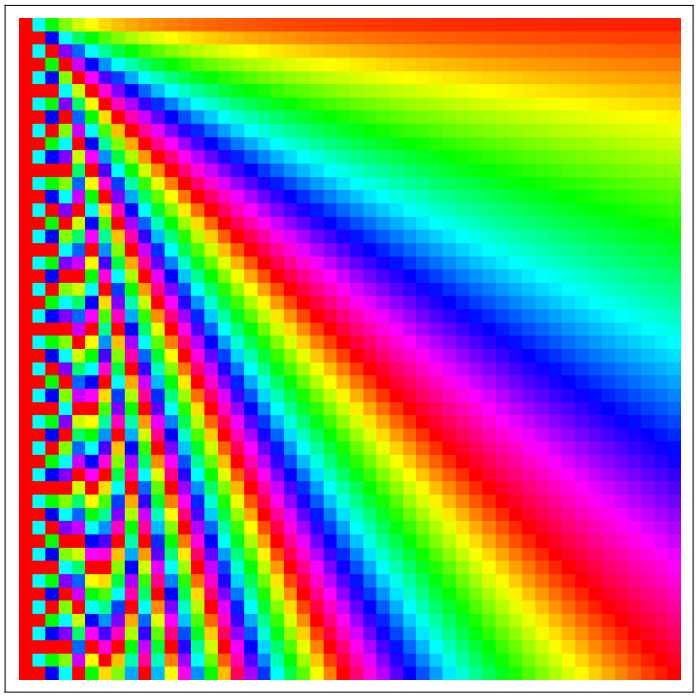
Out[156]=



In[157]:=

```
(* 13.8 *) ArrayPlot[
 Table[Hue[i / j], {i, Range[50]}, {j, Range[50]}]
]
```

Out[157]=



```
(* 13.9 *) ArrayPlot[
 Table[StringLength[RomanNumeral[i j]], {i, Range[100]}, {j, Range[100]}]
]
```

Out[162]=