Ex

1. (a) 写一个名为directpoly()的函数, 用来计算如下多项式的值

$$P(x) = c_n x^{n-1} + c_{n-1} x^{n-2} + \cdots + c_2 x + c_1.$$

其变量为x和多项式的系数. 确保该函数可以对向量x返回一个向量, 其值由多项式函数在x各分量处的值构成.

Ex

(b) 对比较大的n, 可以通过如下更有效率的算法(Horner's Rule)计算多项式在x处的值

1) 令$a_n \leftarrow c_n$.
2) 对$i = n-1, \cdots, 1$, 令$a_i = a_{i+1}x + c_i$.
3) 返回a_1. (此即为计算的$P(x)$ 值.)

写一个名为hornerpoly()的函数实现如上算法, 其变量为x和多项式的系数. 并注意当x是一个向量时, 确认hornerpoly()函数会返回一个向量.

(c) 对如上两个函数的执行时间进行比较.

Ex

2. 自己编写一个函数, 求数据$y = (y_1, y_2, \ldots, y_n)$的均值、标准差、偏度与峰度.

3. Write an R function that does the following:

(a) Accepts the argument: a vector

(b) Checks whether the vector is numeric

(c) if not, displays the message "Vector must be number" and exits

(d) if yes, computes the skewness of the values (after removing any missing values)

Ex

i. if the absolute value of skewness is less than 1, returns a list containing two objects:
   A. skewness in an object named "skewness"
   B. a vector consisting of the mean and standard deviation in an object named "descstats"

ii. otherwise, returns a list containing two objects
   A. skewness in an object named "skewness"
   B. a vector consisting of the five-number summary in an object named "descstats"

Ex

4. Run your function in R three times, using the following vectors as arguments:

(a) c("Arthur", "Mary", "Rover")

(b) rnorm(100)

(c) rexp(100,5)