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ENCE627

FEASIBILITY STUDIES FOR ALEXAN VIRGINIA CENTER

Fall 2002

Course Project Presentation

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Presentation Overview:

1. Overview on VA Center.
2. Definition of Decision and Chance Nodes.
3. Implementation of Tree.
4. Conclusion.

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Overview on VA CENTER

1. This is a 7.37 acres site.
2. Total budget is $75,450,000
3. Starting date April 23rd, 2001
4. Anticipated finish sep 1st, 2003
5. Project is slightly behind schedule.
6. Money wise, project is within budget so far.

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UNIT MIX

Qty	Bedroom	Bathroom	Additions
193	1	1	N/A
43	1	1	LOFT
5	1	1	DEN
174	2	2	N/A
3	2	2	LOFT

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VA CENTER OBJECTIVE

Obtain money!

MY OBJECTIVE

Study the GO/ NO GO decision

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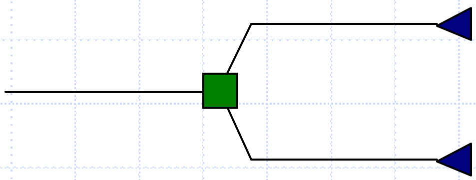
INTRODUCING DECISION AND CHANCE NODES

GO/ NO GO DECISION NODE

They have $18,500,000 that they can invest in the VA CENTER or in a savings account for 15 years and get a flat 2.5% interest rate.



SOFT COST DECISION NODE

GROUP	COST		GROUP	COST
Arch1, Civil 1	$ 5,703,204.0		Arch2, Civil 1	$ 5,784,349.2
Arch1, Civil 2	$ 5,813,441.2		Arch2, Civil 2	$ 5,894,586.4
Arch1, Civil 3	$ 5,923,678.4		Arch2, Civil 3	$ 6,004,823.6

ARCHITECT, ENGINEER PERFORMANCE CHANCE NODE

Small talks with 3 PM's

Assumptions for distributions:

1- They should have a known Min & Max

2- They should be continous

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Group	Distribution
Arch1, Civil 1	Beta general (.63132,1.5937,8808.8,240625)
Arch1, Civil 2	Beta general (.62213,0.63641,4584.6,178654)
Arch1, Civil 3	Uniform (1455.1,160642)
Arch2, Civil 1	Beta general (.35364,.80267,9962.7,142176)
Arch2, Civil 2	Beta general (0.93128,0.98251,2114.4,122386)
Arch2, Civil 3	Uniform (3117.8,100460)

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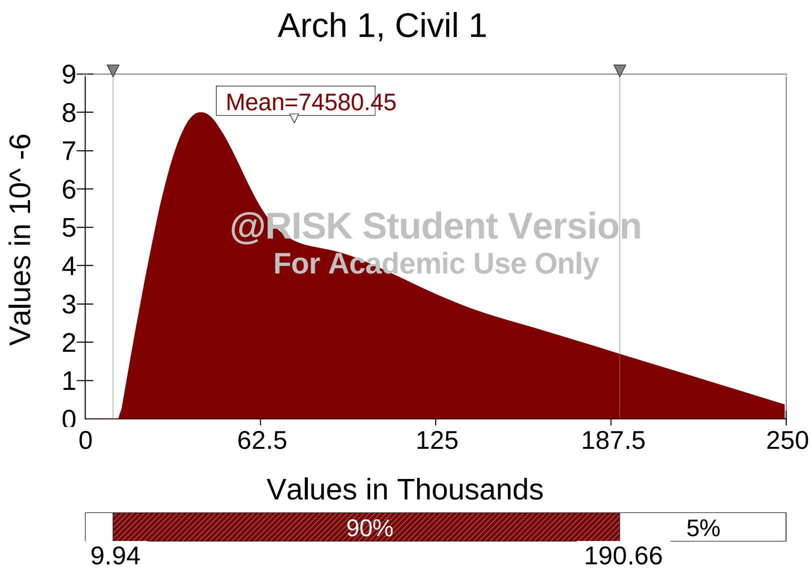

