1 Python While Loop

A while loop in Python iterates through a block of code as long as a specified condition remains true. It is used when we need to repeatedly execute code based on changing conditions, offering a flexible way to control program flow.

[3]:
```python
# Example 01 :
            #  Printing numbers as long as they are less than 50 using a while
    loop

# Initialize a counter variable
number = 1

# Continue looping as long as the number is less than or equal to 50
while number <= 50 :

    # print the number
    print(number)

    # Increment the current number by 1 in each iteration
    number +=1
```

```
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
```

```
17
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41
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44
45
46
47
48
49
50
```

[2]:
```python
# Example 02 :
            # Summing numbers from 1 to 10 using while loop

# Initialize a variable to store the running total
sum_of_numbers = 0

# Start with the first number
current_number = 1

# Continue adding numbers to the total as long as the current number is less␣
 ↳than or equal to 10
while current_number <= 10 :
```

```python
        # Add the current number to the running total
        sum_of_numbers = sum_of_numbers + current_number

        # Increment the current number by 1 in each iteration
        current_number += 1

# Print the final sum
print(f"The sum of numbers is {sum_of_numbers}")
```

The sum of numbers is 55

```python
[9]:  # Example 03 :
                    # Create a simple calculator to calculate multiples of a given
        ⸱number provided by the user using while loop

      # Initialize a starting number
      number = 1

      # Prompt the user to input the number for which they want to calculate multiples
      base_number = int(input("Please enter the number for which you want to find
        ⸱multiples : "))

      # Print a blank line for clarity
      print()

      # Print a description for clarity
      print(f"Below are the multiples of {base_number}:")

      # Continue iterating until the number is less than or equal to 20
      while number <= 20 :

          # Calculate the result by multiplying the 'base_number' by the current
        ⸱'number'
          result = base_number * number

          # Print the result in the format "base_number * current_number = result"
          print(f"{base_number} * {number} = {result}")

          # Increment the current 'number' by 1 in each iteration
          number +=1
```

Please enter the number for which you want to find multiples : 4

Below are the multiples of 4:
4 * 1 = 4
4 * 2 = 8

```
4 * 3 = 12
4 * 4 = 16
4 * 5 = 20
4 * 6 = 24
4 * 7 = 28
4 * 8 = 32
4 * 9 = 36
4 * 10 = 40
4 * 11 = 44
4 * 12 = 48
4 * 13 = 52
4 * 14 = 56
4 * 15 = 60
4 * 16 = 64
4 * 17 = 68
4 * 18 = 72
4 * 19 = 76
4 * 20 = 80
```

[6]:
```python
# Example 04 :
            # user input validation for passowrd

# Initialize an empty string for the user's password
user_password = ""

# Continue prompting for password untill it match to correct passwarsd
while user_password != "secret" :

    # Prompt the user for password
    user_password = input("Please enter user Password : ")

    # Check if the entered password is correct
    if user_password == "secret" :
        # If the condition is True, print a message indicating grant access
        print("Access granted!")

    # If the condition is False execute the else block
    else :
        # print a message indicating access deny
        print("Access denied!")
```

```
Please enter user Password : seprat
Access denied!
Please enter user Password : hang
Access denied!
Please enter user Password : pakistan
Access denied!
Please enter user Password : secret
```

Access granted!

[9]:
```python
# Example 05 :

            # Shopping Cart Program : Simulates shopping experience by
    allowing users to add items to their cart from a predefined shop list

# Create a list representing items in the shop
shop = ['mobile', 'charger', 'cable', 'hands free', 'usb', 'card reader']

# Initialize an empty list to represent the user's shopping cart
cart = []

# Continuously prompt the user to enter an item until they decide to quit
while True :

    # Prompt the user to enter an item
    item = input("Please enter the item you want to add to your cart or enter q
   to quit : ")

    # Check if the user input is not 'q', the item is available in the shop,
   and the item is not already in the cart
    if (item != 'q') and (item in shop) and (item not in cart) :
        # If all conditions are met, add the item to the cart
        cart.append(item)

    # # Check if the user input is 'q', indicating they want to quit shopping
    elif item == 'q' :
        # If the condition is True, break out of the loop
        break

    # If the above conditions is False, execute the else block
    else :
        # If the item is not available in the shop or is already in the cart,
   notify the user
        print("The item is not available in the shop or is already in the cart.
   ")

# Print a blank line for clarity
print()

# Print the contents of the cart after the user has finished shopping
print(f"Your shopping cart contains the following items : \n{cart}")
```

Please enter the item you want to add to your cart or enter **'q'** to quit : mobile
Please enter the item you want to add to your cart or enter **'q'** to quit :
charger
Please enter the item you want to add to your cart or enter **'q'** to quit : hands

5

free
Please enter the item you want to add to your cart or enter **'q'** to quit :
bluetooth
The item is not available in the shop or is already in the cart.
Please enter the item you want to add to your cart or enter **'q'** to quit : q

Your shopping cart contains the following items :
['mobile', 'charger', 'hands free']

