Task	a	m	b	Start Time	rand	Duartion	Finish Time	Average Duration
Demo	2	3	4	0	0.573546	3.076469744	3.07646974	20.08162564
Electrical	2	3.5	4	3.0764697	0.056036	2.410008731	5.48647847	**% Success**
Plumbing	1	2	2.5	3.0764697	0.70294	2.027988035	5.10445778	79.8
Drywall	5	6	8	5.4864785	0.821605	6.965413776	12.4518923	**Standard Dev.**
Painting	2	3	4.5	12.451892	0.1682	2.64845901	15.1003513	1.052350652
Lights	3	4	5	15.100351	0.34901	3.835476486	18.9358277	
Carpet	1	1.25	1.5	15.100351	0.977118	1.446518654	16.5468699	
Trim	2	3	4	16.54687	0.199887	2.632277404	19.1791473	

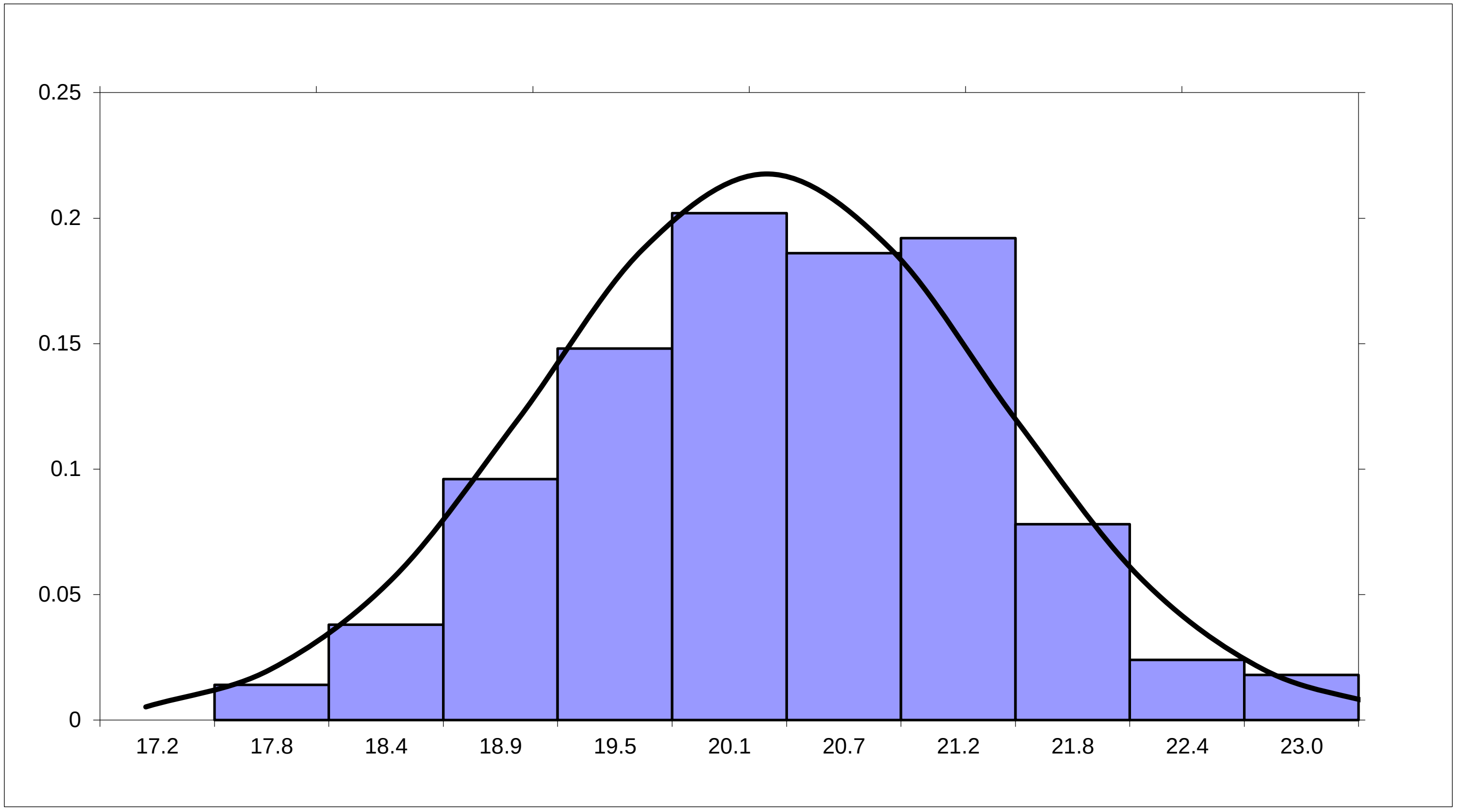
Project duration = 19.1791473

Deadline met? 1

bins = 11

bin width = 0.574009

bin	count	rel freq	bin width*f(x)
17.21158	0	0	0.005278662
17.78559	7	0.014	0.020136129
18.3596	19	0.038	0.057044859
18.93361	48	0.096	0.120017747
19.50762	74	0.148	0.187526583
20.08163	101	0.202	0.21760488
20.65564	93	0.186	0.187526583
21.22964	96	0.192	0.120017747
21.80365	39	0.078	0.057044859
22.37766	12	0.024	0.020136129
22.95167	9	0.018	0.005278662



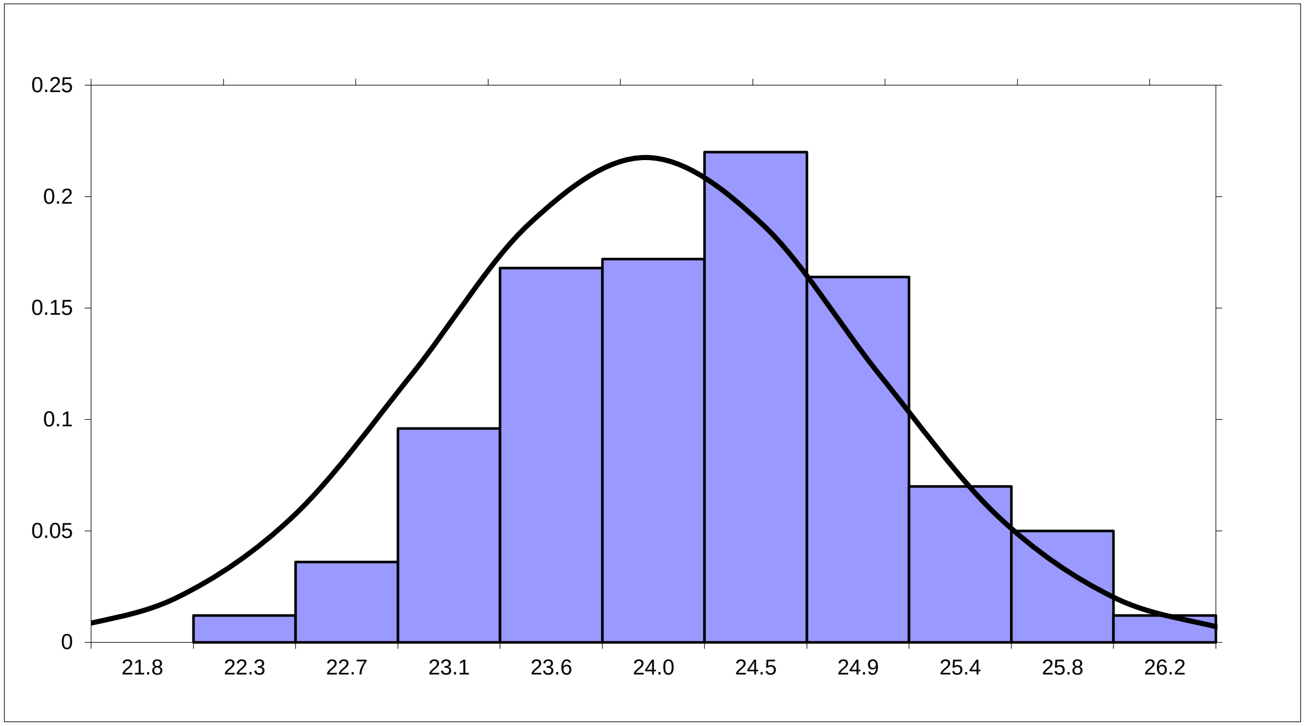
0.25
0.2
0.15
0.1
0.05
0
17.2
17.8
18.4
18.9
19.5
20.1
20.7
21.2
21.8
22.4
23.0