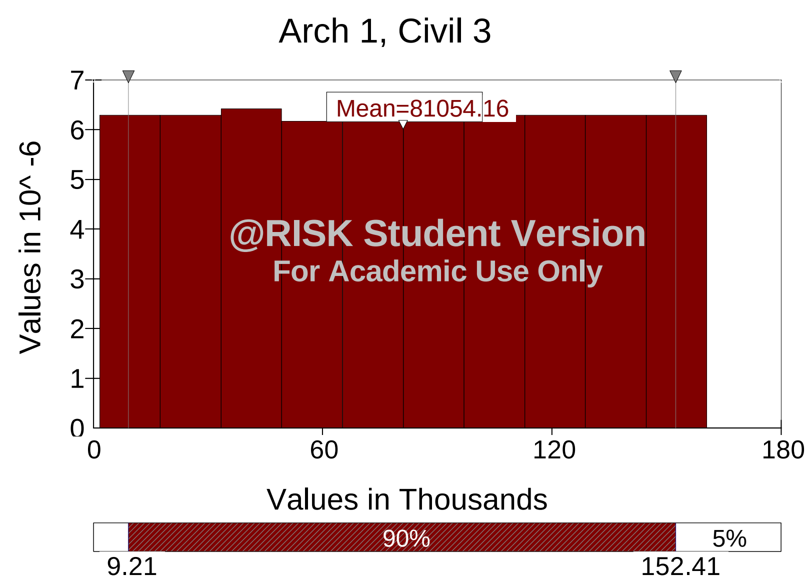

CONSTRUCTION SCHEDULE DECISION NODE

- Three type of schedule is available
- Each one has it’s own cost and duration
- Each one has it’s own uncertainty

Construction Schedule Table

Schedule	Most likely Duration	Cost
Crashed	20 months	$ 53,234,510
Normal	27 months	$ 49,304,100
Slow	31 months	$ 48,559,250

Construction Performance
Chance Node

Construction projects are never on schedule!

There is a chance to be behind or ahead schedule

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Construction Schedule	Min (month)	Most Likely (month)	Max (month)	Distribution
Crashed	19	20	23	Triangle (19,20,23)
Normal	25	27	29	Triangle (25,27,29)
Slow	32	32	34	Triangle (32,32,34)

