4.daphne

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In [11]:
            from daphne import daphne
            import os, json
            import numpy as np
            import torch
            from torch import tensor
            import pandas as pd
            import matplotlib.pyplot as plt
In [34]:
            def ast helper(fname, directory):
                sugared fname = '../prob prog/hw/hw6/CS532-HW6/{}/{}'.format(directory,fname)
                desugared ast json fname = '/Users/gw/repos/prob_prog/' + sugared_fname.replace('.daphne','.json')
                if os.path.isfile(desugared ast json fname):
                     with open(desugared_ast_json_fname) as f:
                          ast = json.load(f)
                     #note: the sugared path that goes into daphne desugar should be with respect to the daphne path!
                     ast = daphne(['desugar-hoppl-cps', '-i', sugared fname])
                     with open (desugared ast json fname, 'w') as f:
                          json.dump(ast, f)
                return ast
            fname = '{}.daphne'.format(i)
            exp = ast helper(fname, directory='programs')
            %cat programs/4.daphne
           (let [mu (sample (normal 1 (sqrt 5)))
                        sigma (sqrt 2)
                        lik (normal mu sigma)]
                   (observe lik 8)
                   (observe lik 9)
                   mu)
In [35]:
            import smc
            import importlib
            importlib.reload(smc)
           <module 'smc' from '/Users/gw/repos/prob_prog/hw/hw6/CS532-HW6/smc.py'>
Out[35]:
In [45]:
            particle counts = [1,10,100,1000,10000,100000]
            fig, axes = plt.subplots(nrows=len(particle counts), figsize=(30,20))
            # fig.tight layout()
            plt.subplots adjust(left=None, bottom=None, right=None, top=None, wspace=None, hspace=0.5) # https://stackoveri
            for idx, n particles in enumerate(particle counts):
                logZ, particles = smc.SMC(n particles, exp)
                samples array = np.array([sample.item() for sample in particles])
                mean = samples array.mean()
                var = samples array.var()
                pd.Series(samples_array).plot.hist(ax=axes[idx], bins=50, title='Program {} | {} particles | mean {:1.3f}
           In SMC step 0, Zs: []
           In SMC step 1, Zs: [-5.426987590543291]
           In SMC step 2, Zs: [-5.426987590543291, -7.7169570978697495]
           In SMC step 0, Zs: []
           In SMC step 1, Zs: [-4.409021968208568]
           In SMC step 2, Zs: [-4.409021968208568, -3.281747838494585]
           In SMC step 0, Zs: []
           In SMC step 1, Zs: [-5.44325713520603]
           In SMC step 2, Zs: [-5.44325713520603, -2.7813596798573204]
           In SMC step 0, Zs: []
           In SMC step 1, Zs: [-5.348063793569588]
           In SMC step 2, Zs: [-5.348063793569588, -3.34402504427412]
           In SMC step 0, Zs: []
           In SMC step 1, Zs: [-5.384503472706044]
           In SMC step 2, Zs: [-5.384503472706044, -2.8596724029796277]
           In SMC step 0, Zs: []
           In SMC step 1, Zs: [-5.406247981671558]
           In SMC step 2, Zs: [-5.406247981671558, -2.857562885985456]
                                                  Program 4.daphne | 1 particles | mean 3.920 | var / std 0.000e+00 / 0.000e+00 | Evidence: logZ -13.144 / Z 1.957e-06
           Frequency
0.4
                                                   Program 4.daphne | 10 particles | mean 6.160 | var / std 0.000e+00 / 0.000e+00 | Evidence: logZ -7.691 / Z 4.570e-04
                                                   Program 4.daphne | 100 particles | mean 6.865 | var / std 1.919e-01 / 4.380e-01 | Evidence: logZ -8.225 / Z 2.680e-04
                                                  Program 4.daphne | 1000 particles | mean 6.497 | var / std 2.420e-01 / 4.919e-01 | Evidence: logZ -8.692 / Z 1.679e-04
           텔 150
                                                  Program 4.daphne | 10000 particles | mean 7.209 | var / std 8.558e-01 / 9.251e-01 | Evidence: logZ -8.244 / Z 2.628e-04
                                                  Program 4.daphne | 100000 particles | mean 7.225 | var / std 7.930e-01 / 8.905e-01 | Evidence: logZ -8.264 / Z 2.577e-04
           들 4000
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