Exercise 1:

We want to create a program that will add two numbers together and return the result. Unlike previous exercises, we will continue to ask the user for numbers until they no longer want to use our program

```
# Simple Solution


#Handling User Input Error

# declare variables
program_continue = 'Y'

# introduce the program
print('Welcome to my addition program')
print('==' * 30)

while program_continue == 'Y':
  first_number = int(input('Please enter your first number:'))
  second_number = int(input('Please enter your second number:'))
  # perform calculations
  sum_result = first_number + second_number

  # display the results
  print(f'The sum of {first_number} + {second_number} = {sum_result}')

  # change sentinel value
  while True:
    program_continue = input('Would you like to continue? Y/N:').strip().upper()
    if program_continue in ['Y', 'N']:
      break
    else:
      print('Invalid input. Please enter Y or N.')

# thank the user
print('Thank you for using the addition program.')
```

```
#Handling User Input Error

# declare variables
program_continue = 'Y'

# introduce the program
print('Welcome to my addition program')
print('==' * 30)

while program_continue == 'Y':
    while True:
        try:
            first_number = int(input('Please enter your first number:'))
            break
        except ValueError:
            first_number = int(input('Invalid input. Please enter a valid number.')

    while True:
        try:
            second_number = int(input('Please enter your second number:'))
            break
        except ValueError:
            second_number = int(input('Invalid input. Please enter a valid number.'

    # perform calculations
    sum_result = first_number + second_number

    # display the results
    print(f'The sum of {first_number} + {second_number} = {sum_result}')

    # change sentinel value
    while True:
        program_continue = input('Would you like to continue? Y/N:').strip().upper(
        if program_continue in ['Y', 'N']:
            break
        else:
            print('Invalid input. Please enter Y or N.')

# thank the user
print('Thank you for using the addition program.')
```

Exercise 2

Create a program that will count down from a specific number to 0

```
# introduce the program
print('It\'s a countdown!')
print('=='*30)

number = int(input('Please enter a number to countdown from:'))

# display the results
print(f'Counting down from {number}:')

while number > -1:
    print(number)
    number -= 1

# end of program
print('Your Program Ends here!')
```

Exercise 3

Create a countdown program that will count down to 0 from a provided minute value Display the results to the screen

```
# declare variables
second = 59

# introduce the program
print('It\'s a countdown!')
print('=='*30)

minute = int(input('Please enter a minute to countdown from:'))

# display the results
print(f'Counting down from {minute}:')
minute -= 1
while minute >=0:
    while second >=0:
        print(f'{minute}:{second}')
        second -= 1
    minute -= 1
    second = 59

# end of program
print('Blast off!')
```

Exercise 4

We want to keep track of our grocery purchases for a day. We then want to know how much we spent. Some days we may not enter anything – so it should display no amount was spent. The purchases vary from day to day

```
# Declare variables
purchases = []

# Initialize a variable
total_amount_spent = 0

# Introduce Program
print("Welcome to the Grocery Purchase Tracker!")

purchased = input("Did you purchase any grocery items today ('yes' or 'no'): ").str
```

```
# Keep prompting the user for purchases until they choose to stop
while True:

    if purchased != "yes" and purchased != 'no':
        purchased = input("Enter valid input ('yes' or 'no'): ").strip().lower()

    if purchased == 'no':
        break
    elif purchased == 'yes':
        item = input("Enter item name: ")
        while True:
            try:
                price = float(input("Enter the price of the item: $"))
                break
            except ValueError:
                price=float(input("Invalid price. Please enter a valid number."))
        purchases.append((item, price))
        total_amount_spent += price

        purchased = input("Did you purchase more grocery items today ('yes' or 'no'

        if purchased != 'yes' and purchased != 'no':
            purchased = input("Enter valid input ('yes' or 'no'): ").strip().lower(


# Display the purchases and total amount spent
if purchases:
    print("\nYour purchases for the day:")
    for item, price in purchases:
        print(f"{item}: ${price:.2f}")

    print(f"\nTotal amount spent for the day: ${total_amount_spent:.2f}")
else:
    print("\nNo purchases were made today. No amount was spent.")



for (i, s) in enumerate(range(1,5)):


  print("index",i)
  print(s)
```