EIWL Sections 47 and 48

Due to getting a little behind in the final two weeks of the semester,
I only checked for completeness on PS 18-21. ~Brian

Chapter 47

```
In[ ]:= Total[Table[x * (x + 1), {x, 1000}]]
```

```
Out[ ]=
```
334 334 000
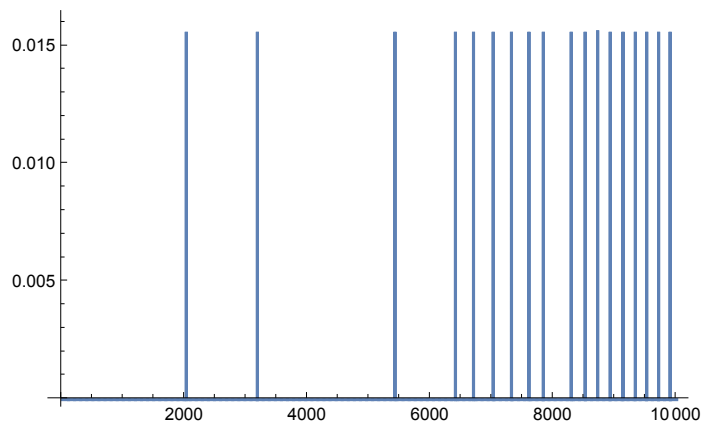
```
In[ ]:= Nest[(1 / (1 + #)) &, x, 10]
```

Out[ ]=

$$\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+x}}}}}}}}}}$$

```
In[ ]:= Flatten@Array[List, {10, 10}]
```
Out[ ]=
{1, 1, 1, 2, 1, 3, 1, 4, 1, 5, 1, 6, 1, 7, 1, 8, 1, 9, 1, 10, 2, 1, 2, 2, 2, 3, 2, 4, 2, 5, 2,
 6, 2, 7, 2, 8, 2, 9, 2, 10, 3, 1, 3, 2, 3, 3, 3, 4, 3, 5, 3, 6, 3, 7, 3, 8, 3, 9, 3, 10,
 4, 1, 4, 2, 4, 3, 4, 4, 4, 5, 4, 6, 4, 7, 4, 8, 4, 9, 4, 10, 5, 1, 5, 2, 5, 3, 5, 4, 5,
 5, 5, 6, 5, 7, 5, 8, 5, 9, 5, 10, 6, 1, 6, 2, 6, 3, 6, 4, 6, 5, 6, 6, 6, 7, 6, 8, 6, 9,
 6, 10, 7, 1, 7, 2, 7, 3, 7, 4, 7, 5, 7, 6, 7, 7, 7, 8, 7, 9, 7, 10, 8, 1, 8, 2, 8, 3,
 8, 4, 8, 5, 8, 6, 8, 7, 8, 8, 8, 9, 8, 10, 9, 1, 9, 2, 9, 3, 9, 4, 9, 5, 9, 6, 9, 7, 9,
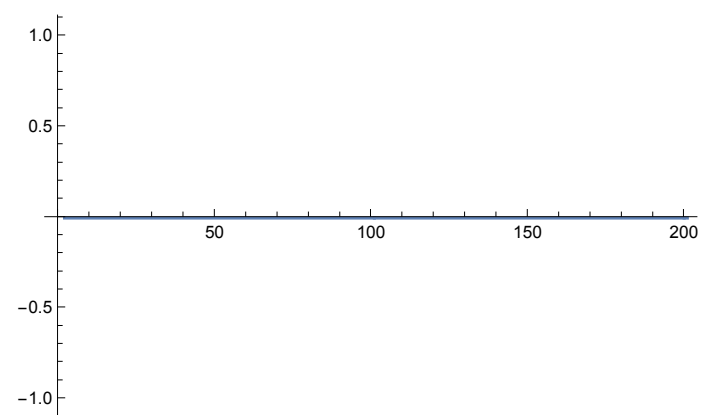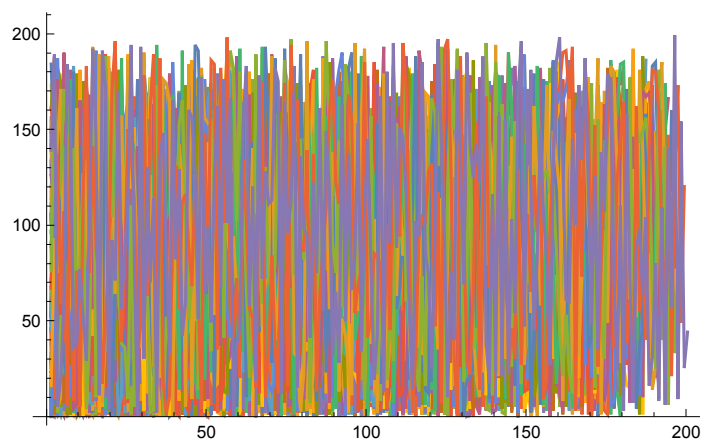 8, 9, 9, 9, 10, 10, 1, 10, 2, 10, 3, 10, 4, 10, 5, 10, 6, 10, 7, 10, 8, 10, 9, 10, 10}

