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## Interpolation Polynomial with C++

Contoh Input/Output

Format input:

```
n-1
x1 y1
x2 y2
...
xn-1 yn-1
xn yn
```

Format output:

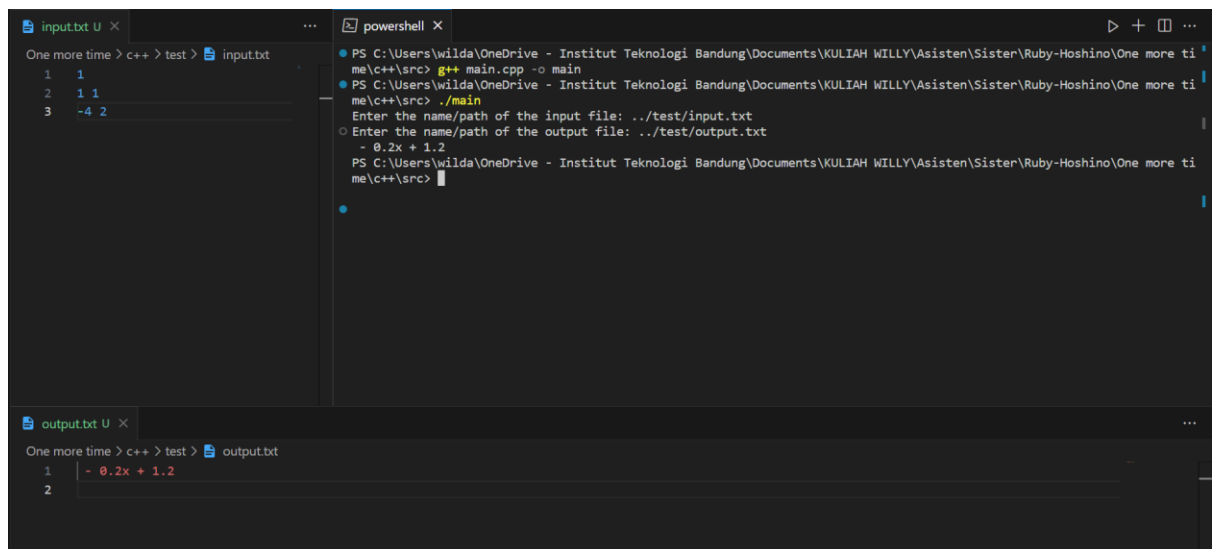
```
ax^n + bx^{n-1} + ... + px + q
```

yang berarti  $y = ax^n + bx^{n-1} + \dots + px + q$

dengan ^ merupakan pangkat yang berarti  $ax^{**n} = ax^n$

$N = n - 1$

### 1. $N = 1$

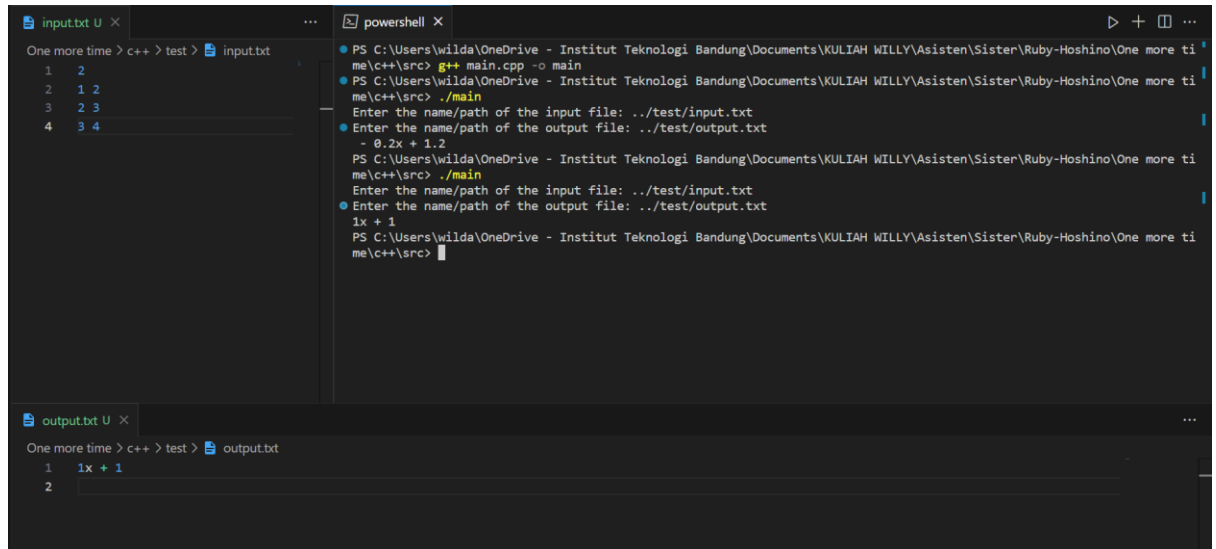


```
input.txt U x
One more time > c++ > test > input.txt
1 1
2 1 1
3 -4 2

powershell X
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src> g++ main.cpp -o main
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
- 0.2x + 1.2
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src>

output.txt U x
One more time > c++ > test > output.txt
1 - 0.2x + 1.2
2
```

