

```

1 local b4={}; for k,_ in pairs(_ENV) do b4[k]=k end
2 local class = require"class"
3
4 local r = math.random
5 local fmt=string.format
6 local function per(a,p) return a[1+(p or .5)*#a)//1] end
7 local function sort(t,f) table.sort(t,f); return t end
8
9 local Obj=class("Obj")
10
11 function Obj:show( t)
12     t={}
13     for k,v in pairs(self) do if tostring(k):sub(1,1)~="_" then t[1+#t]=k end end
14     return sort(t) end
15
16 function Obj:_tostring( u)
17     u={}; for _,k in pairs(self:show()) do u[1+#u] = fmt("%s%s",k,self[k]) end
18     return self._is .. "["..table.concat(u," " .. "]" end
19
20 local Col = class("Col", Obj)
21 function Col:new(at,name)
22     self.n = 0
23     self.at = at or 0
24     self.name = name or "" end
25
26 function Col:adds(t)
27     for _,v in pairs(t) do self:add(v) end; return self end
28
29 function Col:add(x,inc)
30     if x ~= "?" then inc=inc or 1; self.n = self.n + inc; self:add1(x,inc) end
31     return x end
32
33 function Col:merged(other, out)
34     out = self:merge(other)
35     if out:div()*0.95 <= (self.n*self:div() + other.n*other:div())/out.n then
36         return out end end
37
38 ---
39 ---      |  |  |  |
40
41 local Num = class("Num", Col)
42 function Num:new(at,name)
43     self:super(at,name)
44     self.w = self.name:find"-" and -1 or 1
45     self.ok, self.has = true, {}
46     self.max= 64
47     self.lo,self.hi = math.huge,-math.huge end
48
49 function Num:add1(x,inc)
50     self.hi = math.max(x, self.hi)
51     self.lo = math.min(x, self.lo)
52     local a = self.has
53     if #a < self.max then self.ok=false; a[1+#a] =x
54     elseif r() < self.max/self.n then self.ok=false; a[1+(r()*#a)//1] =x end end
55
56 function Num:all()
57     if not self.ok then self.ok=true; table.sort(self.has) end
58     return self.has end
59
60 function Num:mid() return per(self:all(), .5) end
61 function Num:div( a) a=self:has(); return (per(a,.9) - per(a,.1))/2.54 end
62
63 function Num:same(x,y) return math.abs(x-y) <= self:div()*0.35 end
64
65 function Num:merge(other, out)
66     out = Num(self.at, self.name)
67     for _,n in pairs(self.has) do out:add(n) end
68     for _,n in pairs(other.has) do out:add(n) end
69     return out end
70
71 ---
72 ---      5  \  |  |
73 ---
74
75 local Sym = class("Sym", Col)
76 function Sym:new(at,name)
77     self:super(at,name)
78     self.has = {}
79     self.mode,self.most = nil,0 end
80
81 function Sym:add1(x,inc)
82     self.has[x] = (self.has[x] or 0) + inc
83     if self.has[x] > self.most then
84         self.most, self.mode = self.has[x], x end end
85
86 function Sym:mid() return self.mode end
87 function Sym:div( e,p)
88     e=0; for _,v in pairs(self.has) do p=v/self.n; e = e - p*math.log(p,2) end
89     return e end
90
91 function Sym:merge(other, out)
92     out = Sym(self.at, self.name)
93     for x,n in pairs(self.has) do out:add(x,n) end
94     for x,n in pairs(other.has) do out:add(x,n) end
95     return out end
96
97 print(Sym(23,"thing"):adds{"a","a","b"})
98 local n = Num(23,"thing")
99 for i=1,1000 do n:add(i) end
100
101 for i,x in pairs(n:all()) do io.write(x," ") end
102
103 for k,v in pairs(_ENV) do if not b4[k] then print("?",k,type(v)) end end

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