

<texit info> author=Roman Putanowicz title=Solution to exercise 4.1.1 </texit>

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Solution to exercise 4.1.1

Firstly we should note that our expression can be transformed to an equivalent form:

$$\sum_{j=1}^N b_j \left(\sum_{i=1}^j a_i \right)$$

Then we should also note that there is no need to calculate the inner sum from scratch for each new “j” – we can update it from the previous j-iteration. Thus the expression value can be calculated with a single loop.

For a convenience in the solution presented below we implement the sequences “a” and “b” with separate functions.

```
<sxh c> N = input("Give N : ");
```

```
function av = a(i)
```

```
av = sin(2*pi*i+1);
```

```
endfunction
```

```
function bv = b(i)
```

```
bv = 1/(1+i);
```

```
endfunction
```

```
totalsum = 0; asum = 0; for j=1:N
```

```
asum = asum + a(j);
totalsum = totalsum + b(j) * asum;
```

```
endfor
```

```
printf("Expression value = %g\n",totalsum); </sxh>
```

```
<texit> \begin{lstlisting} N = input("Give N : ");
```

```
function av = a(i)
```

```
av = sin(2*pi*i+1);
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asum = asum + a(j);  
totalsum = totalsum + b(j) * asum;
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endfor

printf("Expression value = %g\n",totalsum); \end{lstlisting} </texit>

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