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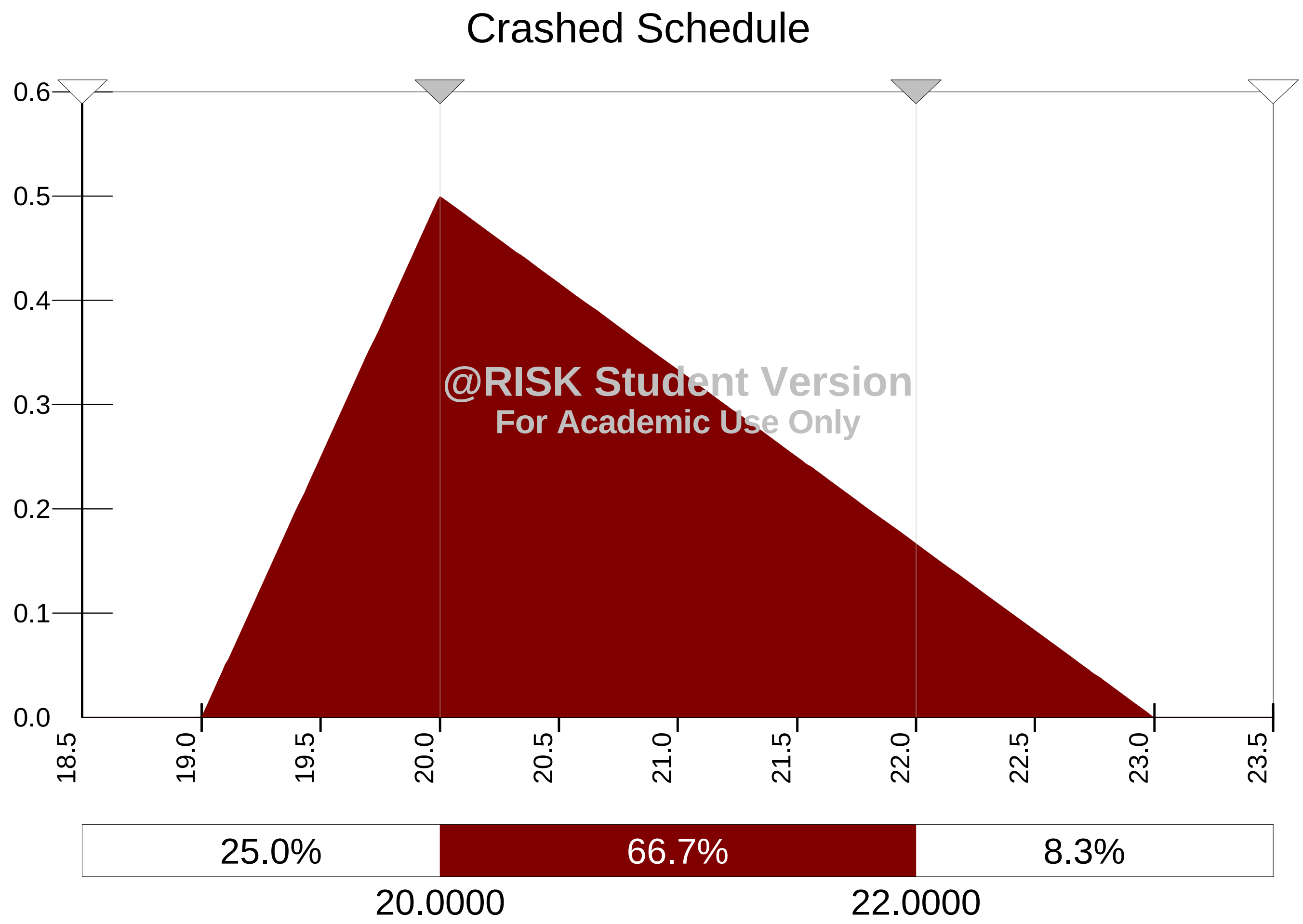

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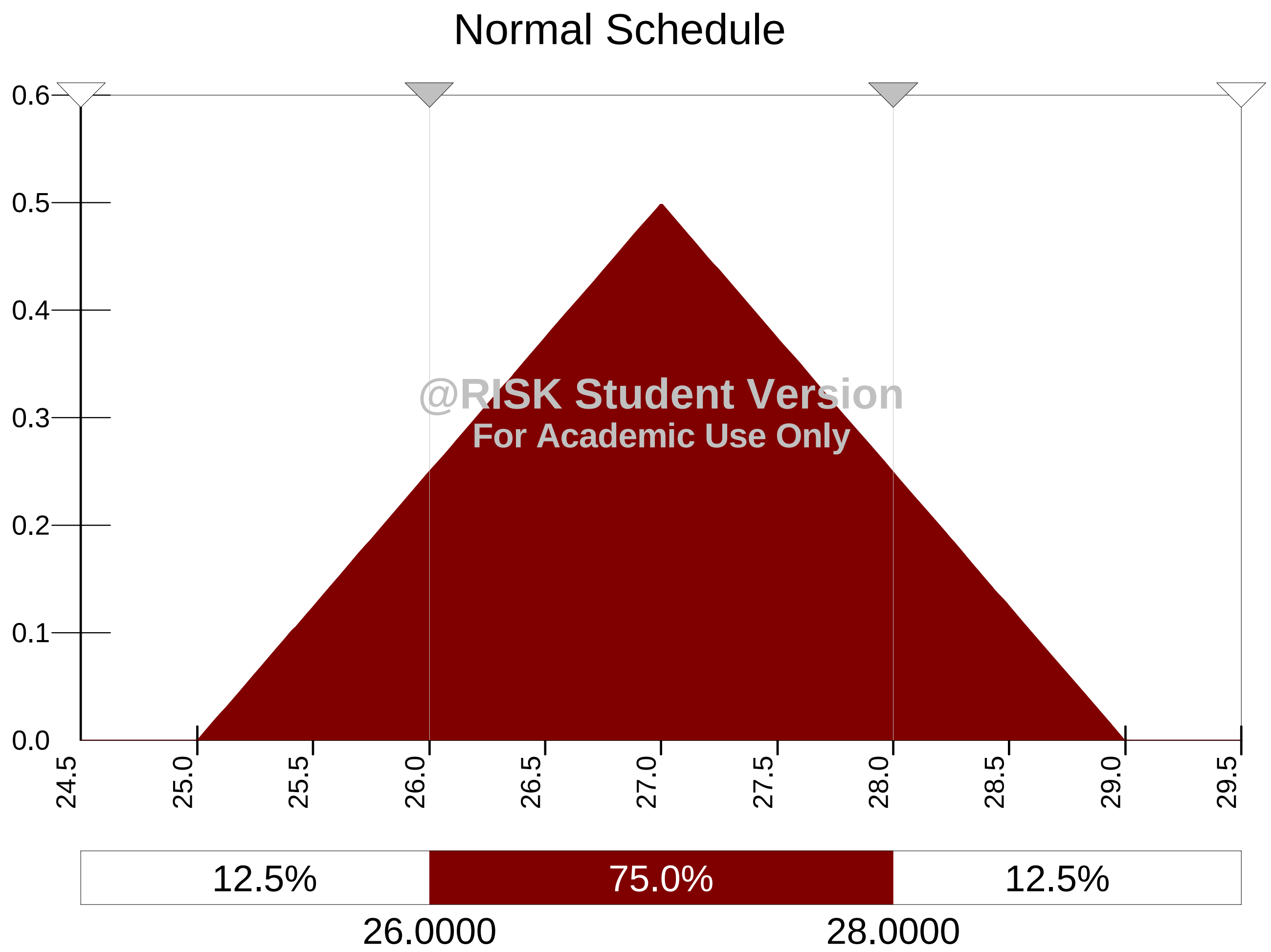

