Assignment 2

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CSE-15

1. Write a program that asks the user to enter a length in centimetres. If the user enters a negative length, the program should tell the user that the entry is invalid. Otherwise, the program should convert the length to inches and print out the result. 1inch = 2.54 centimetres.

In [1]:
```python
# Akash Duttachowdhury | 21052386
cm = float(input("Enter length(in cm): "))
if cm < 0:
    print(f"Negative length!!")
else:
    print(f"{cm} cm = {cm/2.54} inches")
```
```
15.0 cm = 5.905511811023622 inches
```

2. Ask the user for a temperature. Then ask them what units, Celsius or Fahrenheit, the temperature is in. Your program should convert the temperature to the other unit. The conversions are F = 9/5C + 32 and C = 5/9(F − 32).

In [2]:
```python
# Akash Duttachowdhury | 21052386
t = float(input("Enter a temperature: "))
choice = int(input("Enter 1 (for Celsius) or 2 (for Fahrenheit): "))
if choice == 1:
    print(f"{t} C = {t*9/5 + 32} F")
else:
    print(f"{t} F = {5/9*(t-32)} C")
```
```
100.0 F = 37.77777777777778 C
```

3. Ask the user to enter a temperature in Celsius. The program should print a message based on the temperature: If the temperature is less than -273.15, print that the temperature is invalid because it is below absolute zero. • If it is exactly -273.15, print that the temperature is absolute 0. • If the temperature is between- 273.15 and 0, print that the temperature is below freezing. • If it is 0, print that the temperature is at the freezing point. • If it is between 0 and 100, print that the temperature is in the normal range. • If it is 100, print that the

temperature is at the boiling point. • If it is above 100, print that the temperature is above the boiling point.

```
In [3]:  # Akash Duttachowdhury | 21052386
         temp = float(input("Enter the temperature in Celsius: "))
         if temp < -273.15:
             print("The temperature is below absolute zero")
         elif temp == -273.15:
             print("The temperature is absolute zero")
         elif temp > -273.15 and temp < 0:
             print("The temperature is below freezing point")
         elif temp >= 0 and temp < 100:
             print("The temperature is in normal range")
         elif temp==100:
             print("The temperature is at boiling point")
         else:
             print("The temperature is above the boiling point")
```

```
The temperature is above the boiling point
```

4. Write a program that asks the user how many credits they have taken. If they have taken 23 or less, print that the student is a freshman. If they have taken between 24 and 53, print that they are a sophomore. The range for juniors is 54 to 83, and for seniors it is 84 and over.

```
In [4]:  # Akash Duttachowdhury | 21052386
         no = int(input("Enter the no. of credits: "))
         if no <= 23:
             print("Freshman")
         elif no >= 24 and no <= 53:
             print("Sophomore")
         elif no >= 54 and no <= 83:
             print("Junior")
         else:
             print("Senior")
```

```
Freshman
```

5. A store charges Rs. 12 per item if you buy less than 10 items. If you buy between 10 and 99 items, the cost is Rs. 10 per item. If you buy 100 or more items, the cost is Rs. 7 per item. Write a program that asks the user how many items they are buying and prints the total cost.

```
In [5]:  # Akash Duttachowdhury | 21052386
         n = int(input("Enter the no. of items: "))
         if n < 10:
             print(f"Cost = {12*n}")
         elif n >= 10 and n < 100:
             print(f"Cost = {10*n}")
         else:
             print(f"Cost = {7*n}")
```

Cost = 330

6. Write a program that asks the user for two numbers and prints Close if the numbers are within .001 of each other and Not close otherwise.

In [6]:
```python
# Akash Duttachowdhury | 21052386
def are_close(num1, num2, tolerance=0.001):
    return abs(num1 - num2) <= tolerance

# Get user input for two numbers
num1 = float(input("Enter the first number: "))
num2 = float(input("Enter the second number: "))

# Check if the numbers are close or not
if are_close(num1, num2):
    print("Close")
else:
    print("Not close")
```

Not close

7. A year is a leap year if it is divisible by 4, except that years divisible by 100 are not leap years unless they are also divisible by 400. Write a program that asks the user for a year and prints out whether it is a leap year or not.

In [7]:
```python
# Akash Duttachowdhury | 21052386
def is_leap_year(year):
    if year % 4 == 0:
        if year % 100 == 0:
            return year % 400 == 0
        else:
            return True
    else:
        return False

year = int(input("Enter a year: "))

if is_leap_year(year):
    print(f"{year} is a leap year.")
else:
    print(f"{year} is not a leap year.")
```

2024 is a leap year.

8. Write a program that asks the user for an hour between 1 and 12, asks them to enter am or pm, and asks them how many hours into the future they want to go. Print out what the hour will be that many hours into the future, printing am or pm as appropriate. An example is shown below. Enter hour: 8 am How many hours ahead? 5 New hour: 1 pm

In [8]:
```python
# Akash Duttachowdhury | 21052386
```

```python
def calculate_future_hour(hour, period, hours_ahead):
    hour_in24 = hour + 12 if period.lower() == "pm" else hour
    future_hour_in24 = (hour_in24 + hours_ahead) % 24
    future_hour = future_hour_in24 if future_hour_in24 <= 12 else future_
    future_period = "am" if future_hour_in24 < 12 else "pm"
    print(f"Future time: {future_hour} {future_period}")


hour = int(input("Enter hour (between 1 to 12): "))
period = input("Enter 'am' or 'pm': ").lower()
hours_ahead = int(input("How many hours ahead?: "))
calculate_future_hour(hour, period, hours_ahead)
```

Future time: 1 pm

```python
    hour_in24 = hour + 12 if period.lower() == "pm" else hour
    future_hour_in24 = (hour_in24 + hours_ahead) % 24
```