

- Repeat forever
  - Initialize  $w \leftarrow 1$
  - Execute program  $\mathcal{P}$ .
  - While executing  $\mathcal{P}$  if a sample, observe, or predict is reached do:
    - \* sample:  $\mathcal{P}$  passes us a continuation  $k$  and an object  $(f, \theta)$  consisting of a distribution  $f$  with parameter  $\theta$ . We sample a value  $x \sim f(\cdot|\theta)$  then call  $(k \ x)$ .
    - \* observe:  $\mathcal{P}$  passes us a continuation  $k$ , an object  $(g, \phi)$  consisting of a distribution  $g$  with parameter  $\phi$ , and a observed value  $y$ . We compute  $w \leftarrow wg(y|\phi)$  and call  $(k)$ .
    - \* predict:  $\mathcal{P}$  passes us a continuation  $k$ , a label  $\ell$ , and a value  $z$ . We store  $(\ell, z)$  and call  $(k)$ .
  - When  $\mathcal{P}$  terminates we “output” all stored predicts  $(\ell, z)$  and the likelihood weight  $w$ .