a	m	b	Start Time	rand	Duartion	Finish Time	Average Duration
2	3	4	0	0.2497104	3.707516	3.707516275	24.02512038
2	3.5	4	3.707516	0.6216583	4.120504	7.828020104	**% Success**
1	2	2.5	3.707516	0.1193171	2.906104	6.613620224	0
5	6	8	7.82802	0.6446992	7.366819	15.19483957	**Standard Dev.**
2	3	4.5	15.19484	0.4402992	3.388744	18.58358356	0.811053823
3	4	5	18.58358	0.0421116	4.956962	23.54054587	
1	1.25	1.5	18.58358	0.428951	1.34424	19.9278233	
2	3	4	19.92782	0.6195482	3.488975	23.41679817	

Project duration = 23.54054587

Deadline met? 0

11	bin	count	rel freq	in width*f(x)
0.44239299	21.81316	0	0	0.005279
	22.25555	6	0.012	0.020136
	22.69794	18	0.036	0.057045
	23.14033	48	0.096	0.120018
	23.58273	84	0.168	0.187527
	24.02512	86	0.172	0.217605
	24.46751	110	0.22	0.187527
	24.90991	82	0.164	0.120018
	25.3523	35	0.07	0.057045
	25.79469	25	0.05	0.020136
	26.23709	6	0.012	0.005279


0.25
0.2
0.15
0.1
0.05
0
21.8
22.3
22.7
23.1
23.6
24.0
24.5
24.9
25.4
25.8
26.2

The problem I chose to look at is a scheduling model with a different type of distribution. In class, we talked about a triangular distribution, where the probability that the duration is near m is much higher than the probability that it is near the optimistic or pessimistic estimate. My modification is to look at an m which has a probability of zero. This means that the probability that the duration is close to the optimistic or pessimistic duration estimations is much higher than the other model. In short, the project has a high probability of being completed very quickly or very slowly, without as much probability of finishing between the two estimates. The question was then how this would change the distribution and rate of success.

The data on the precedence constraints was simply taken from text. The optimistic, pessimistic, and least likely duration estimates are a, b, and m respectively. The assumtions are that there is a value between the worst and best-case completion times for each task that is very unlikely to occur. In fact, in this model, m is located directly on the x-axis, and so has a value of 0. This is very extreme, but works for our simple scenario.

This model was then built to reflect that. The two-piece linear function that describes the estimated completion times has a negative slope between a and m and a positive slope between m and b. It would have been possible to use a quadratic or function of higher degree, but this simple model communicated the same ideas with less complivated mathematics.

In the spreadsheets, I have included the triangular distribution model from the book that we did in class. On the next sheet I have changed the duration formula to reflect the new distribution. I have included a relative frequency historgram and then fit the appropriate density curve to it. To solve the model, I created the two-peice function, integrated and adjusted it to reflect the CDF and then found the inverse. The inverse was then used for the duration. The density curve that best fit is that of a normal density curve for both. This leads me to conclude that even though the estimations were distributed in this different pattern, it did not change the overall density curve of the graph, which makes sense. The standard deviation changed, although it actually was actually smaller in the new model, which was not expected. Also, the probability of success fell like a rock.

I think this is a reasonable model. I can sympathize with a construction company that has a production modeled by this problem! However, it is a little disturbing how the success rate was affected. In refining this model, I would change the values of m to be more directly between a and b to see if that helps the success rates to be more similar between the two problems.