In All Likelihood - Wuji Shan

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Using R, prepare answers to exercises 4.25, 4.39, and 4.27.

Exercise 4.25

```
f <- function(x, mu = 0, sigma = 1) dunif(x, mu, sigma)
F <- function(x, mu = 0, sigma = 1) punif(x, mu, sigma, lower.tail = FALSE)

integrand <- function(x, r, n){
  x * (1 - F(x))^(r - 1) * F(x)^(n - r) * f(x)
}

E <- function(r, n){
  (1/beta(r, n - r + 1)) * integrate(integrand, -Inf, Inf, r, n)$value
}

medianprrox <- function(k, n){
  m <- (k - 1/3) / (n + 1/3)
  return(m)
}
```

```
E(2.5, 5)
```

```
## [1] 0.4166667
```

```
medianprrox(2.5, 5)
```

```
## [1] 0.40625
```

```
E(5, 10)
```

```
## [1] 0.4545455
```

```
medianprrox(5, 10)
```

```
## [1] 0.4516129
```