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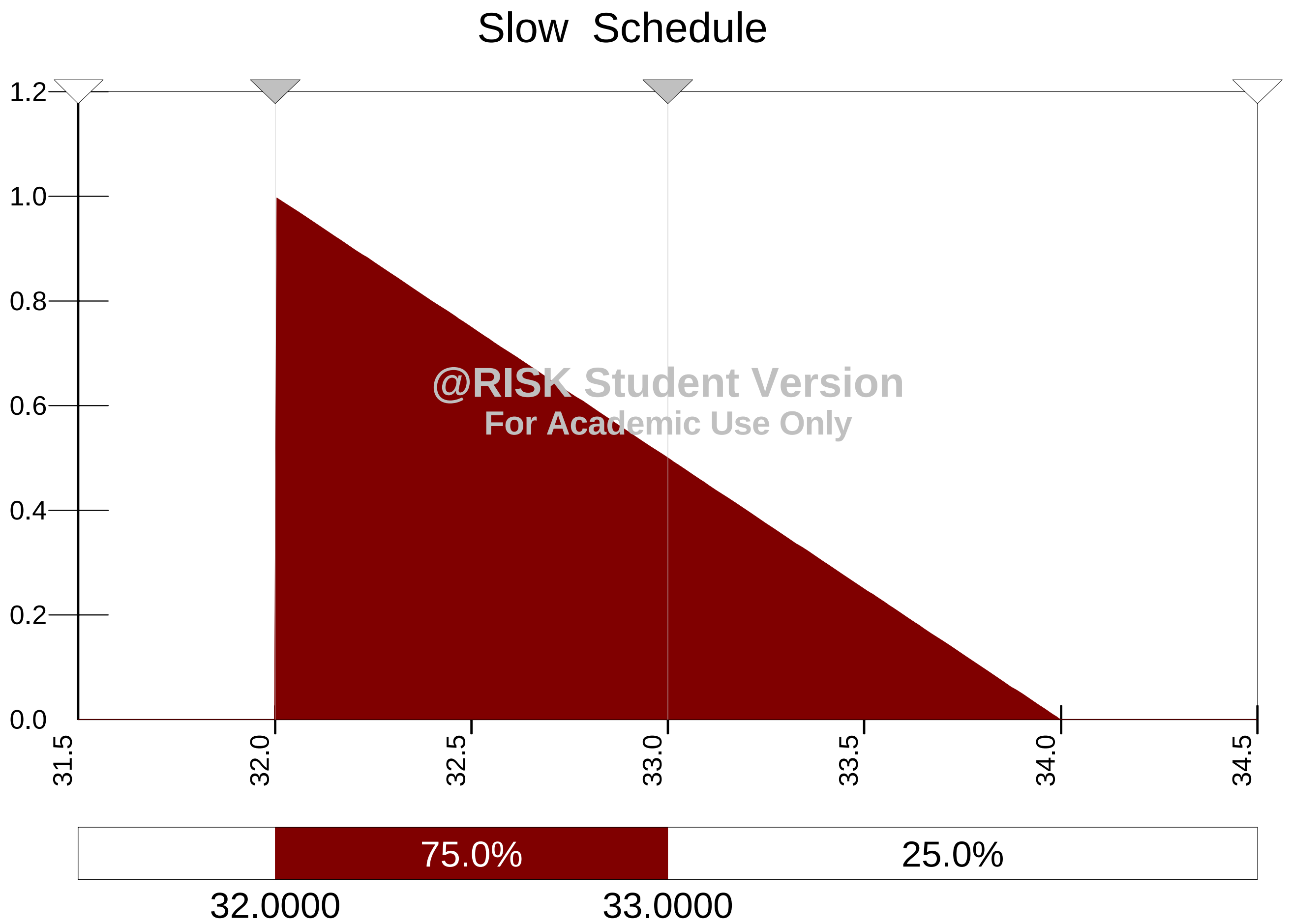

