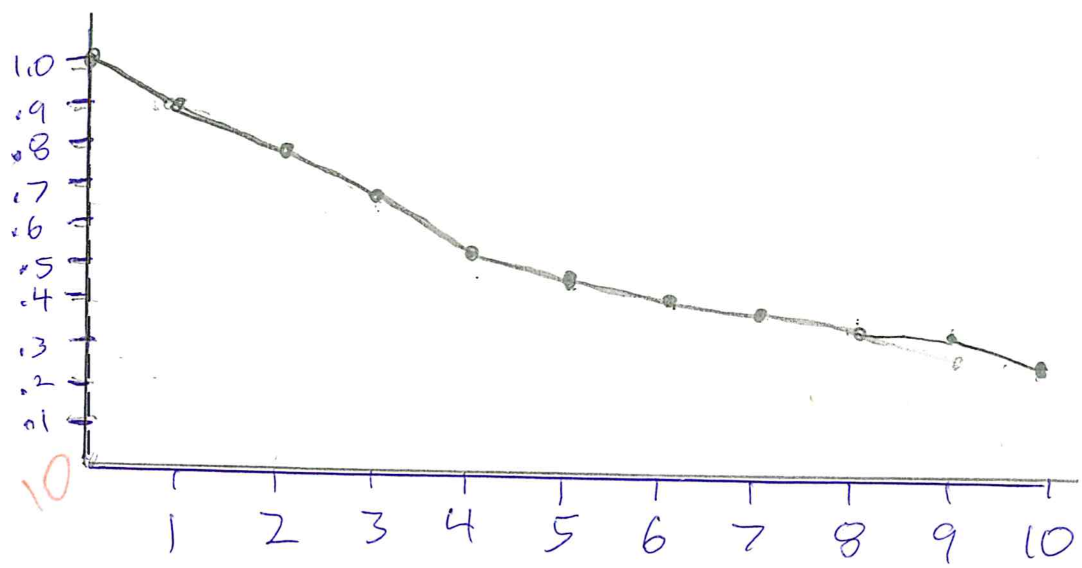
$I_j = [t_{j-1}, t_j)$ $\hat{S}_L(t_1) = \hat{S}_L(1) = \hat{S}_L(0)\ .8968 \quad \frac{n_1' - d_1}{n_1'}$

Math 473 Quiz 3 Spring 2017 Name____________________

YOU ARE BEING GRADED FOR WORK $\hat{S}_L(t_7) = \hat{S}_L(7) = \hat{S}_L(6)\ .9286 \quad \frac{n_7' - d_7}{n_7'}$

1) The Lindsey (2004, p. 280) data is for survival times for 234 women with stage 2 cervical cancer studied over a 10 year period. Use the life table estimator to compute the estimated survival function $\hat{S}_L(t_i)$ by filling in the table below. Show what you multiply to find $\hat{S}_L(t_i)$. Then plot the function.

j	I_j	d_j	c_j	n_j	$n'_j = n_j - \frac{c_j}{2}$	$\frac{n'_j - d_j}{n'_j}$	$\hat{S}_L(t_i)$ $= \hat{S}_L(t_{i-1}) \frac{n_i' - d_i}{n_i'}$
1	$[0, 1)$	24	3	234	232.5	0.8968	1.0000 $= \hat{S}_L(0)$
2	$[1, 2)$	27	11	207	201.5	0.8660	0.8968 $= \hat{S}_L(1)$
3	$[2, 3)$	31	9	169	164.5	0.8116	0.7766 $= \hat{S}_L(2)$
4	$[3, 4)$	17	7	129	125.5	0.8645	0.6302 $= \hat{S}_L(3)$
5	$[4, 5)$	7	13	105	98.5	0.9289	0.5448 $= \hat{S}_L(4)$
6	$[5, 6)$	6	6	85	82	0.9268	0.5061 $= \hat{S}_L(5)$
7	$[6, 7)$	5	6	73	70	0.9286	0.4691 $= \hat{S}_L(6)$
8	$[7, 8)$	3	10	62	57	.9474	.4691(.9286) = .4356 $= \hat{S}_L(7)$
9	$[8, 9)$	2	13	49	42.5	.9529	.4356(.9474) = .4127 $= \hat{S}_L(8)$
10	$[9, 10)$	4	6	34	31	.8710	.4127(.9529) = .3933 $= \hat{S}_L(9)$
40 11	$[10, \infty)$	24	0	24	24	0	.3933(.8710) = .3426 $= \hat{S}_L(10)$



