Function (1A)

Young Won Lim
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Task: Finding Partial Sums (1)

$$S_n = \sum_{k=1}^{n} a_k$$

$$a_k = k$$

$$S_1 = \sum_{k=1}^{1} k = 1$$

```
printf("S_1 = %d \n", S_1);
```

$$S_2 = \sum_{k=1}^{2} k = 1 + 2$$

```
printf("S_2 = %d \n", S_2);
```

$$S_3 = \sum_{k=1}^{3} k = 1 + 2 + 3$$

```
printf("S_3 = %d \n", S_3);
```

Task: Finding Partial Sums (2)

$$S_1 = \sum_{k=1}^{1} k = 1$$

```
S_1 = 0;
for (k=1; k<=1; ++k) S_1 += k;
```

```
printf("S_1 = %d \n", S_1);
```

$$S_2 = \sum_{k=1}^{2} k = 1 + 2$$

```
S_2 = 0;
for (k=1; k<=2; ++k) S_2 += k;
```

```
printf("S_2 = %d \n", S_2);
```

$$S_3 = \sum_{k=1}^{3} k = 1 + 2 + 3$$

```
S_3 = 0;
for (k=1; k<=3; ++k) S_3 += k;
```

```
printf("S_3 = %d \n", S_3);
```

Task: Finding Partial Sums (3)

```
ni = 1;
{
        int n = ni;
        int S = 0;
        for (k=1; k<=n; ++k) S += k;
}
S_1 = S;
```

```
printf("S_1 = %d \n", S_1);
```

```
ni = 2;
{
        int n = ni;
        int S = 0;
        for (k=1; k<=n; ++k) S += k;
}
S_2 = S;
```

```
printf("S_2 = %d \n", S_2);
```

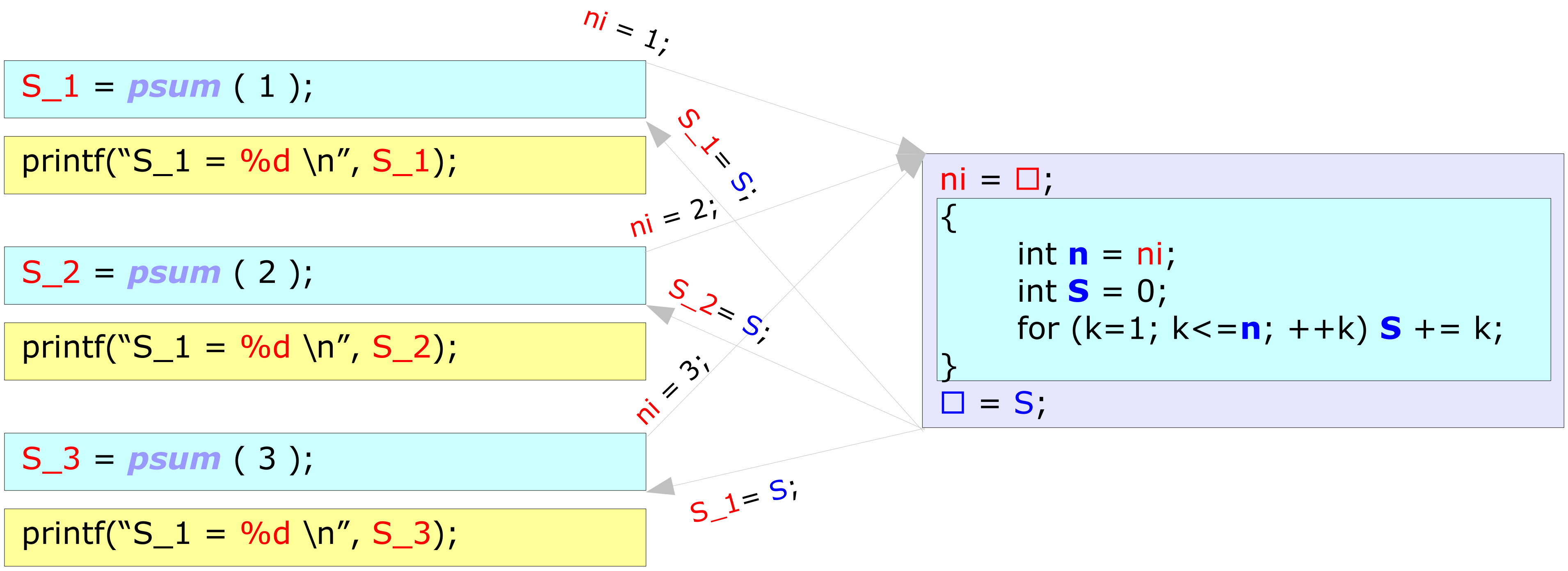
```
ni = 3;
{
        int n = ni;
        int S = 0;
        for (k=1; k<=n; ++k) S += k;
}
S_3 = S;
```

```
printf("S_3 = %d \n", S_3);
```

```
int psum(int n)
{
        int S = 0;
        for (k=1; k<=n; ++k) S += k;
        return S;
}
```