PENALTY

There is this assumption that, for every month that the construction gets delayed there is an additional cost of $500,000. This is both for “General Conditions” and also “Field and Home Office overhead”.

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FINANCING

Assumptions:

1- Construction loan comes with an interest rate of 9.3% and it's calculated for the full year.

2- When the construction is complete, company applies for another loan with rate of 5.3% and pays off the new one.

INCOME

Assumptions:

1- After one year of construction club house and finished units will be turned in and leasing starts.

2- Each month new units will be leased.

3-Average base monthly rent is $1531.

INCOME

Assumptions:

4- 10% of the income is allocated for property management services.

5- Rental fee will increase for 3.5% every year.

6- Final judgment is based on net present value. (NPV)

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IMPLIMANTATION

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First I tried simulating the decision tree.

Did not work because @risk never tells you which scenario has been selected in each iteration. (Or at least I couldn't use @risk in a way that shows the chosen scenario in each iteration.)

So I decided to convert the continuous distributions to the discrete ones!

For example:

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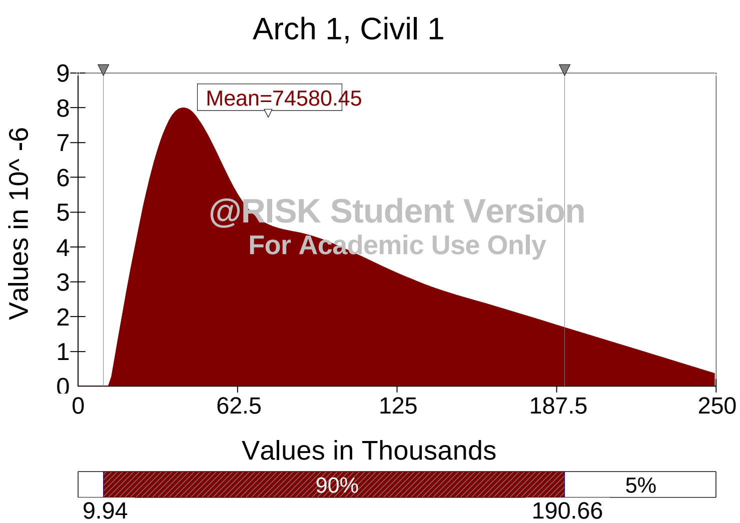

