

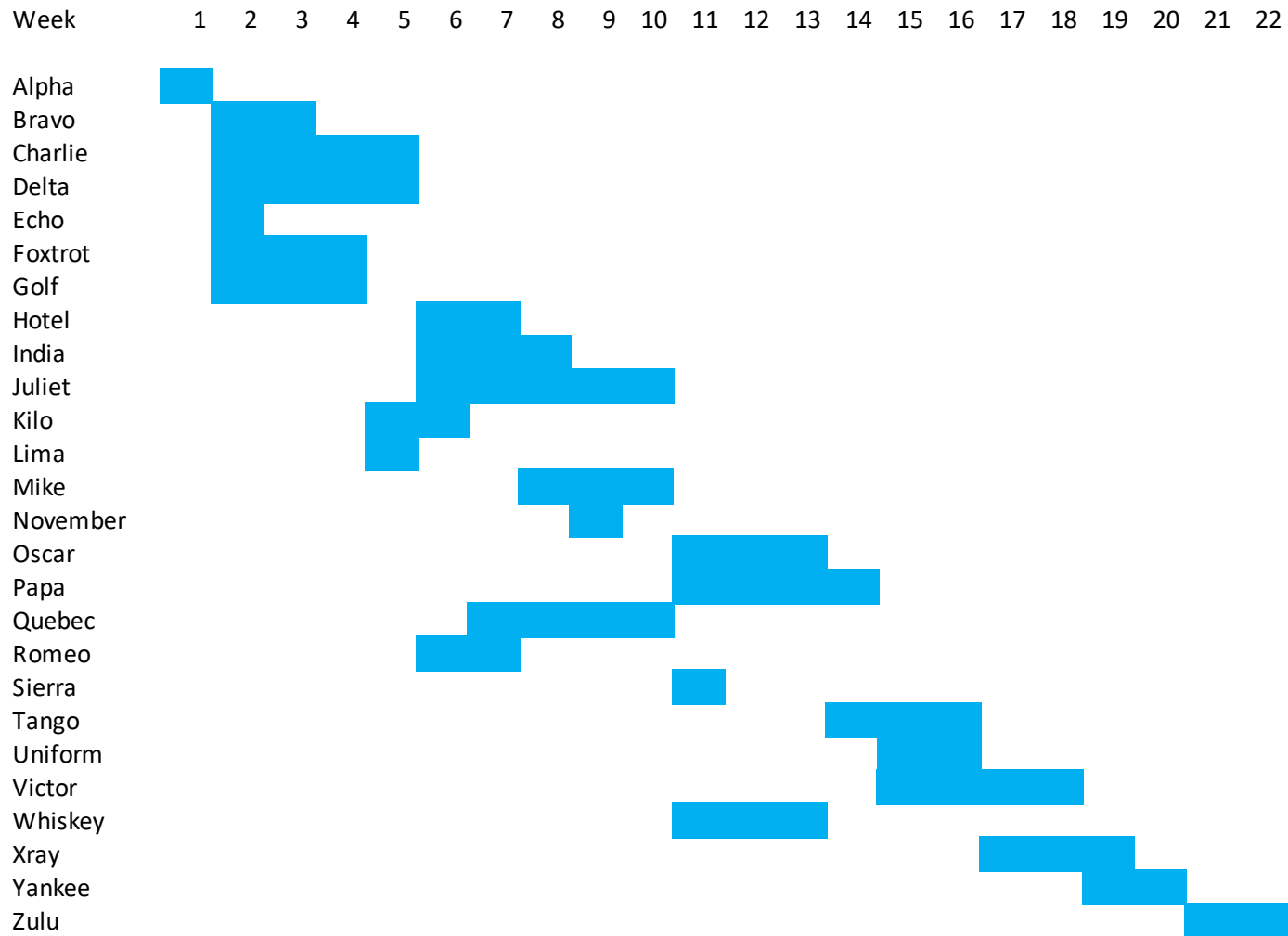
ENAE 483/788D LECTURE #02 (SYSTEMS ENGINEERING) – FALL, 2021

