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TAREA 2

Introduccion al Lenguaje de Programacion R

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1. Escriba las instrucciones en R que calcule lo siguiente:

(a) $\sum_{i=1}^{500} (2i - 1) = 1 + 3 + 5 + 7 + \dots + 999 =$

INTRUCCIONES:

```
> n <- seq(1,500,1)
```

```
> x <- ((2*n)-1)
```

```
> sum(x)
```

RESULTADO: 250,000

(b) $\sum_{i=1}^{500} (-1)^{(i+1)} (2i - 1) = 1 - 3 + 5 - 7 + \dots - 999 =$

INTRUCCIONES:

```
> n <- seq(1,500,1)
```

```
> x <- ((-1)^(n+1)) * (2*n-1)
```

```
> sum(x)
```

RESULTADO: -500

(c) $\sum_{i=1}^{1000} i^2 = 1^2 + 2^2 + 3^2 + 4^2 + \dots + 1000^2 =$

INTRUCCIONES:

```
> n <- seq(1,1000,1)
```

```
> x <- (n*n)
```

```
> sum(x)
```

RESULTADO: 333,833,500

2. Dados los vectores $x = c(3; 5; 6; 4; 2; 7; 8; 9)$ y $y = c(4; 3; 2; 5; 7; 4; 3; 8)$ escribir las instrucciones en R que calcule lo siguiente:

$$(a) x = \frac{\sum_{i=1}^8 x_i}{n} = \frac{x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + x_8}{8} \quad y \quad y = \frac{\sum_{i=1}^8 y_i}{n}$$

INTRUCCIONES:

```
> x = c(3,5,6,4,2,7,8,9)
```

```
> a = sum(x)/8
```

RESULTADO: 5.5

```
> y = c(4,3,2,5,7,4,3,8)
```

```
> a = sum(x)/7
```

RESULTADO: 7

- (b) En base a las instrucciones del inciso anterior, escriba lo necesario para calcular:

$$va = \frac{\sum_{i=1}^8 (x_i - \bar{x})^2}{n - 1}$$

INTRUCCIONES:

```
> x = c(3,5,6,4,2,7,8,9)
```

```
> prom <- mean(x)
```

```
> a <- ((x[c(1)]]-prom)^2
```

```
> b <- ((x[c(2)]]-prom)^2
```

```
> c <- ((x[c(3)]]-prom)^2
```

```
> d <- ((x[c(4)]]-prom)^2
```

```
> e <- ((x[c(5)]]-prom)^2
```

```
> f <- ((x[c(6)]]-prom)^2
```

```
> g <- ((x[c(7)]]-prom)^2
```

```
> h <- ((x[c(8)]]-prom)^2
```

```
> i <- ((x[c(1)]]-prom)^2
```

```
> a <- ((x[c(1)]]-prom)^2
```

```
> va <- sum(a+b+c+d+e+f+g+h)/7
```

RESULTADO: 6

SS =		$\sum_{i=1}^8 (x_i - \bar{x})(y_i - \bar{y})$							
		$\sum_{i=1}^8 (x_i - \bar{x})^2$	$\sum_{i=1}^8 (y_i - \bar{y})^2$						
		$\sum_{i=1}^8 (x_i - \bar{x})^2$	$\sum_{i=1}^8 (y_i - \bar{y})^2$						

INTRUCCIONES:

```
> x = c(3,5,6,4,2,7,8,9)
```

```
> prom_x <- mean(x)
```

```
> y = c(4,3,2,5,7,4,3,8)
```

```
> prom_y <- mean(y)
```

```
> a <- ((x[c(1)]]-prom_x)*((y[c(1)]]-prom_y)
```

```
> b <- ((x[c(2)]]-prom_x)*((y[c(2)]]-prom_y)
```

```
> c <- ((x[c(3)]]-prom_x)*((y[c(3)]]-prom_y)
```

```
> d <- ((x[c(4)]]-prom_x)*((y[c(4)]]-prom_y)
```

```
> e <- ((x[c(5)]]-prom_x)*((y[c(5)]]-prom_y)
```

```
> f <- ((x[c(6)]]-prom_x)*((y[c(6)]]-prom_y)
```

```
> g <- ((x[c(7)]]-prom_x)*((y[c(7)]]-prom_y)
```

```

> h <- ((x[c(8)]-prom_x)*((y[c(8)]-prom_y)
> numerador <- sum(a+b+c+d+e+f+g+h)

>a1 <- (((x[c(1)])-prom_x)^2)
>a2 <- (((y[c(1)])-prom_y)^2)
>b1 <- (((x[c(2)])-prom_x)^2)
>b2 <- (((y[c(2)])-prom_y)^2)
>c1 <- (((x[c(3)])-prom_x)^2)
>c2 <- (((y[c(3)])-prom_y)^2)
>d1 <- (((x[c(4)])-prom_x)^2)
>d2 <- (((y[c(4)])-prom_y)^2)
>e1 <- (((x[c(5)])-prom_x)^2)
>e2 <- (((y[c(5)])-prom_y)^2)
>f1 <- (((x[c(6)])-prom_x)^2)
>f2 <- (((y[c(6)])-prom_y)^2)
>g1 <- (((x[c(7)])-prom_x)^2)
>g2 <- (((y[c(7)])-prom_y)^2)
>h1 <- (((x[c(8)])-prom_x)^2)
>h2 <- (((y[c(8)])-prom_y)^2)

>a3 <- sqrt(a1)*sqrt(a2)
>b3 <- sqrt(b1)*sqrt(b2)
>c3 <- sqrt(c1)*sqrt(c2)
>d3 <- sqrt(d1)*sqrt(d2)
>e3 <- sqrt(e1)*sqrt(e2)
>f3 <- sqrt(f1)*sqrt(f2)
>g3 <- sqrt(g1)*sqrt(g2)
>h3 <- sqrt(h1)*sqrt(h2)
>denominador <- sum(a3+b3+c3+d3+e3+f3+g3+h3)

>ss <- numerador/denominador

```

RESULTADO: -0.03389831

NOTA:

x1 es el primer elemento del vector x
x2 es el segundo lemento del vector x
...
x8 es el octavo elemento del vector x