[11]:
```python
# Example 06 :
             # Program simulates a virtual store where users can select items
  from a dictionary containing product names and their corresponding prices.
  Additionally, the program calculates the grand total of the selected items

# Define the shop collection with items listed by name as keys and their
  corresponding prices as values
new_shop ={'mobile casing':200,'mobile chargers':300,'data cable':200, 'usb':
  500,'card reader':50, 'handsfree':800, 'bluetooth':3000}

# Initialize an empty list to represent the user's shopping cart
new_cart = []

# Initialize a variable to keep track of the grand total of the items in the
  cart
grand_total = 0

# Continuously prompt the user to enter an item until they decide to quit
while True :

    # prompt the user to input an item or press 'q' to quit
    item = input("Please enter the item you want to add to your cart or press q
  to quit : ")


    # Check if the user not want to quit
    if item != 'q' :


        # If the condition is True, than check if the item is in the shop
        if item in new_shop.keys() :
            # If teh condition is True, than Prompt the user to input the
  number of units for the selected item
            units = int(input(f"How many units of {item} are required ? "))

            # Print a blank line for clarity
            print()
```

```python
            # Add the item to the shopping cart
            new_cart.append(item)

            # Calculate the total cost for the selected item based on its price
    and the number of units
            total = new_shop[item] * units


            # The calculate the grand total by updating the grand total by
    adding the total cost of the current item
            grand_total += total

        # If the condition is False execute the else block
        else :
            # If the item is not in the shop, notify the user
            print(f"{item} is not available in the shop. ")


    # If the condition is False execute the else block
    else :
        # If the user decides to quit shopping, display a thank you message and
    exit the loop
        print("Thank you for visiting ")
        break

# Print the contents of the shopping cart
print(f"\nYour shopping cart contains the following items : \n{new_cart}\n")

# Print the grand total cost of all items in the shopping cart
print(f"Grand Total : {grand_total}")
```

Please enter the item you want to add to your cart or press q to quit : mobile casing
How many units of mobile casing are required ? 3

Please enter the item you want to add to your cart or press q to quit : mobile chargers
How many units of mobile chargers are required ? 4

Please enter the item you want to add to your cart or press q to quit : handsfree
How many units of handsfree are required ? 3

Please enter the item you want to add to your cart or press q to quit : bluetooth
How many units of bluetooth are required ? 5

Please enter the item you want to add to your cart or press q to quit : q
Thank you for visiting

Your shopping cart contains the following items :
['mobile casing', 'mobile chargers', 'handsfree', 'bluetooth']

Grand Total : 19200

[10]:
```python
# Example 07 :
            # Program simulates a virtual store where users can select items
    from a dictionary containing product names and their corresponding prices.
    Additionally, the program calculates the grand total of the selected items
    and gives discount based on the grand total

# Define the shop collection with items listed by name as keys and their
    corresponding prices as values
new_shop ={'mobile casing':200,'mobile chargers':300,'data cable':200, 'usb':
    500,'card reader':50, 'handsfree':800, 'bluetooth':3000}

# Initialize an empty list to represent the user's shopping cart
new_cart = {}

# Initialize a variable to keep track of the grand total of the items in the
    cart
grand_total = 0

# Continuously prompt the user to enter an item until they decide to quit
while True :

    # prompt the user to input an item or press 'q' to quit
    item = input("Please enter the item you want to add to your cart or press q
    to quit : ")


    # Check if the user not want to quit
    if item != 'q' :


        # If the condition is True, than check if the item is in the shop
        if item in new_shop.keys() :
            # If teh condition is True, than Prompt the user to input the
    number of units for the selected item
            units = int(input(f"How many units of {item} are required ? "))

            # Print a blank line for clarity
            print()
```

```python
        # Add the item to the shopping cart
        new_cart[item] = units

        # Calculate the total cost for the selected item based on its price
and the number of units
        total = new_shop[item] * units

        # The calculate the grand total by updating the grand total by
adding the total cost of the current item
        grand_total += total


        # Apply discount based on the grand total

        # Check if the grand total is greater than or equal to 25000
        if grand_total >= 25000 :
            # If the condition is True, apply a discounof 10%
            discount = grand_total * 0.10

        # If the above condition is False, Than check that if grand total
is greater than or equal to 15000
        elif grand_total >= 15000 :
            # If the condition is True, apply a discounof 5%
            discount = grand_total * 0.05

        # If the above both condition are False, Than execute the else
block
        else :
            # If the grand total is less than 10000, no discount is applied
            discount = grand_total * 0

        # Calculate the grand total after applying the discount
        grand_total_with_discount = grand_total - discount

    # If the condition is False execute the else block
    else :
        # If the item is not in the shop, notify the user
        print(f"{item} is not available in the shop. ")


  # If the condition is False execute the else block
  else :
      # If the user decides to quit shopping, display a thank you message and
exit the loop
      print("Thank you for visiting ")
      break
```

```python
# Print a bill summary provided to the user
print("\n\033[1m=== BILL SUMMARY ===\033[0m")

# Print the contents of the shopping cart
print(f"\nYour shopping cart contains the following items and and their␣
  ␣corresponding units : \n{new_cart}\n")

# Print the grand total cost of all items in the shopping cart
print(f"Grand Total : {grand_total}\n")

# Print the calculated discount for the user's reference
print(f"Your discount : {discount}\n")

# Print the grand total after applying discount
print(f"Grand Total After Discount : {grand_total_with_discount}")
```

Please enter the item you want to add to your cart or press q to quit : mobile casing
How many units of mobile casing are required ? 13

Please enter the item you want to add to your cart or press q to quit : mobile chargers
How many units of mobile chargers are required ? 9

Please enter the item you want to add to your cart or press q to quit : usb
How many units of usb are required ? 7

Please enter the item you want to add to your cart or press q to quit : handsfree
How many units of handsfree are required ? 8

Please enter the item you want to add to your cart or press q to quit : bluetooth
How many units of bluetooth are required ? 6

Please enter the item you want to add to your cart or press q to quit : q
Thank you for visiting

=== BILL SUMMARY ===

Your shopping cart contains the following items and and their corresponding units :
{'mobile casing': 13, 'mobile chargers': 9, 'usb': 7, 'handsfree': 8, 'bluetooth': 6}

Grand Total : 33200

Your discount : 3320.0

Grand Total After Discount : 29880.0