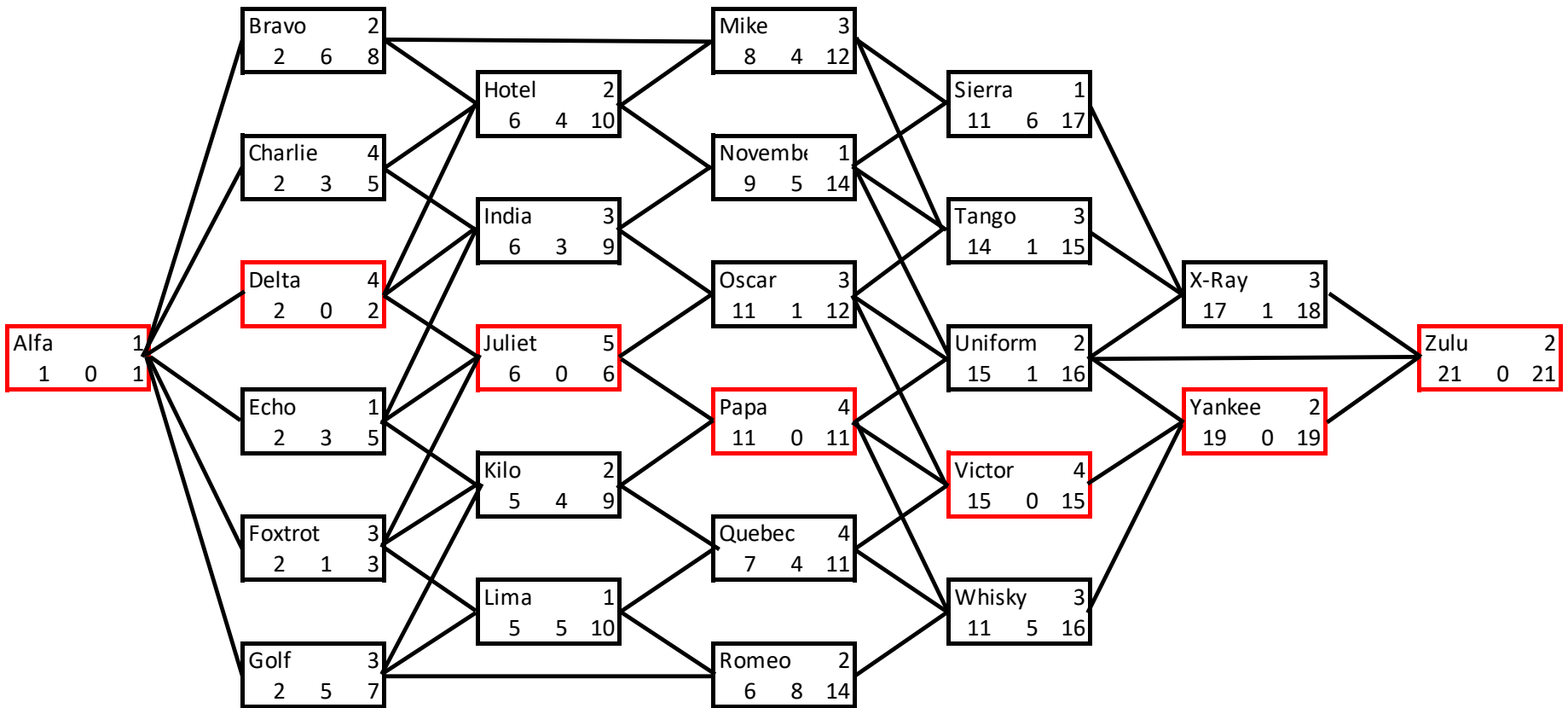
The following tasks describe a project which you need to analyze and manage. Task durations are given in weeks; assume the project starts at Week 0 (i.e., Alpha will be done at the end of Week 1).

Task	Precedent Tasks	Duration (weeks)
Alpha	-	1
Bravo	Alpha	2
Charlie	Alpha	4
Delta	Alpha	4
Echo	Alpha	1
Foxtrot	Alpha	3
Golf	Alpha	3
Hotel	Bravo, Charlie, Delta	2
India	Charlie, Delta, Echo	3
Juliett	Delta, Echo, Foxtrot	5
Kilo	Echo, Foxtrot, Golf	2
Lima	Foxtrot, Golf	1
Mike	Bravo, Hotel	3
November	Hotel, India	1
Oscar	India, Juliett	3
Papa	Juliett, Kilo	4
Quebec	Kilo, Lima	4
Romeo	Golf, Lima	2
Sierra	Mike, November	1
Tango	Mike, November, Oscar	3
Uniform	November, Oscar, Papa	2
Victor	Oscar, Papa, Quebec	4
Whisky	Papa, Quebec, Romeo	3
Xray	Sierra, Tango, Uniform	3
Yankee	Uniform, Victor, Whisky	2
Zulu	Uniform, Xray, Yankee	2

- (1) Draw a Gantt chart for this program. You can use project management software if you have it (several are available for free online) or draw it manually.
See attached figure.
- (2) Draw a PERT chart for this program. Again, use whatever software or manual techniques you choose.
See attached figure.
- (3) What is the minimum time (in weeks) it will take to complete the project?
22 weeks

- (4) What is the critical path?
Alpha-Delta-Juliet-Papa-Victor-Yankee-Zulu, shown by red box borders on the PERT chart.
- (5) Which task has the most slack time, and how much does it have?
Romeo, 8 weeks
- (6) Consider the five project concepts for ENAE 484: a Mars Moons Exploration Vehicle ("Mars"), Outfitting Deployable Habitats ("Hab"), a Power Utility Package ("PUP"), a Suitport Logistics Module ("Suitport"), and a large-scale Space Settlement ("Settlement"). List your order of preference for these missions from most favorite to least favorite.
- (7) Respond to the following ten questions. The allowable answers are (strongly agree), (agree), (neither agree nor disagree), (disagree), and (strongly disagree)
- (a) I prefer Mars to Hab
 - (b) I prefer Mars to PUP
 - (c) I prefer Mars to Suitport
 - (d) I prefer the Mars to Settlement
 - (e) I prefer Hab to PUP
 - (f) I prefer Hab to Suitport
 - (g) I prefer Hab to Settlement
 - (h) I prefer PUP to Suitport
 - (i) I prefer PUP to Settlement
 - (j) I prefer Suitport to Settlement
- (8) Use the solution method for the Analytical Hierarchy Process outlines in the lecture to to an AHP analysis of your own opinion on next term's project themes. and list the resultant weightings on your opinions. Does it correspond to your subjective rankings above? Did the result surprise you in any way?
There's no "right answer" here, just an opportunity to get some experience doing an AHP analysis. How did it compare with your assignments for 484?





Task name		Duration
Earliest Start	Slack Time	Latest Start