1. Write a function to check whether a number falls in a given range

Ans : def check_number_in_range(number, range_start, range_end):

```
    if range_start <= number <= range_end:
        return True
    else:
        return False
```

2. Some board games require you to reduce the number of cards you are holding by half, rounded down. For instance, if you have 10 cards, you would reduce to 5 and if you had 11 cards you would also reduce to 5. With 12 cards you would reduce to 6. Write a program that asks the user to enter how many cards they have and print out what their hand would reduce to under this rule.

Ans : def reduce_cards(hand):

```
    reduced_hand = hand // 2
    print("Your hand will be reduced to:", reduced_hand)

# Taking input from the user
cards = int(input("Enter the number of cards you have: "))
reduce_cards(cards)
```

3. Write a program that asks the user to enter a positive integer. Then generate a random number between that number and 10 more than that number and print the letter A that many times on the same line.

Ans: import random

```
def print_A_random_times(number):
    random_number = random.randint(number, number + 10)
    print('A' * random_number)

# Taking input from the user
number = int(input("Enter a positive integer: "))
print_A_random_times(number)
```

4. This is a very simple billing program. Ask the user for a starting hour and ending hour, both given in
24-hour format (e.g., 1 pm is 13, 2 pm is 14, etc.). The charge to use the service is $5.50 per hour. Print
out the user's total bill. You can assume that the service will be used for at least 1 hour and never more than 23 hours. Be careful to take care of the case that the starting hour is before midnight and
the ending time is after midnight.

Ans:

```
def calculate_bill(start_hour, end_hour):

  if end_hour < start_hour:

    end_hour += 24  # Handling the case when the ending hour is after midnight

  total_hours = end_hour - start_hour

  total_bill = total_hours * 5.50

  print("Total bill: $", total_bill)

# Taking input from the user

start_hour = int(input("Enter the starting hour (24-hour format): "))

end_hour = int(input("Enter the ending hour (24-hour format): "))

calculate_bill(start_hour, end_hour)
```

5. One way to estimate probabilities is to run what is called a computer simulation. Here we will estimate
the probability of rolling doubles with two dice (where both dice come out to the same value). To
do this, run a loop 10,000 times in which random numbers are generated representing the dice and
a count is kept of how many times doubles appear. Print out the final percentage of rolls that are
doubles.

Ans:

```
import random

def roll_dice():

  return random.randint(1, 6)

def calculate_probability():

  total_rolls = 10000
```

```
 doubles_count = 0
    for _ in range(total_rolls):
        dice1 = roll_dice()
        dice2 = roll_dice()
        if dice1 == dice2:
            doubles_count += 1
    probability = (doubles_count / total_rolls) * 100
    print("Percentage of rolls that are doubles:", probability)
calculate_probability()
```