Q3

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Valuing American Options by Simulation: A Simple Least-Squares Approach

```
vol1 = 0.5
vol2 = 0.4
s01 = 100
s02 = 150
q1 = 0
q2 = 0.03
t = 1
r = 0.01
rho = 0.1
k = 250

sd1 = vol1 * sqrt(t)
sd2 = vol2 * sqrt(t)
mu1 = log(s01) + (r - q1 - 0.5 * sd1**2) * t
mu2 = log(s02) + (r - q2 - 0.5 * sd2**2) * t

a = exp(mu1 + 0.5 * sd1**2) + exp(mu2 + 0.5 * sd2**2)
b = exp(2*mu1 + 2*sd1**2) + exp(2*mu2 + 2*sd2**2) + 2*exp(mu1+mu2+0.5*(sd1**2 + sd2**2 + 2*rho*sd1*sd2))

mu = log((a**2)/sqrt(b))
var = log(b/(a**2))

mu
```

```
## [1] 5.457878
```

```
var
```

```
## [1] 0.1113821
```