Problem36

May 17, 2022

1 Problem 36

1.1 Double-base palindromes

The decimal number, $585 = 1001001001_2$ (binary), is palindromic in both bases.

Find the sum of all numbers, less than one million, which are palindromic in base 10 and base 2.

note that the palindromic number, in either base, may not include leading zeros.

[ ]:
```
def DecToBinStr(dec_num):
    bin_num = bin(dec_num)
    return str(bin_num)[2:] #remove the 0b from the start of the string

def IsPalindrome(this_string):
    for n in range(len(this_string) // 2):
        if not this_string[n] == this_string[-1-n]:
            return False
    else:
        return True

limit = 1000000
sum_of_palindromes = 0

for dec_num in range(1, limit, 2):
    if IsPalindrome(str(dec_num)):
        bin_str = DecToBinStr(dec_num)
        if IsPalindrome(bin_str):
            sum_of_palindromes += dec_num
print(sum_of_palindromes)
```

```
872187
```