## 2. $N = 2$

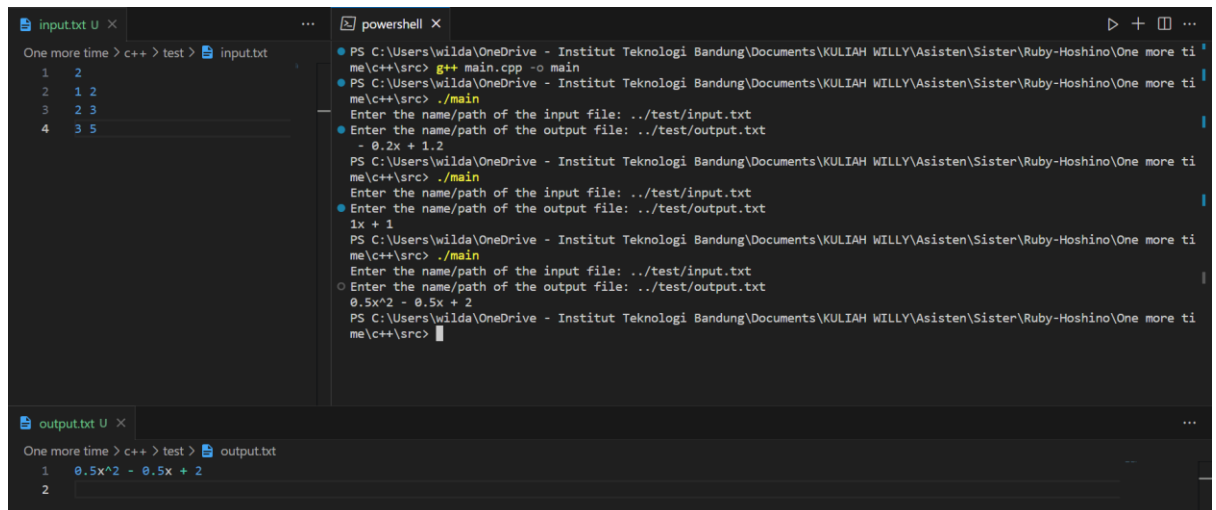


```
input.txt U X
One more time > c++ > test > input.txt
1 2
2 1 2
3 2 3
4 3 4

powershell X
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src> g++ main.cpp -o main
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
- 0.2x + 1.2
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
1x + 1
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src>

output.txt U X
One more time > c++ > test > output.txt
1 1x + 1
2
```

## 3. $N = 2$

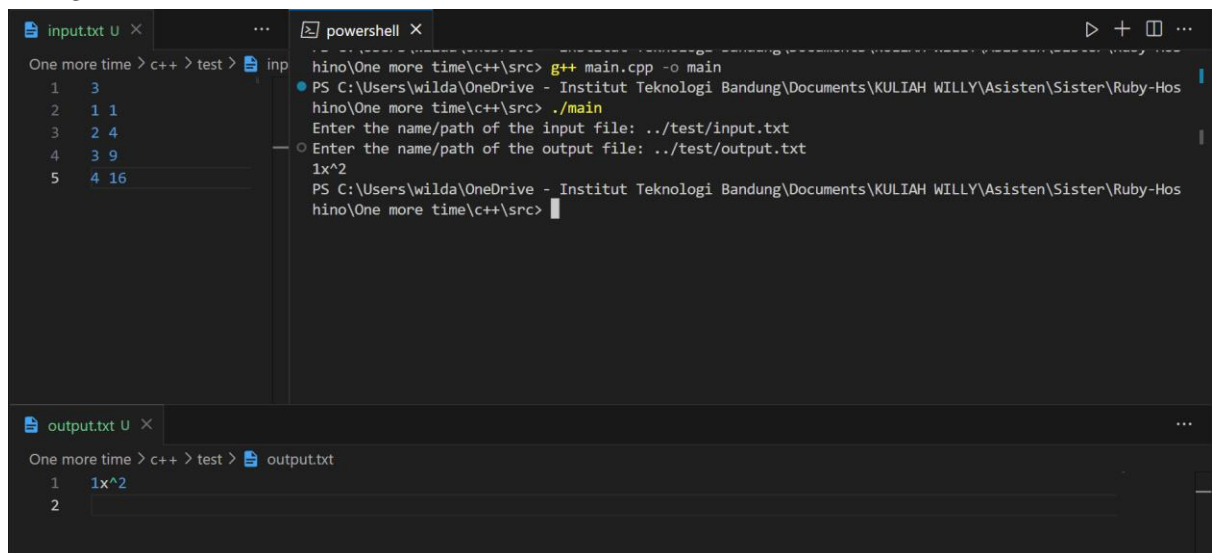


```
input.txt U X
One more time > c++ > test > input.txt
1 2
2 1 2
3 2 3
4 3 5

powershell X
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src> g++ main.cpp -o main
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
- 0.2x + 1.2
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
1x + 1
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
0.5x^2 - 0.5x + 2
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hoshino\One more ti
me\c++\src>

output.txt U X
One more time > c++ > test > output.txt
1 0.5x^2 - 0.5x + 2
2
```

