

# Assignment 5

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## Problem 1.

step	N	d(t), p(t)	d(u), p(u)	d(v), p(v)	d(w), p(w)	d(y), p(y)	d(z), p(z)
0	x	$\infty$	$\infty$	<b>3,x</b>	6,x	6, x	8, x
1	xv	7,v	6,v		<b>6,x</b>	6, x	8, x
2	xvw	7,v	6,v			<b>6, x</b>	8, x
2	xvwy	7,v	<b>6,v</b>				8, x
2	xvwyu	<b>7,v</b>					8, x
2	xvwyut						<b>8, x</b>
2	xvwyutz						

## Problem 2.

- Give x's distance vector for destinations w,y, and u.

	w	y	u
x	2	4	7

- $c(x, y) \in (0, 1)$ : the cost from  $y$  to  $u$  is 6, and the current shortest path from  $x$  to  $u$  is 7. In order to have new minimum cost path to  $u$ ,  $c(x, y)$  has to be in interval  $(0, 1)$ , and the new minimum cost path will be less than 7.  
 $c(x, w) > 6$ : in order to have new minimum cost path,  $c(x, w) + c(w, u)$  has to be greater than  $c(x, y) + c(y, u)$ .
- Similarly,  
 $c(x, y) \geq 1$ : the minimum path is still 7 as the path from  $x$  to  $u$  via  $y$  is bigger than 7