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step -1
stop at 10
or -1

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2) Times (in weeks) until relapse below are for 12 patients with acute myelogeneous leukemia who reached a state of remission after chemotherapy. See Miller (1981, p. 49).
5, 5, 8, 8, 12, 16+, 23, 27, 30, 33, 43, 45
Compute the Kaplan Meier survival function $\hat{S}_K(t_i)$ by filling in the table below. Show what you multiply to find $\hat{S}_k(t_i)$. Then plot the function.

$t_{(j)}$	γ_j	t_i	$n_i = \sum_{j=1}^{n} t_{(j)} \geq t_i$	d_i	$\hat{S}_K(t_i)$
		$t_0 = 0$			$\hat{S}_K(0) = 1$
5	1	5	12	2	$\hat{S}_K(5) = 1(1-\frac{2}{12}) = .8333$
5	1				
8	1	8	10	2	$\hat{S}_K(8) = .8333(1-\frac{2}{10}) = .6666$
8	1				
12	1	12	8	1	$\hat{S}_K(12) = .6666(1-\frac{1}{8}) = .5833$
16	0				
23	1	23	6	1	$\hat{S}_K(23) = .5833(1-\frac{1}{6}) = .4861$
27	1	27	5	1	$\hat{S}_K(27) = .4861(1-\frac{1}{5}) = .3889$
30	1	30	4	1	$\hat{S}_K(30) = .3889(1-\frac{1}{4}) = .2917$
33	1	33	3	1	$\hat{S}_K(33) = .2917(1-\frac{1}{3}) = .1945$
43	1	43	2	1	$\hat{S}_K(43) = .1945(1-\frac{1}{2}) = .09725$
45	1	45	1	1	$\hat{S}_K(45) = .09725(1-\frac{1}{1}) = 0$

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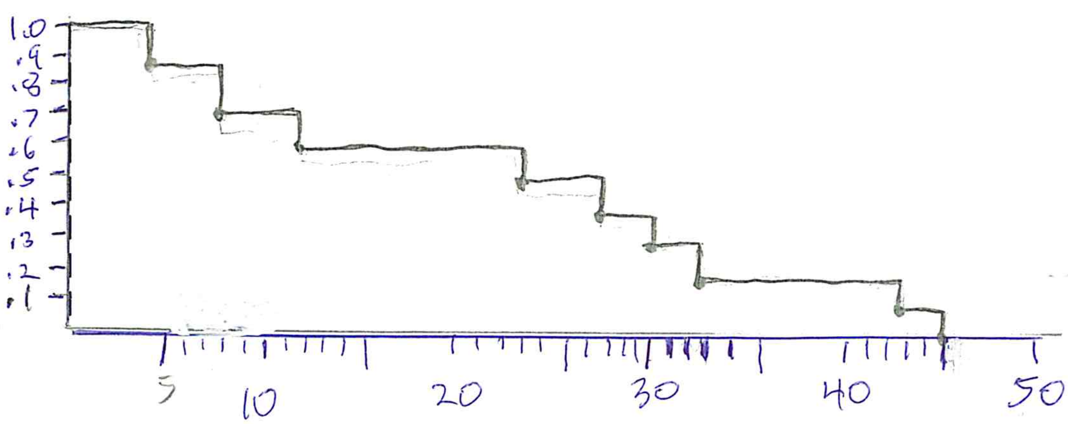
or good check unless last obs is censored



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