Task: Finding Partial Sums (4)

```
int psum(int n)
{
        int S = 0;
        for (k=1; k<=n; ++k) S += k;
        return S;
}
```



```
S_1 = psum ( 1 );

printf("S_1 = %d \n", S_1);

S_2 = psum ( 2 );

printf("S_1 = %d \n", S_2);

S_3 = psum ( 3 );

printf("S_1 = %d \n", S_3);
```

```
ni = □;
{
        int n = ni;
        int S = 0;
        for (k=1; k<=n; ++k) S += k;
}
□ = S;
```

Task: Finding Partial Sums (5)

```
int psum(int n)
{
      int S = 0;
      for (k=1; k<=n; ++k) S += k;
      return S;
}
```

Function Definition

```
S_1 = psum ( 1 );        // Function Call
```

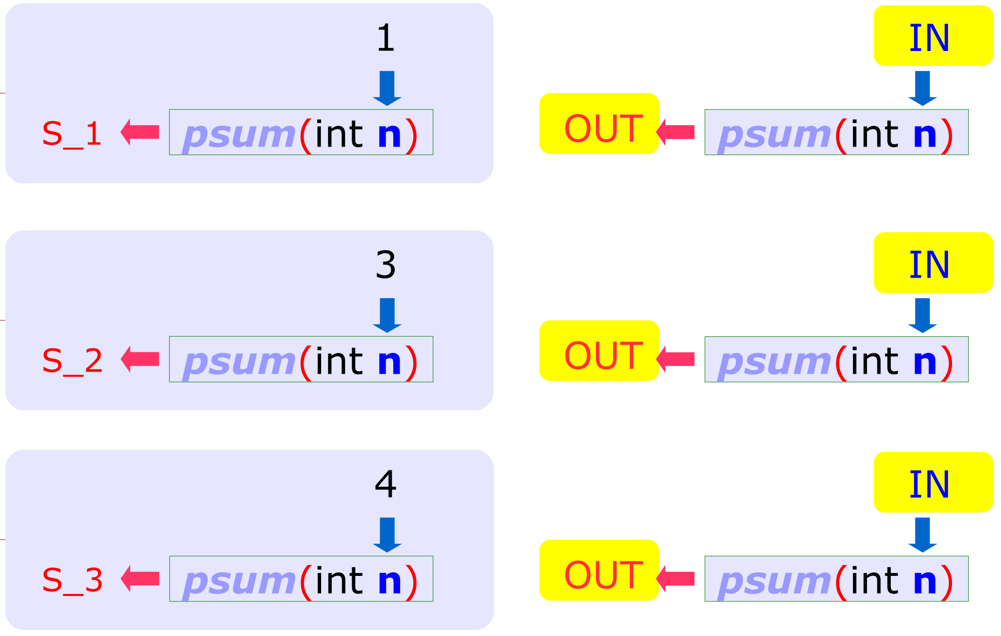
```
printf("S_1 = %d \n", S_1);
```

```
S_2 = psum ( 2 );        // Function Call
```

```
printf("S_1 = %d \n", S_2);
```

```
S_3 = psum ( 3 );        // Function Call
```

```
printf("S_1 = %d \n", S_3);
```



Function Definition

```
int psum(int n)
{
      int S = 0;
      for (k=1; k<=n; ++k) S += k;
      return S;
}
```

```
<return-type>  function-name  ( <parameter-list> )
{
      <statements>
      return <expression of return-type>;
}
```

```
( data-type var, data-type var, data-type var , ....  )
```

```
int mult(int m, int n)
{
      return m*n;
}
```

Function Declaration

```
int psum(int n)
{
      int S = 0;
      for (k=1; k<=n; ++k) S += k;
      return S;
}
```

```
<return-type>  function-name ( <parameter-list> )
{
      <statements>
      return <expression of return-type>;
}
```

```
int mult(int m, int n)
{
      return m*n;
}
```

```
( data-type var, data-type var, data-type var , ....  )
```

2-d Array

References

[1] Essential C, Nick Parlante
[2] Efficient C Programming, Mark A. Weiss
[3] C A Reference Manual, Samuel P. Harbison & Guy L. Steele Jr.
[4] C Language Express, I. K. Chun