bats_pyrho

Installing pyrho

Hu et al. predicted 3.75 cm/Mb recombination rate for black flying fox using pyrho

```
module load mamba

mamba create -n pyrho pip openssl python==3.12.0
mamba activate pyrho

# first ldpop
git clone https://github.com/popgenmethods/ldpop.git software/ldpop
#use pip from container!
/u/home/e/eewade/.conda/envs/pyrho/bin/pip install software/ldpop/

# then cython
/u/home/e/eewade/.conda/envs/pyrho/bin/pip install cython

# also msprime if not already
/u/home/e/eewade/.conda/envs/pyrho/bin/pip install msprime

# finally pyrho
git clone https://github.com/popgenmethods/pyrho.git software/pyrho
/u/home/e/eewade/.conda/envs/pyrho/bin/pip install software/pyrho/

# MIGHT WANT TO: if not in path warning happens
export PATH=$PATH:/u/home/e/eewade/.local/bin

# check it works
python -m pytest pyrho/tests/tests.py
```

Actually the version conflicts were being annoying af so I’m using docker

```
module load apptainer
apptainer pull software/pyrho.sif docker://thehung92phuyen/pyrho
# make sure it works
apptainer shell software/pyrho.sif
#once in
source /opt/conda/etc/profile.d/conda.sh
conda activate pyrho
conda install anaconda::pytest
python -m pytest pyrho/tests/tests.py
```

Step 1: Make lookup table

```
#!/bin/bash
#$ -cwd
# error = Merged with joblog
#$ -e /u/scratch/e/eewade/logs/bats_make_table.eo
#$ -o /u/scratch/e/eewade/logs/bats_make_table.eo
#$ -j y
## Edit the line below as needed:
#$ -l h_data=10G,h_rt=23:59:00
## Modify the parallel environment
## and the number of cores as needed:
#$ -pe shared 6
# Email address to notify
#$ -M eew226@g.ucla.edu
# Notify when
#$ -m bea

# load the job environment:
. /u/local/Modules/default/init/modules.sh
## Edit the line below as needed:
module load mamba

mamba activate pyrho

pyrho make_table  \
--samplesize 21   \
--numthreads 6  \
--approx \
--moran_pop_size 130  \
--mu 2.388e-9 \
--outfile /u/scratch/e/eewade/pyrho/bats_pyrho_testing_lookupfile  \
--popsizes 100,100  \
--epochtimes 50
```

which indicates that we should compute a lookup table for a sample of size , from a population where at present the size is , at generations in the past the size was and so on, with a per-generation mutation rate The –numthreads option tells pyrho to use processors when computing the lookup table. Finally, –approx with –moran_pop_size tells pyrho to compute an approximate lookup table for a larger sample size and then downsample to a table for size . In general should be about 25-50% larger than . Without using the –approx flag, pyrho can compute lookup tables for < ~50, whereas with the –approx flag, pyrho can handle sample sizes in the hundreds (e.g., = 200, = 256) with little loss in accuracy as long as << .

Script resources: Job 6252711 (pyrho_script.sh) Complete

User = eewade Queue = pod_smp.q@n7429 (mailto:pod_smp.q@n7429) Host = n7429.hoffman2.idre.ucla.edu Start Time = 11/21/2024 16:21:39.600 End Time = 11/21/2024 17:36:44.446 User Time = 07:13:27 System Time = 00:01:42 Wallclock Time = 01:15:04 CPU = 07:15:10 Max vmem = 11.253G Max rss = NA Exit Status = 0

```
#!/bin/bash
#$ -cwd
# error = Merged with joblog
#$ -e /u/scratch/e/eewade/logs/bats_make_table.eo
#$ -o /u/scratch/e/eewade/logs/bats_make_table.eo
#$ -j y
## Edit the line below as needed:
#$ -l h_data=10G,h_rt=23:59:00
# Email address to notify
#$ -M eew226@g.ucla.edu
# Notify when
#$ -m bea

# load the job environment:
. /u/local/Modules/default/init/modules.sh
## Edit the line below as needed:
module load mamba

mamba activate pyrho

/u/home/e/eewade/.local/bin/pyrho hyperparam --samplesize 21 --tablefile /u/scratch/e/eewade/pyrho/bats_pyrho_tes
ting_lookupfile \
--mu 2.388e-9  --ploidy 2 \
--popsizes 100,100  \
--epochtimes 50  \
--outfile /u/scratch/e/eewade/pyrho/bats_pyrho_testing_hyperparam
```