My Inspiration
Late. Shivlal Dhamone

Subject Teacher
Santosh Dhamone

Practical No. 22: Sum of first n numbers:

Practical based on accepting a positive integer n from the user, obtaining the sum of $1 + 2 + +n$, $1^2 + 2^2 + +n^2$, $1^3 + 2^3 + +n^3$, and finally verifying that these sums equal $\frac{n(n+1)}{2}$, $\frac{n(n+1)(2n+1)}{6}$ and $\frac{n^2(n+1)^2}{4}$

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4^{th} October 2024

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Practical based on accepting a positive integer n from the user, obtaining the sum of $1 + 2 + +n$ and verifying $\frac{n(n+1)}{2}$:

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First Python Code:: Sum of $1 + 2 + +n$ and verifying $\frac{n(n+1)}{2}$:

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Code Python

[2]:
```
# Practical based on accepting a positive integer n from the user,
# obtaining the sum of 1 + 2 + ··· + n, and finally verifying n(n+1)/2
# Prompt the user for input and convert it to an integer.
n = int(input("Input a number: "))

# Calculate the sum of the first 'n' positive integers using the formula.
sum_num = (n * (n + 1)) / 2

# Print the result, indicating the sum of the first 'n' positive integers.
print("Sum of the first", n, "positive integers:", sum_num)
```

```
Input a number:  10
Sum of the first 10 positive integers: 55.0
```

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Practical based on accepting a positive integer n from the user, obtaining the sum of $1 + 2 + +n$ and verifying $\frac{n(n+1)}{2}$:

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Second Python Code:: Sum of $1 + 2 + +n$ and verifying $\frac{n(n+1)}{2}$:

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Code Python

```
[4]: # Practical based on accepting a positive integer n from the user,
     # obtaining the sum of 1 + 2 + ··· + n, and finally verifying n(n+1)/2
     # Prompt the user for input and convert it to an integer.
     n = int(input("Input an integer: "))

     # Calculate the sum of the first 'n' positive integers using the built-in 'sum' function
     result = sum(range(n+1))

     # Print the result, indicating the sum of the first 'n' positive integers.
     print("Sum of the first", n, "positive integers:", result)
```

```
Input an integer:  10
Sum of the first 10 positive integers: 55
```

Practical based on accepting a positive integer n from the user, obtaining the sum of $1 + 2 + +n$ and verifying $\frac{n(n+1)}{2}$:

Another example:: Sum of $1 + 2 + +n$ and verifying $\frac{n(n+1)}{2}$:

[6]:
```
# Practical based on accepting a positive integer n from the user,
# obtaining the sum of 1 + 2 + ··· + n, and finally verifying n(n+1)/2
# Prompt the user for input and convert it to an integer.
n = int(input("Input a number: "))

# Calculate the sum of the first 'n' positive integers using the formula.
sum_num = (n * (n + 1)) / 2

# Print the result, indicating the sum of the first 'n' positi.e integers.
print("Sum of the first", n, "positive integers:", sum_num)
```

```
Input a number:  125
Sum of the first 125 positive integers: 7875.0
```

Practical based on accepting a positive integer n from the user, obtaining the sum of $1 + 2 + +n$ and verifying $\frac{n(n+1)}{2}$:

Another example:: Sum of $1 + 2 + +n$ and verifying $\frac{n(n+1)}{2}$:

[8]:
```
# Practical based on accepting a positive integer n from the user,
# obtaining the sum of 1 + 2 + ··· + n, and finally verifying n(n+1)/2
# Prompt the user for input and convert it to an integer.
n = int(input("Input an integer: "))

# Calculate the sum of the first 'n' positive integers using the built-in 'sum' function
result = sum(range(n+1))

# Print the result, indicating the sum of the first 'n' positive integers.
print("Sum of the first", n, "positive integers:", result)
```

```
Input an integer:  500
Sum of the first 500 positive integers: 125250
```

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Practical based on accepting a positive integer n from the user, obtaining the sum of $1^2 + 2^2 + +n^2$ and verifying $\frac{n(n+1)(2n+1)}{6}$:

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First Python Code:: Sum of $1^2 + 2^2 + +n^2$ and verifying $\frac{n(n+1)(2n+1)}{6}$:

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Code Python

[12...

```
# Practical based on accepting a positive integer n from the user,
# obtaining the Sum of Squares and  verifying that n(n+1)(2n+1)/6
def sum_of_squares(n):
    total = 0
    for i in range(1, n + 1):
        total += i * i
    return total

# Example usage:
n = int(input("Input an integer: "))
result = sum_of_squares(n)
print(f"The sum of squares from 1 to {n} is: {result}")
```

```
Input an integer:  10
The sum of squares from 1 to 10 is: 385
```

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Practical based on accepting a positive integer n from the user, obtaining the sum of $1^2 + 2^2 + +n^2$ and verifying $\frac{n(n+1)(2n+1)}{6}$:

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Second Python Code:: Sum of $1^2 + 2^2 + +n^2$ and verifying $\frac{n(n+1)(2n+1)}{6}$:

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Code Python

[12...

```
# Practical based on accepting a positive integer n from the user,
# obtaining the Sum of Squares and  verifying that n(n+1)(2n+1)/6
def sum_of_squares(n):
    total = 0
    for i in range(1, n + 1):
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    return total

# Example usage:
n = int(input("Input an integer: "))
result = sum_of_squares(n)
print(f"The sum of squares from 1 to {n} is: {result}")
```

```
Input an integer:  10
The sum of squares from 1 to 10 is: 385
```

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Practical based on accepting a positive integer n from the user, obtaining the sum of $1^2 + 2^2 + +n^2$ and verifying $\frac{n(n+1)(2n+1)}{6}$:

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Another example:: Sum of $1^2 + 2^2 + +n^2$ and verifying $\frac{n(n+1)(2n+1)}{6}$:

```python
# Practical based on accepting a positive integer n from the user,
# obtaining the Sum of Squares and  verifying that n(n+1)(2n+1)/6
def sum_of_squares(n):
    total = 0
    for i in range(1, n + 1):
        total += i * i
    return total

# Example usage:
n = int(input("Input an integer: "))
result = sum_of_squares(n)
print(f"The sum of squares from 1 to {n} is: {result}")
```

```
Input an integer:  150
The sum of squares from 1 to 150 is: 1136275
```

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Practical based on accepting a positive integer n from the user, obtaining the sum of $1^2 + 2^2 + +n^2$ and verifying $\frac{n(n+1)(2n+1)}{6}$:

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Another example:: Sum of $1^2 + 2^2 + +n^2$ and verifying $\frac{n(n+1)(2n+1)}{6}$:

```python
# Practical based on accepting a positive integer n from the user,
# obtaining the Sum of Squares and  verifying that n(n+1)(2n+1)/6
def sum_of_squares(n):
    return (n * (n + 1) * (2 * n + 1)) // 6

# Example usage:
n = int(input("Input an integer: "))
result = sum_of_squares(n)
print(f"The sum of squares from 1 to {n} is: {result}")
```

```
Input an integer:  100
The sum of squares from 1 to 100 is: 338350
```