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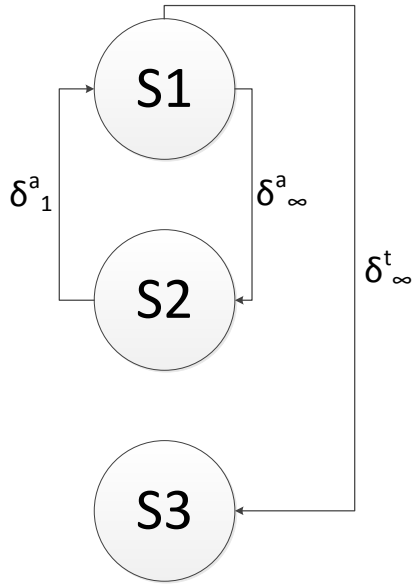
Question 1

Give the dependence graph for the following loop.

```
      for (i=0;i<n;i++){
S1:     B(i)=A(i)
S2:     A(i)=A(i)+B(i+1)
S3:     C(i)=2*B(i)
      }
```



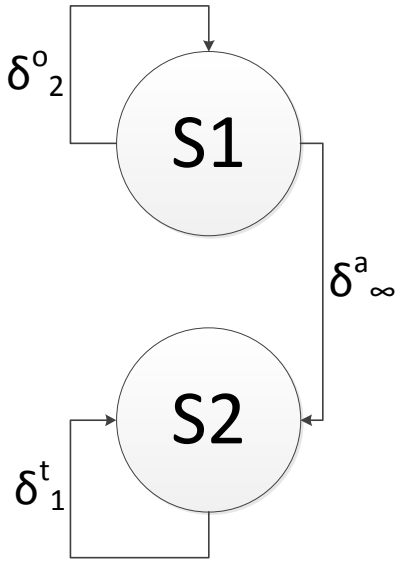
Give the distance and direction vectors for the loop-carried dependences in the last question.

Source	Sink	Type	Distance Vectors	Direction Vectors
S2: B(1+i)	S1: B(i)	a	(1)	(“<”)

Source, sink: Specify the references in the form S3:C(I) or S3: B(i) …
Type: true, anti, output
Vectors: n-Tuples where n is the depth of the loop nest

Give the dependence graph for the following loop.

```
      for (i=0;i<n;i++){
        for (j=1;j<m;j++){
S1:       A(i)=B(i,j)
S2:       B(i,j)= B(i-1,2*j)
        }
      }
```



Give the distance and direction vectors for the loop-carried dependences in the last question.

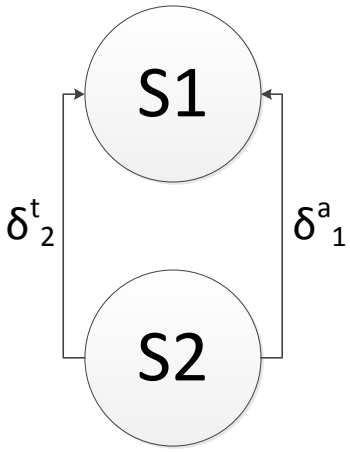
Source	Sink	Type	Distance Vectors	Direction Vectors
S1: A(i)	S1: A(i)	o	(0, *)	(“=”, “*”)
S2: B(i, j)	S2: B(i-1, 2*j)	t	(1, -j)	(“<”, “>”)

The „*“ in the distance vector means, that we access the same address in each iteration. Therefore, we don’t have a real distance vector.

Question 2

Give the dependence graph for the following loop.

```
        for (i=0;i<n;i++)
          for (j=0;j<m;j++){
S1:           B(i-1,j)=C(i,j-2)
S2:           C(i,j)=2*B(i,j+1)
          }
```



Source	Sink	Type	Distance Vectors	Direction Vectors
S2: B(i, j+1)	S1: B(i-1, j)	a	(1, 1)	(“<”, “<”)
S2: C(i, j)	S1: C(i, j-2)	t	(0, 2)	(“=”, “<”)