Report of Lab Project

Number 1:

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Course code: CSE-432

Course title: Digital Signal Processing Lab

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Number 2:

Task-3

Subtask: 3.1

Number 3:

Test case: 1

Signal: $(\delta[n] + U[n-1]) + (Ur[2m]) - (Ur[-(m)])$; $-4 \leq n \leq 3$; $-5 \leq m \leq 5$

Explanation	Input
Enter Number of test case :	1
Enter Number of parts :	3
Enter lower bound :	-4
Enter upper bound :	3
Enter the number of component :	2
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	1
The component has any shifting operation (1 = yes, 2 = no) :	2
The component has any mirroring operation (1 = yes, 2 = no) :	2
The component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the operator type (1 = add, 2 = sub, 3 = mul) :	1
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	2
The component has any shifting operation (1 = yes, 2 = no) :	1
Enter shifting amount (positive number denotes signal delay, negative number denotes signal advances, zero means no shifting) :	1
The component has any mirroring operation (1 = yes, 2 = no) :	2

The component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the part operator type (1 = add, 2 = sub, 3 = mul) :	1
Enter lower bound :	-5
Enter upper bound :	5
Enter the number of component :	1
Enter the scaling number :	2
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	3
The component has any shifting operation (1 = yes, 2 = no) :	2
The component has any mirroring operation (1 = yes, 2 = no) :	2
The component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the part operator type (1 = add, 2 = sub, 3 = mul) :	2
Enter lower bound :	-5
Enter upper bound :	5
Enter the number of component :	1
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	3
The component has any shifting operation (1 = yes, 2 = no) :	2
The component has any mirroring operation (1 = yes, 2 = no) :	1
The component has any downsampling operation (1 = yes, 2 = no) :	2

Output: [-5. -4. -3. -2. -1. 0. 1. 2. 3. 4. 5.] [-5. -4. -3. -2. -1. 1. 3. 5. 7. 8. 10.]

Test case: 2

Signal: $(2Ur[-(n+5)] - Ur[2n] + U[n-1]) - (4U[m] * 2\delta[m]) + (U[-(k-1)])$; $-7 \le n \le 7$; $-5 \le m \le 8$; $-8 \le k \le 5$

Explanation	Input
Enter Number of test case :	1
Enter Number of parts :	3
Enter lower bound :	-7
Enter upper bound :	7
Enter the number of component :	3
Enter the scaling number :	2
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	3
the component has any shifting operation (1 = yes, 2 = no) :	1
Enter shifting amount (positive number denotes signal delay, negative number denotes signal advances, zero means no shifting) :	-5
the component has any mirroring operation (1 = yes, 2 = no) :	1
the component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the operator type (1 = add, 2 = sub, 3 = mul) :	2
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	3
the component has any shifting operation (1 = yes, 2 = no) :	2
the component has any mirroring operation (1 = yes, 2 = no) :	2
the component has any downsampling operation (1 = yes, 2 = no) :	1

Enter downsampling amount :	2
Enter the operator type (1 = add, 2 = sub, 3 = mul) :	1
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	2
the component has any shifting operation (1 = yes, 2 = no) :	1
Enter shifting amount (positive number denotes signal delay, negative number denotes signal advances, zero means no shifting) :	1
the component has any mirroring operation (1 = yes, 2 = no) :	2
the component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the part operator type (1 = add, 2 = sub, 3 = mul) :	2
Enter lower bound :	-5
Enter upper bound :	8
Enter the number of component :	2
Enter the scaling number :	4
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	2
the component has any shifting operation (1 = yes, 2 = no) :	2
the component has any mirroring operation (1 = yes, 2 = no) :	2
the component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the operator type (1 = add, 2 = sub, 3 = mul) :	3
Enter the scaling number :	2
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	1
the component has any shifting operation (1 = yes, 2 = no) :	2
the component has any mirroring operation (1 = yes, 2 = no) :	2
the component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the part operator type (1 = add, 2 = sub, 3 = mul) :	1
Enter lower bound :	-8
Enter upper bound :	5
Enter the number of component :	1
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	2
the component has any shifting operation (1 = yes, 2 = no) :	1
Enter shifting amount (positive number denotes signal delay, negative number denotes signal advances, zero means no shifting) :	1
the component has any mirroring operation (1 = yes, 2 = no) :	1
the component has any downsampling operation (1 = yes, 2 = no) :	2

Output:

[-8. -7. -6. -5. -4. -3. -2. -1. 0. 1. 2. 3. 4. 5. 6. 7. 8.] [0. 0. 0. 1. 1. 1. 15. 13. 2. 7. 3. -1. 3. 1. 1. 1. 0.]