In[ ]:= `ListLinePlot[Table[First[Timing[n^n]], {n, 10 000}]]`

Out[ ]=

In[ ]:= `ListLinePlot[First /@ Timing@Sort /@ Table[RandomSample[Range[n]], {n, 200}]]`

Out[ ]=

Chapter 48

In[ ]:= `Keys@Counts[If[StringLength[#] > 1, StringTake[#, 2], Nothing] & /@ WordList[]]`

Out[ ]=

{aa, ab, ac, ad, ae, af, ag, ah, ai, AI, aj, ak, al, am, an, ao, ap, Ap, aq, ar, as, AS,
 at, au, Au, av, aw, ax, ay, az, ba, BA, be, bi, bl, bo, br, bu, by, ca, ce, ch, ci,
 cl, cn, co, CO, cr, cu, cy, cz, da, dB, de, De, dh, di, DN, do, DO, dr, du, dw, dy,
 ea, eb, ec, ed, ee, e', ef, eg, eh, ei, ej, el, em, en, eo, ep, eq, er, es, et, eu,
 ev, ew, ex, ey, fa, fe, Fe, fi, fj, fl, fo, FO, fr, Fr, fu, ga, ge, gh, gi, gl, gn,
 go, Go, gr, gu, gy, ha, he, hi, HI, h', hm, ho, hu, hy, ia, ib, ic, id, if, ig, il,
 im, in, io, ip, IQ, ir, is, it, iv, ja, Ja, je, ji, jo, ju, Ju, ka, kc, ke, kh, kH,
 ki, kl, kn, ko, kp, kr, ku, kv, kW, la, le, li, ll, lo, lu, ly, ma, Ma, me, mi, mn,
 mo, Mo, ms, mu, my, na, ne, ni, no, No, nt, nu, ny, oa, ob, oc, o', Oc, od, oe,
 of, og, oh, oi, ok, ol, om, on, oo, op, or, os, ot, ou, ov, ow, ox, oy, oz, pa,
 pe, pf, pH, ph, pi, pl, pn, po, pr, ps, pt, pu, py, qu, ra, re, rh, ri, ro, ru,
 ry, sa, Sa, sc, se, Se, sh, si, sk, sl, sm, sn, so, sp, sq, st, su, Su, sv, sw,
 sy, ta, te, th, Th, ti, TN, to, tr, ts, tu, Tu, TV, tw, ty, ub, ud, UF, ug, uk,
 ul, um, un, UN, up, ur, us, ut, uv, ux, va, ve, vi, VI, vo, vu, wa, we, We, wh,
 wi, wo, wr, xe, xi, xy, ya, ye, yi, yo, yt, yu, za, ze, zi, zl, zo, zu, zw, zy}

In[ ]:= `Last@Reap@Fold[10 Sow[#1] + #2 &, {1, 2, 3, 4, 5}]`

Out[ ]=

{{1, 12, 123, 1234}}

In[ ]:= `Last@Reap@Nest[If[EvenQ[#], Sow[#] / 2, 3 # + 1] &, 1000, 20]`

Out[ ]=

{{1000, 500, 250, 376, 188, 94, 142, 214, 322, 484, 242, 364, 182}}