monte carlo integration : Rejection

Nikki Rider
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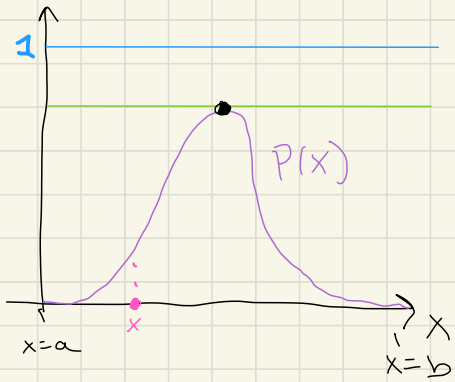
Rejection sampling



$cQ(x) > P(x)$

$c = \max(P/Q)$

$= \max(P)/Q$

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mci_reject.py normal uniform 1000
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P(x) Q(x) R

steps to generate support points:

- generate Random numbers (x, u)
  where $x \in [a, b]$

  $u \in [0, 1]$
- if $u \leq P(x)/cQ(x)$

  keep x as one of our support points $\{x_i\}$
- Repeat, stop when we have R successful tries

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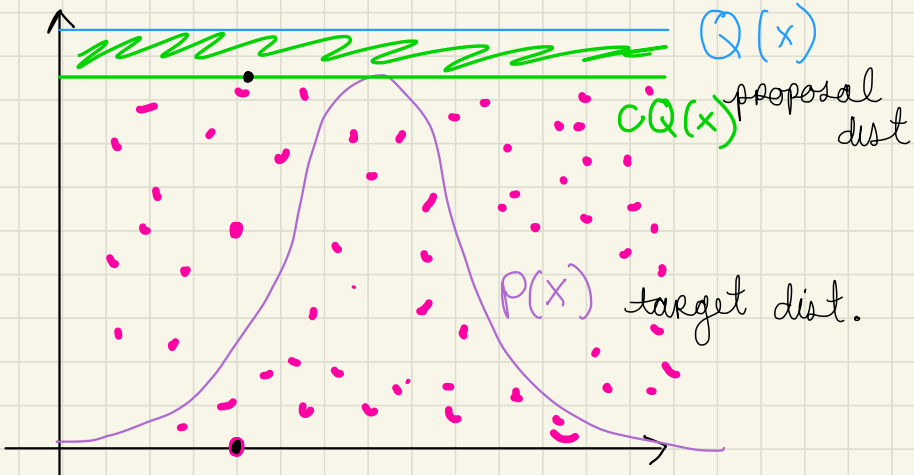
this is the same as generating a Random x-value in our domain and a Random y-value below $cQ(x)$. (like darts)

$$u\,cQ(x) \leq P(x)$$

Random # between $[0, cQ(x)]$



x =

u = np.random.rand(1)

y = u * c * Q(x)

$y \in [0, c * Q(x)]$

$u \in [0, 1]$