SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

19IT103 – COMPUTATIONAL THINKING AND PYTHON PROGRAMMING

❖A readable, dynamic, pleasant, flexible, fast and powerful language

Recap:

1. Find a minimum in a list :

- One way is to sort the list of elements in ascending order and get the first element as minimum.

- Another method is to compare each element with other.

  - As an initial step, first element of the list is considered as minimum element.

  - And in each iteration, each element in the list is compared with the minimum.

  - If the element in the list is less than the minimum then swap both elements else compare with the next element in the list.

  - These steps are continued until the end of the list and finally print the minimum.
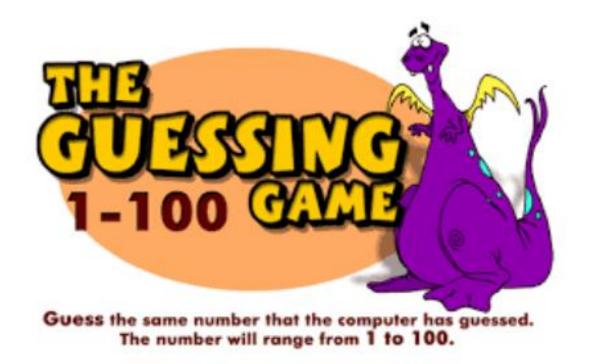
<u>Recap:</u>

2. insert a card in a list of sorted cards :

- Start with an empty left hand and cards face down on the table.

- Then remove one card at a time from the table and Insert it into the correct position in the left hand.

- To find a correct position for a card, we compare it with each of the cards already in the hand from left to right.

- Once the position is found, the cards from that position are moved to the next higher indexed position and in that order.

- New card is inserted at the current position.

1.9 Illustrative problems:

- Guess an integer number in a range

- Tower of Hanoi

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1.9.1 Guess an integer number in a range :

Guess the same number that the computer has guessed.
The number will range from 1 to 100.

1.9.1 Guess an integer number in a range :

Problem Statement:

- Shankar and Vijay are playing a game of integers.

- Shankar chooses an integer of his choice in his mind.

- It can be any integer value within the range of 1 to 100.

- Now, Vijay had to find that integer through some guesses.

1.9.1 Guess an integer number in a range :

<u>Problem Statement:</u>

Shankar can provides 3 hints to Vijay, each hint can be one of the below types:

- Type 1 : Guess is Low

- Type 2 : Guess is High

- Type 3 : You guessed my number!

- Now Vijay has to make some guesses in order to find Shankar's integer.

- Note: Vijay is given only 10 chances to guess the number. If Vijay wins the game, then return **True** otherwise return **False**.

1.9.1 Guess an integer number in a range :

Python coding:

```python
import random

def ask_for_guess():
    '''returns an integer number as guessed by the user'''
    while True:
        guess = input('> ')  # Enter the guess.

        if guess.isdecimal():
            return int(guess)  # Convert string guess to an integer.
        print('Please enter a number between 1 and 100.')

print('*** Guess the Number ***')
print()
secretNumber = random.randint(1, 100)  # Select a random number.
print('I am thinking of a number between 1 and 100.')
```

1.9.1 Guess an integer number in a range :

Python coding:

```python
for i in range(10):  # Give the player 10 guesses.
    print('You have {} guesses left. Take a guess.'.format(10 - i))

    guess = ask_for_guess()
    if guess == secretNumber:
        break  # Break out of the for loop if the guess is correct.

    # Offer a hint:
    if guess < secretNumber:
        print('Your guess is too low.')
    if guess > secretNumber:
        print('Your guess is too high.')

# Reveal the results:
if guess == secretNumber:
    print('Yay! You guessed my number!')
else:
    print('Game over. The number I was thinking of was', secretNumber)
```

1.9.1 Guess an integer number in a range :

Output:

```
*** Guess the Number ***

I am thinking of a number between 1 and 100.
You have 10 guesses left. Take a guess.
> 50
Your guess is too high.
You have 9 guesses left. Take a guess.
> 25
Your guess is too low.
You have 8 guesses left. Take a guess.
> 35
Your guess is too low.
You have 7 guesses left. Take a guess.
> 45
Your guess is too low.
You have 6 guesses left. Take a guess.
> 48
Your guess is too low.
You have 5 guesses left. Take a guess.
> 49
Yay! You guessed my number!
```