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ERP: NIUINT-25-6011

CLASS: B-TECH AI/ML SECTION C

TOPIC: Temperature Converter

*Class with methods to convert Celsius to Fahrenheit and vice versa.

*Loop to allow repeated conversions.

*Conditional to validate inputs.

```
class TemperatureConverter:
    """A class to convert temperatures between Celsius and Fahrenheit."""

    def celsius_to_fahrenheit(self, celsius):
        """Converts Celsius to Fahrenheit.

        Args:
            celsius (float): Temperature in Celsius.

        Returns:
            float: Temperature in Fahrenheit.

        Raises:
            ValueError: If the temperature is below absolute zero (-
273.15 C).
        """
        if celsius < -273.15:
            raise ValueError("Temperature cannot be below absolute zero (-
273.15 °C).")
        return (celsius * 9/5) + 32

    def fahrenheit_to_celsius(self, fahrenheit):
        """Converts Fahrenheit to Celsius.

        Args:
            fahrenheit (float): Temperature in Fahrenheit.

        Returns:
            float: Temperature in Celsius.

        Raises:
            ValueError: If the temperature is below absolute zero (-
459.67 F).
        """
        if fahrenheit < -459.67:
            raise ValueError("Temperature cannot be below absolute zero (-
459.67 °F).")
```

```
        return (fahrenheit - 32) * 5/9

def main():
    converter = TemperatureConverter()

    while True:
        print("\n--- Temperature Converter ---")
        print("1. Celsius to Fahrenheit")
        print("2. Fahrenheit to Celsius")
        print("3. Exit")

        choice = input("Enter your choice (1/2/3): ")

        if choice == '1':
            try:
                c_temp = float(input("Enter temperature in Celsius: "))
                f_temp = converter.celsius_to_fahrenheit(c_temp)
                print(f"{c_temp:.2f} °C is equal to {f_temp:.2f} °F")
            except ValueError as e:
                print(f"Error: {e}")
            except Exception as e:
                print(f"An unexpected error occurred: {e}")
        elif choice == '2':
            try:
                f_temp = float(input("Enter temperature in Fahrenheit: "))
                c_temp = converter.fahrenheit_to_celsius(f_temp)
                print(f"{f_temp:.2f} °F is equal to {c_temp:.2f} °C")
            except ValueError as e:
                print(f"Error: {e}")
            except Exception as e:
                print(f"An unexpected error occurred: {e}")
        elif choice == '3':
            print("Exiting Temperature Converter. Goodbye!")
            break
        else:
            print("Invalid choice. Please enter 1, 2, or 3.")

if __name__ == "__main__":
    main()
```