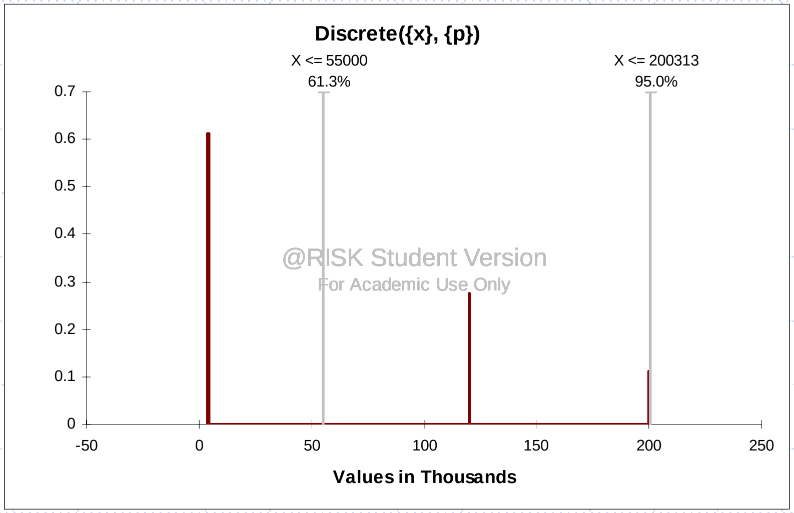

Same thing happened to construction schedule distributions.

For Example:

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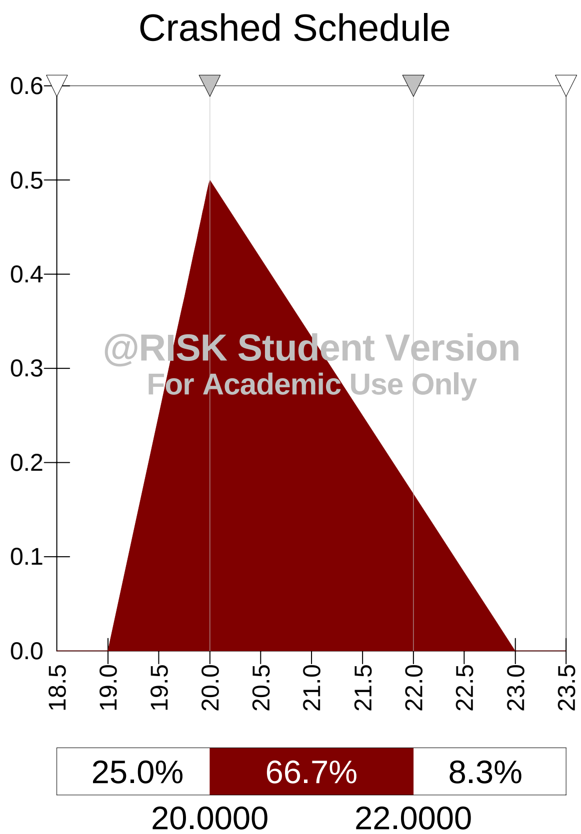

