**Learning Activity 3 – Arrays**

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| Activity | * Create a 4x3x2 array of 24 elements using the random values between 1 and 50 * Name the columns, rows and matrices using names of your choice * Print the array * Print the second matrix * Print the last row of the second matrix * print the second column of the first matrix * Save the above script as **Activity 2\_5\_4\_2** |

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| **Example** |
| # Naming the rows, columns and matrices  column.names <- c("Col1","Col2","Col3")  row.names <- c("Row1","Row2","Row3")  matrix.names <- c("Matrix1","Matrix2")  # Create two vectors of different lengths for array1  vector1 <- c(seq(5,21,by=2))  vector2 <- c(1,2,3)  # Inputting the vectors, dimensions and names to the array, array1  array1 <- array(c(vector1,vector2),dim = c(3,3,2),dimnames = list(row.names,column.names,matrix.names))  cat ("Array1\n")  print(array1)  # Create two vectors of different lengths for array2  vector3 <- c(11,12,13)  vector4 <- c(1,-10,5,1,3,-2,6,2,9)  # Creating array2  array2 <- array(c(vector3,vector4),dim = c(3,3,2),dimnames = list(row.names,column.names,matrix.names))  cat ("Array2\n")  print(array2)  # create matrices from the first matrix of these arrays  matrix1 <- array1[,,1]  matrix2 <- array2[,,2]  cat ("Matrix1 - 1st Matrix of Array1\n")  print(matrix1)  cat ("Matrix2 - 2nd Matrix of Array2\n")  print(matrix2)  # Subtracting the matrices to get array3  matrix3 <- matrix1 - matrix2  matrix4 <- matrix1 + matrix2  cat ("Matrix3\n")  print(matrix3)  cat ("Matrix4\n")  print(matrix4)  # Creating array3 from matrix3 and matrix4  array3 <- array(c(matrix3,matrix4),dim = c(3,3,2),dimnames = list(row.names,column.names,matrix.names))  cat ("Array3 made up from Matrix 3 and Matrix 4\n")  print(array3) |

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| Activity | * Copy and run the above example in a new R script. * Create an array, array4, with the second matrix of array1 and the first matrix of array2. * From array4, subtract array3 and save it as array5 * Print array5 which should display the following:   , , Matrix1  Col1 Col2 Col3  Row1 2 5 -5  Row2 -3 6 -16  Row3 3 7 -1  , , Matrix2  Col1 Col2 Col3  Row1 0 -21 -17  Row2 3 -35 -6  Row3 -5 -23 -28   * Save the above script as **Activity 2\_5\_4\_3** |
| Activity | * This activity continues from the previous activity. * For array5, calculate and display the: * sum of the rows across all matrices * sum of the columns across all matrices * product of the rows across all matrices * product of the columns across all matrices * mean of the columns across all matrices * the sum of the respective elements across all matrices * Save the above script as **Activity 2\_5\_4\_4** |