

Module 3: Control Structures

Premanand S

Assistant Professor,
School of Electronics and Engineering,
Vellore Institute of Technology, Chennai

premanand.s@vit.ac.in

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Topics to be covered in Module 3,

- Decision making and Branching
- if, if – else, nested if, multi-way if-elif statements
- Looping - While loop, For loop, else clauses in the loop,
- Nested loop
- Break, Continue, and Pass Statements

Understanding the offset and Appending items to List

Example (Python Snippet)

```
num1 = 3  
string1 = 'Hello World'
```

List - Data Structure <Organising, Storing the data>

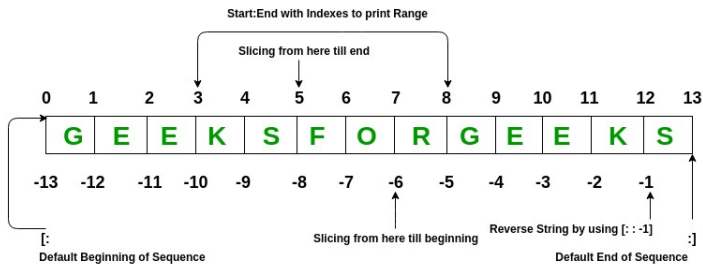
What if I need to store the states of India?

```
states = ['Tamilnadu', 'Kerela', 'Karnataka', 'Andhara'...  
[] - Mandatory
```

We can add any number of items in list in an orderly manner

```
rank = ['Python', 'C', 'JavaScript'...]
```

Offset



Understanding the offset and Appending items to List

Example (Python Snippet)

```
list1 = ['Ram','Sita','Balram']  
print(list1[0])  
print(list1[2])  
  
list2 = list1[2]  
print(list2)
```

Example (Python Snippet)

```
even_no = [2,4,6,8,10]  
odd_no = [1,3,5,7,9]  
combined_no = [even_no, odd_no]  
print(combined_no)
```

Example (Python Snippet)

```
fruits = ['apple', 'banana', 'cherry', 'dragon fruit']  
vegetables = ['Spinach', 'kale', 'tomato', 'potato', 'brinjal']  
purchase = [fruits, vegetables]  
print(purchase[1][1])
```

Rock Paper Scissor



Rock Paper Scissor

Example (Python Snippet)

```
import random

# Represent the choices with strings
game_images = ["Rock", "Paper", "Scissors"]

# Get the user's choice
user_choice = int(input("What do you choose? Type 0 for Rock,
if user_choice >= 3 or user_choice < 0:
    print("You typed an invalid number, you lose!")
else:
    print(f"You chose: {game_images[user_choice]}")
```

Rock Paper Scissor

Example (Python Snippet)

```
# Get the computer's choice
computer_choice = random.randint(0, 2)
print(f"Computer chose: {game_images[computer_choice]}")

# Determine the result
if user_choice == 0 and computer_choice == 2:
    print("You win!")
elif computer_choice == 0 and user_choice == 2:
    print("You lose!")
elif computer_choice > user_choice:
    print("You lose!")
elif user_choice > computer_choice:
    print("You win!")
else:
    print("It's a draw!")
```

Example (Python Snippet)

loops - Things that can happen over, over and over again

```
for ITEM in LIST_Of_ITEMS:  
    #Do something to each item
```

If I need to print the fruit one by one

Example (Python Snippet)

```
fruits = ['Apple', 'Peach', 'Pear']  
for fruit in fruits:  
    print(fruit)  
    print(fruit + 'pie')
```

Thonny IDE

Write a program that calculates the avg student height from the list of heights by using for loop

Example (Python Snippet)

Dont use sum and len function

```
# Input a list of student heights separated by commas
student_heights = input("Input a list of student heights
separated by commas: ").split(',')

# Convert the list of strings to a list of integers
for n in range(0, len(student_heights)):
    student_heights[n] = int(student_heights[n].strip())

print("Heights:", student_heights)
```

Write a program that calculates the avg student height from the list of heights by using for loop

Example (Python Snippet)

```
# Calculate the total height
total_height = 0
for height in student_heights:
    total_height += height
print("Total Height:", total_height)

# Calculate the number of students
number_of_students = 0
for student in student_heights:
    number_of_students += 1
print("Number of Students:", number_of_students)
```

Write a program that calculates the avg student height from the list of heights by using for loop

Example (Python Snippet)

```
# Calculate the average height and round it
average_height = round(total_height / number_of_students)
print("Average Height:", average_height)
```

Write a program that calculates the highest score from list of scores

Example (Python Snippet)

Important you are not allowed to use min or max functions

```
# Input a list of student scores separated by spaces
student_scores = input("Input a list of student scores
separated by spaces: ").split()

# Convert the list of strings to a list of integers
for n in range(0, len(student_scores)):
    student_scores[n] = int(student_scores[n])

# Initialize a variable to store the highest score
highest_score = student_scores[0]
```


Write a program that calculates the highest score from list of scores

Example (Python Snippet)

```
# Iterate through the list to find the highest score
for score in student_scores:
    if score > highest_score:
        highest_score = score

# Print the highest score
print(f"The highest score in the class is: {highest_score}")
```