Assignment - Control Flow Statements

- Conditional statements
- Loops
- Iterating items from iterable objects

1. Conditional Statements

Odd or Even

Write a program that reads **an integer** from the standard input. Your program displays a message indicating whether the integer is **even** or **odd**.

Sample Output:

```
Enter an integer: 4
Even
```

In [ ]:
```
n = int(input('Enter an integer: '))
if n%2 == 0:
    print('Even')
else:
    print('Odd')
```

Alternative:

In [ ]:
```
n = int(input('Enter an integer: '))
print('Even') if n%2 == 0 else print('Odd')
```

Human Year to Dog Year

The age of a dog could be computed as follow:

- For the first two human years, dog year is 10.5 times of human year
- For additional human year, dog year is 4 times of human year.

Implement a function `human_year_to_dog()` which converts human years to dog years

- return `None` if input is a negative value

Write a script to:

- ask user to input a human year value;
- call the function to get the equivalent dog year;

- display to the result in 1 decimal points
- display **Error** if the value is `None`

Sample Output:

```
Human Year: 2
Dog Year: 21.0
Human Year: 1.513
Dog Year: 15.9
Human Year: -2
Error
```

In [4]:
```
def human_year_to_dog(humanyear):
    if humanyear > 2:
        return 2*10.5 + (humanyear-2)*4
    elif humanyear >=0 :
        return humanyear*10.5
    else:
        return None

humanyear = float(input('Human Year: '))
dogyear = human_year_to_dog(humanyear)
if dogyear is None:
    print('Error')
else:
    print('Dog Year: {:.1f}'.format(dogyear))
```

```
Human Year: 3
Dog Year: 35.5
```

2. `while` Loop

Even Numbers Only

Create a program which ask users to input even integers. Ignore the input if the number is not even. End the program after user entered 4 even numbers and display them.

Sample Output:

```
Enter 4 even integers:
10
4
5
6
8
[10, 4, 6, 8]
```

In [ ]:
```
result = []
while True:
    val = int(input())
    if val % 2 != 0:
        continue
    result = result.append(val)
    if len(result) == 4:
        break
print(result)
```

3. for Loop

Count Even and Odd Numbers

Following code generates a list of random integers between 1 and 10 (both ends inclusive).

```
import random
nums = [random.randint(1,10) for i in range(5)]
print(nums)
```

Write a program which

- generates 10 random integers between 1 and 100;
- counts number of even and odd numbers in the list;
- displays the result as show in Sample Output.

Sample Output:

```
Random Numbers:  [18, 30, 26, 6, 83, 62, 18, 10, 32, 52]
Odd = 1, Even = 9
```

In [8]:
```
import random
nums = [random.randint(1,100) for i in range(10)]

odd = 0
even = 0
for n in nums:
    if n % 2 == 0:
        even += 1
    else:
        odd += 1

print('Random Numbers: ', nums)
print('Odd = {}, Even = {}'.format(odd, even))
```

```
Random Numbers:  [72, 86, 64, 74, 96, 100, 43, 70, 77, 75]
Odd = 3, Even = 7
```

Count Characters

Implement a function `char_freq()` which

- takes in a string
- count the frequency of all characters in the string
- return result in dictionary, where key is the character and value is the frequency

Write a program to ask user for a sentence; call the function to get character frequency; diplay the result.

Sample Output:

```
Enter a message: hello world
{'h': 1, 'e': 1, 'l': 3, 'o': 2, ' ': 1, 'w': 1, 'r': 1, 'd': 1}
```

In [11]:
```
def char_freq(sentence):
    result = {}
    for c in sentence:
        if result.get(c):
            result[c] = result[c] + 1
        else:
            result[c] = 1
    return result

s = input('Enter a message: ')
result = char_freq(s)
print(result)
```

```
Enter a message: hello world
{'h': 1, 'e': 1, 'l': 3, 'o': 2, ' ': 1, 'w': 1, 'r': 1, 'd': 1}
```