```
def convert_to_base(num, base):
  return int(num, base)
def convert_to_binary(num):
  return bin(num)[2:]



# the number is being accepted
num = input('What is your number (must be a str with max len 3):')

# check if len of num is greater than 3
while len(num) > 3:
  # if num is invalid, tell user they are wrong and ask again
  print('INVALID')
  num = input('What is your number (must be a str with max len 3):')

# asking for base number
base = int(input('What is your base (must be int between 2 and 16):'))

# check if the base is greater than 16 or less than 2
while base > 16 or base < 2:
  print('INVALID')
  # if base is invalid, then tell user its invalid and prompt again
  base = int(input('What is your base (must be int between 2 and 16):'))

decimal_conversion = convert_to_base(num, base)
bin_rep = convert_to_binary(decimal_conversion)



print('{} in base {} is: {} in base {} and {} in base {}'.format(num, base,
decimal_conversion, base, bin_rep, base))
```