## 4. $N = 3$



```
input.txt U X
One more time > c++ > test > inp
1 3
2 1 1
3 2 4
4 3 9
5 4 16

powershell X
hino\One more time\c++\src> g++ main.cpp -o main
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
1x^2
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src>

output.txt U X
One more time > c++ > test > output.txt
1 1x^2
2
```

## 5. $N = 3$

The screenshot shows a C++ IDE with two tabs: 'input.txt' and 'output.txt'. The 'input.txt' tab displays the following input data:

```

1 3
2 1 2
3 2 3
4 3 4
5 4 5

```

The 'output.txt' tab displays the following output:

```

1 0.999999x + 1
2

```

The background shows a PowerShell terminal window with the following commands and output:

```

PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> g++ main.cpp -o main
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
1x^2
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
0.999999x + 1
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src>

```

## 6. $N = 3$

The screenshot shows a C++ IDE with two tabs: 'input.txt' and 'output.txt'. The 'input.txt' tab displays the following input data:

```

1 3
2 1 10
3 2 2
4 3 5
5 4 1

```

The 'output.txt' tab displays the following output:

```

1 - 3x^3 + 23.5x^2 - 57.5x + 47
2

```

The background shows a PowerShell terminal window with the following commands and output:

```

PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
1x^2
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
0.999999x + 1
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
- 3x^3 + 23.5x^2 - 57.5x + 47
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src>

```

## 7. $N = 4$

The screenshot shows a C++ IDE with two tabs: 'input.txt' and 'output.txt'. The 'input.txt' tab displays the following input data:

```

1 4
2 0 1
3 1 1
4 2 1
5 3 1
6 4 1

```

The 'output.txt' tab displays the following output:

```

1 1
2

```

The background shows a PowerShell terminal window with the following commands and output:

```

PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
0.999999x + 1
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
- 3x^3 + 23.5x^2 - 57.5x + 47
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src> ./main
Enter the name/path of the input file: ../test/input.txt
Enter the name/path of the output file: ../test/output.txt
1
PS C:\Users\wilda\OneDrive - Institut Teknologi Bandung\Documents\KULIAH WILLY\Asisten\Sister\Ruby-Hos
hino\One more time\c++\src>

```

## 8. $N = 4$

The screenshot shows a C++ IDE with two tabs: 'input.txt' and 'output.txt'. The 'input.txt' tab shows the following data:

```

1 4
2 0 0
3 1 0
4 2 0
5 3 0
6 4 1
7

```

The 'output.txt' tab shows the following polynomial expression:

```

1 0.0416667x^4 - 0.25x^3 + 0.458333x^2 - 0.25x
2

```

The PowerShell console shows the execution of the program, including prompts for input and output file paths and the execution of the main function.

## 9. $N = 7$

The screenshot shows a C++ IDE with two tabs: 'input.txt' and 'output.txt'. The 'input.txt' tab shows the following data:

```

1 7
2 0 0
3 1 0
4 2 0
5 3 0
6 4 1
7 5 1
8 6 1
9 7 1

```

The 'output.txt' tab shows the following polynomial expression:

```

1 - 0.00396825x^7 + 0.0972222x^6 - 0.936111x^5 + 4.47222x^4 - 10.9861x^3 + 12.9306x^2 - 5.57381x
2

```

The PowerShell console shows the execution of the program, including prompts for input and output file paths and the execution of the main function.

## 10. $N = 10$

The screenshot shows a C++ IDE with two tabs: 'input.txt' and 'output.txt'. The 'input.txt' tab shows the following data:

```

1 10
2 1 10
3 2 2
4 3 5
5 4 1
6 6 1
7 -10 -10
8 0 0
9 18 100
10 -100 100
11 200 10
12 150 -150

```

The 'output.txt' tab shows the following polynomial expression:

```

1 - 0.00255659x^7 + 0.0551729x^6 - 0.00597638x^5 - 4.59093x^4 + 28.3321x^3 - 63.3193x^2 + 49.5316x
2

```

The PowerShell console shows the execution of the program, including prompts for input and output file paths and the execution of the main function.