Test case: 3

Signal: $(4Ur[-(n+5)] - 2Ur[2n] + U[n-1]) - (4U[m] * 2\delta[m]) + (U[-(k-1)])$; $-7 \le n \le 5$; $-5 \le m \le 15$; $-8 \le k \le 9$

$(\delta[n] + U[n-1]) + (Ur[2m]) - (Ur[-(m)])$; $-5 \le n \le 3$; $-10 \le m \le 5$

Explanation	Input
Enter Number of test case :	2
Enter Number of parts :	3
Enter lower bound :	-7
Enter upper bound :	5
Enter the number of component :	3
Enter the scaling number :	4
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	3
the component has any shifting operation (1 = yes, 2 = no) :	1
Enter shifting amount (positive number denotes signal delay, negative number denotes signal advances, zero means no shifting) :	-5
the component has any mirroring operation (1 = yes, 2 = no) :	1
the component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the operator type (1 = add, 2 = sub, 3 = mul) :	2
Enter the scaling number :	2
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	3
the component has any shifting operation (1 = yes, 2 = no) :	2
the component has any mirroring operation (1 = yes, 2 = no) :	2
the component has any downsampling operation (1 = yes, 2 = no) :	1
Enter downsampling amount :	2
Enter the operator type (1 = add, 2 = sub, 3 = mul) :	1
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	2
the component has any shifting operation (1 = yes, 2 = no) :	1
Enter shifting amount (positive number denotes signal delay, negative number denotes signal advances, zero means no shifting) :	1
the component has any mirroring operation (1 = yes, 2 = no) :	2
the component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the part operator type (1 = add, 2 = sub, 3 = mul) :	2
Enter lower bound :	-5
Enter upper bound :	15
Enter the number of component :	2
Enter the scaling number :	4
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	2
the component has any shifting operation (1 = yes, 2 = no) :	2
the component has any mirroring operation (1 = yes, 2 = no) :	2
the component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the operator type (1 = add, 2 = sub, 3 = mul) :	3
Enter the scaling number :	2
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	1
the component has any shifting operation (1 = yes, 2 = no) :	2
the component has any mirroring operation (1 = yes, 2 = no) :	2
the component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the part operator type (1 = add, 2 = sub, 3 = mul) :	1
Enter lower bound :	-8
Enter upper bound :	9

Enter the number of component :	1
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	2
the component has any shifting operation (1 = yes, 2 = no) :	1
Enter shifting amount (positive number denotes signal delay, negative number denotes signal advances, zero means no shifting) :	1
the component has any mirroring operation (1 = yes, 2 = no) :	1
the component has any downsampling operation (1 = yes, 2 = no) :	2
Enter Number of parts :	3
Enter lower bound :	-5
Enter upper bound :	3
Enter the number of component :	2
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	1
The component has any shifting operation (1 = yes, 2 = no) :	2
The component has any mirroring operation (1 = yes, 2 = no) :	2
The component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the operator type (1 = add, 2 = sub, 3 = mul) :	1
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	2
The component has any shifting operation (1 = yes, 2 = no) :	1
Enter shifting amount (positive number denotes signal delay, negative number denotes signal advances, zero means no shifting) :	1
The component has any mirroring operation (1 = yes, 2 = no) :	2
The component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the part operator type (1 = add, 2 = sub, 3 = mul) :	1
Enter lower bound :	-10
Enter upper bound :	5
Enter the number of component :	1
Enter the scaling number :	2
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	3
The component has any shifting operation (1 = yes, 2 = no) :	2
The component has any mirroring operation (1 = yes, 2 = no) :	2
The component has any downsampling operation (1 = yes, 2 = no) :	2
Enter the part operator type (1 = add, 2 = sub, 3 = mul) :	2
Enter lower bound :	-10
Enter upper bound :	5
Enter the number of component :	1
Enter the scaling number :	1
Enter signal type (1 = impulse, 2 = step, 3 = ramp) :	3
The component has any shifting operation (1 = yes, 2 = no) :	2
The component has any mirroring operation (1 = yes, 2 = no) :	1
The component has any downsampling operation (1 = yes, 2 = no) :	2

Output:

[-8. -7. -6. -5. -4. -3. -2. -1. 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15.] [1. 1. 1. 1. 1. 1. 1. 1. 12. 13. 5. 9. 5. 1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]

[-10. -9. -8. -7. -6. -5. -4. -3. -2. -1. 0. 1. 2. 3. 4. 5.] [0. 0. 0. 0. 0. -5. -4. -3. -2. -1. 1. 3. 5. 7. 8. 10.]

Number 4:

Yes, my program produces correct outputs for all test cases that I have tested.

No test cases produced errors.

Number 5:

Yes, I believe that all my programs are correct and has no errors of any sort.

Number 6:

Yes, subtask-3.2, 3.3

Number 7:

No help