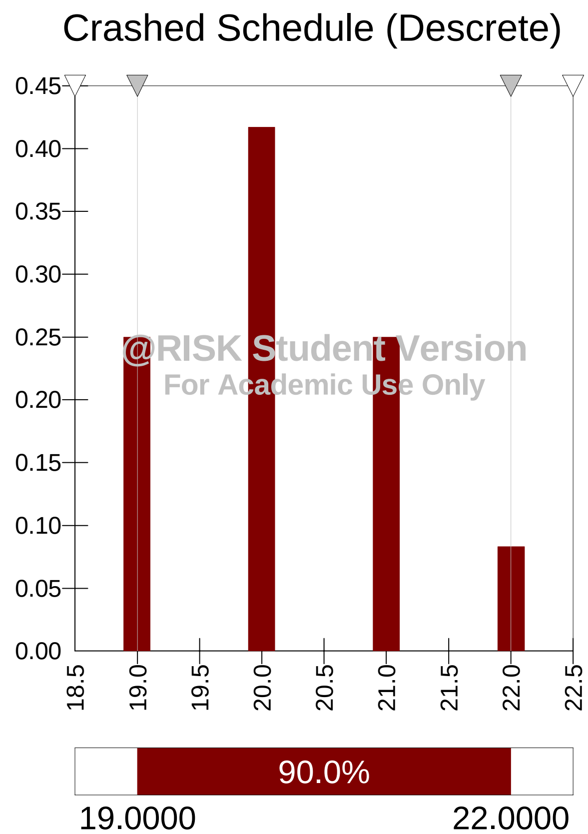

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Now that every node and it's relative value is known I just needed to go ahead and create the decision tree.

BUT I COULDN'T!

Because I reached the capacity of Decision Tree Software (student version)

I had 6*3*3*4=216 branches and it didn't work

As a result I decided to divide it to six trees :

(See the handouts)

Final Step :

Doing the financial analysis and running sensitivity on two possible changeable factors:

1- Base rent values.

2- Interest rates.

Sample Financial Calculations:

Crashed Schedule	
Total cost	$73,482,118.40
Initial investment	$18,500,000.00
Total loan	$54,982,118.40
Year 1 interest	$5,113,337.01
Year 2 interest	$5,588,877.35
Year 1 income	$0.00
Year 2 income	$7,385,833.80
Total Payable	$58,298,498.96

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Loan Payments with 5.3 % Apr.

	Loan Calculations		
year 3	$58,298,498.96	$8,000,000.00	$52,964,319.41
year 4	$52,964,319.41	$8,000,000.00	$47,347,428.34
year 5	$47,347,428.34	$8,000,000.00	$41,432,842.04
year 6	$41,432,842.04	$8,000,000.00	$35,204,782.67
year 7	$35,204,782.67	$8,000,000.00	$28,646,636.15
year 8	$28,646,636.15	$8,000,000.00	$21,740,907.87
year 9	$21,740,907.87	$8,000,000.00	$14,469,175.98
year 10	$14,469,175.98	$8,000,000.00	$6,812,042.31
year 11	$6,812,042.31	$6,812,042.31	$0.00

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Net Present Value Calculations (10% Yield Rate)

Year	Gross Income	Management Expense	Loan Payment	Net Value Each Year	Net Present Value
1	($58,298,498.96)			$0.00	$0.00
2				$0.00	$0.00
3	$9,039,024.00	($903,902.40)	($8,000,000.00)	$135,121.60	$101,518.86
4	$9,355,389.84	($935,538.98)	($8,000,000.00)	$419,850.86	$286,763.78
5	$9,682,828.48	($968,282.85)	($8,000,000.00)	$714,545.64	$443,676.62
6	$10,021,727.48	($1,002,172.75)	($8,000,000.00)	$1,019,554.73	$575,512.07
7	$10,372,487.94	($1,037,248.79)	($8,000,000.00)	$1,335,239.15	$685,188.81
8	$10,735,525.02	($1,073,552.50)	($8,000,000.00)	$1,661,972.52	$775,322.45
9	$11,111,268.40	($1,111,126.84)	($8,000,000.00)	$2,000,141.56	$848,255.27
10	$11,500,162.79	($1,150,016.28)	($8,000,000.00)	$2,350,146.51	$906,083.22
11	$11,902,668.49	($1,190,266.85)	($6,812,042.31)	$3,900,359.33	$1,367,052.15
12	$12,319,261.89	($1,231,926.19)	$0.00	$11,087,335.70	$3,532,766.84
13	$12,750,436.05	($1,275,043.61)	$0.00	$11,475,392.45	$3,324,012.44
14	$13,196,701.31	($1,319,670.13)	$0.00	$11,877,031.18	$3,127,593.52
15	$13,658,585.86	($1,365,858.59)	$0.00	$12,292,727.27	$2,942,781.17
			Total Net Present Value		$18,916,527.19

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Conclusion and Comments:

1. Up to this point all six trees are built
2. Financial analysis are under execution.
3. I like to try another method that I can actually use simulation (Maybe using formulated expected values, @Risk and MS Excel.)

ANY COMMENTS?