Snail and well

A snail falls at the bottom of a 125 cm well. Each day the snail rises 30 cm. But at night, while sleeping, slides 20 cm because the walls are wet. How many days does it take to escape from the well?

TIP: http://puzzles.nigelcoldwell.co.uk/sixtytwo.htm (http://puzzles.nigelcoldwell.co.uk/sixtytwo.htm)

Solución

In [3]:

```
# Assign problem data to variables with representative names
# well height, daily advance, night retreat, accumulated distance
wall_height_1 = 125
daily_advance_1 = 30
night_retreat_1 = -20


# Assign 0 to the variable that represents the solution



# Write the code that solves the problem

def calculate_days_it_takes(wall_height,daily_advance,night_retreat):
    accumulated_distance = 0
    days_it_takes = 0
    while accumulated_distance < wall_height:
        days_it_takes +=1
        accumulated_distance += daily_advance
        if accumulated_distance < wall_height:
            accumulated_distance += night_retreat
    return days_it_takes

print(calculate_days_it_takes(wall_height_1,daily_advance_1,night_retreat_1))


# Print the result with print('Days =', days)
```

```
11
```

Expected output:

```
Days = 11
```

Goals

1. Treatment of variables
2. Use of loop **while**
3. Use of conditional **if-else**
4. Print in console

Bonus

The distance traveled by the snail is now defined by a list.

```
advance_cm = [30, 21, 33, 77, 44, 45, 23, 45, 12, 34, 55]
```

How long does it take to raise the well?

What is its maximum displacement in one day? And its minimum?

What is its average speed during the day?

What is the standard deviation of its displacement during the day?

In [3]:

```
# Assign problem data to variables with representative names
# well height, daily advance, night retreat, accumulated distance
wall_height_1 = 125
daily_advance_1 = [30, 21, 33, 77, 44, 45, 23, 45, 12, 34, 55]
night_retreat_1 = -20

# Assign 0 to the variable that represents the solution



# Write the code that solves the problem

def calculate_days_it_takes(wall_height,daily_advance,night_retreat):
    accumulated_distance = 0
    days_it_takes = 0
    while accumulated_distance <= wall_height:
        days_it_takes +=1
        accumulated_distance += daily_advance[days_it_takes -1]
        if accumulated_distance <= wall_height:
            accumulated_distance += night_retreat
    return days_it_takes

days_it_takes_1 = calculate_days_it_takes(wall_height_1,daily_advance_1,night_
retreat_1)

print("Days =", days_it_takes_1)
#print("Maximum displacement =", )

maximum_displacement_1 = max(daily_advance_1[:(days_it_takes_1)])
print("Maximum displacement =", maximum_displacement_1)

mimimum_displacement_1 = min(daily_advance_1[:(days_it_takes_1)])
print("Minimum displacement =", mimimum_displacement_1)

average_progress_1 = sum(daily_advance_1) / len(daily_advance_1)
print("Average progress =", average_progress_1)



# Print the result with print('Days =', days)
```

```
Days = 6
Maximum displacement = 77
Minimum displacement = 21
Average progress = 38.09090909090909
```

Expected output:

```
Days = 6
```

In [4]:

```
# What is its maximum displacement in a day? And its minimum?
```

Expected output:

```
77 12
```

In [5]:

```
# What is its average progress?
```

Expected output:

```
38.09090909090909
```

In [10]:

```
# What is the standard deviation of your displacement during the day?

import statistics

standard_deviation = statistics.stdev(daily_advance_1)

print(standard_deviation)
```

```
17.996969441850734
```

Expected output:

```
17.159437082600803
```