**Activities: Dictionaries and Sets**

The activities on this page allow you to demonstrate your ability to:

* Store, retrieve, and manipulate a data collection using a dictionary with defined index values.
* Store, retrieve, and manipulate data in a set.

**Activity 1**

Create a program that sums all the values in a dictionary and displays the sum, with a message that indicates it.

For example, if we have the following dictionary:

dictionary = {"hello": 4, "world": 4, "I": 1, "am": 2, "Martha": 3}

The program should output:

The sum of values is 14.

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| # Define the dictionary  dictionary = {"hello": 4, "world": 4, "I": 1, "am": 2, "Martha": 3}  # Calculate the sum of all values in the dictionary  total\_sum = sum(dictionary.values())  # Display the result  print("The sum of values is " + str(total\_sum) + ".") |

**Activity 2**

Write a program that displays the maximum and minimum values in a dictionary. You may use the same dictionary you used in the previous activity or create a new one.

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| # Define the dictionary  dictionary = {"hello": 4, "world": 4, "I": 1, "am": 2, "Martha": 3}  # Get the maximum and minimum values  max\_value = max(dictionary.values())  min\_value = min(dictionary.values())  # Display the results  print("The maximum value is " + str(max\_value) + ".")  print("The minimum value is " + str(min\_value) + ".") |

**Activity 3**

Write a program that returns the sum of the integer elements in a set.

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| # Define the set  number\_set = {3, 2, 4, 1, 5}  # Calculate the sum of all integer elements in the set  total\_sum = sum(number\_set)  # Display the result  print("The sum is: " + str(total\_sum)) |

**Activity 4**

Write a program that computes and displays the maximum and the minimum values in a set.

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| # Define the set  number\_set = {3, 2, 4, 1, 5}  # Find the maximum and minimum values in the set  max\_value = max(number\_set)  min\_value = min(number\_set)  # Display the results  print("The maximum value is " + str(max\_value))  print("The minimum value is " + str(min\_value)) |

**Activity 5**

Given the following dictionary storage, complete the following tasks:

* Add a key named "freezer".
* Set the value of "freezer" to be a [list](https://academy.engagelms.com/mod/page/view.php?id=185968) containing the items "ice cubes", "ice cream", and "pepperoni pizza".
* Sort the items in the cupboard using sort.
* Add "cream" to the fridge.
* Remove "sugar" from the cupboard.
* Subtract $25 from the emergency jar.

storage = {

"cupboard": ["spices", "flour", "sugar"],

"drawer": ["fork", "knife", "spoon"],

"fridge": ["butter", "milk", "cheese"],

"emergency jar": 150

}

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| # Initial dictionary  storage = {      "cupboard": ["spices", "flour", "sugar"],      "drawer": ["fork", "knife", "spoon"],      "fridge": ["butter", "milk", "cheese"],      "emergency jar": 150  }  # Add a key named "freezer" with specified list as value  storage["freezer"] = ["ice cubes", "ice cream", "pepperoni pizza"]  # Sort the items in the cupboard  storage["cupboard"].sort()  # Add "cream" to the fridge  storage["fridge"].append("cream")  # Remove "sugar" from the cupboard  storage["cupboard"].remove("sugar")  # Subtract $25 from the emergency jar  storage["emergency jar"] -= 25  # Print the updated storage dictionary  print(storage) |

**Activity 6**

Create a new dictionary named shopping\_list and add the following items to the dictionary:

"milk" : 4,

"butter" : 2,

"crackers" : 1.5,

"rice" : 2.25,

"spaghetti" : 1.75,

"dish soap": 3.25

Loop through each item in the [list](https://academy.engagelms.com/mod/page/view.php?id=185968) and print out each key with its price. Print the answer in this format:

milk

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price: 4

butter

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price: 2

Next, calculate how much it will cost if you purchase all the items on the [list](https://academy.engagelms.com/mod/page/view.php?id=185968).

* Use a variable named total\_cost to store the calculated value.
* Loop through the dictionary and add the price of each item to the total cost.
* After looping through the dictionary, print out the total cost in a message that is meaningful to the user.

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| # Create the shopping\_list dictionary  shopping\_list = {      "milk": 4,      "butter": 2,      "crackers": 1.5,      "rice": 2.25,      "spaghetti": 1.75,      "dish soap": 3.25  }  # Loop through each item in the list and print out each key with its price  for item, price in shopping\_list.items():      print(item)      print("-" \* len(item))      print("price:", price)      print()  # Blank line for better readability  # Calculate the total cost  total\_cost = 0  for price in shopping\_list.values():      total\_cost += price  # Print out the total cost  print("The total cost of all the items on the shopping list is $" + str(total\_cost) + ".") |

**Activity 7**

Create two dictionaries: price and quantity.

* The price dictionary should be the same as the shopping\_list dictionary in the previous activity:
* "milk" : 4,
* "butter" : 2,
* "crackers" : 1.5,
* "rice" : 2.25,
* "spaghetti" : 1.75,

"dish soap": 3.25

* The quantity dictionary should have the same keys, but with values that represent the number of items to purchase rather than the price:
* "milk" : 1,
* "butter" : 1,
* "crackers" : 3,
* "rice" : 2,
* "spaghetti" : 5,

"dish soap": 1

Write a script that loops through both dictionaries to calculate the total cost if we purchase the indicated quantity of each item in the [dictionaries.](https://academy.engagelms.com/mod/book/view.php?id=185666)

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| # Define the price dictionary  price = {      "milk": 4,      "butter": 2,      "crackers": 1.5,      "rice": 2.25,      "spaghetti": 1.75,      "dish soap": 3.25  }  # Define the quantity dictionary  quantity = {      "milk": 1,      "butter": 1,      "crackers": 3,      "rice": 2,      "spaghetti": 5,      "dish soap": 1  }  # Calculate the total cost based on the quantities specified  total\_cost = 0  for item in price:      item\_price = price[item]      item\_quantity = quantity[item]      total\_cost += item\_price \* item\_quantity  # Print out the total cost  print("The total cost of purchasing the items with the specified quantities is $" + str(total\_cost) + ".") |

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Top of Form