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|  | **Timespan** | **Content** |
| 1 | 0:00.0 - 0:49.8 | P1: Female, P2: Female  ===============================================  P1: so first we should discuss about how the views should looks like.  P2: okay.so we have the functional requirements here. that we would have underline. so we can start noting down the functional view first I guess.  P1: yeah, so which function, which view do we have . we should do.  P2: functional, and information, and development.  P1: ok.  P2: so I think development will be the last one. first we make the functional view deciding what all we need. and then what all information we have or what all information we will get in the information viewpoint and then last we can decide which module and how the structure of the module will be.  P1: yeah. good idea. |
| 2 | 0:49.8 - 2:29.5 | P1: and we have look into the text again.  (reading).  P2: so here is the requirements.  P1: for example the traffic signal timing. what does it mean exactly. maybe how long traffic light is green.  P2: yeah  P1: okay. so this could be a function. function traffic signal timing.  P2: okay. yeah ok you right. function traffic signal timing.  P1: so the user. or the student can customize this timing.  P2: okay. and this we will .this function for the timing will be called for the red part, the green part, and orange part. each of those will call this function.  P1: yeah. we can also make sub function like they can alter green light differently as the red light, so maybe the red light is longer than the green light. or.  P2: red light longer will be depend on . yeah if there's the other direction has more traffic then the red light in this side will be longer.  P1: yeah.  P2: if the sensor says there is more traffic on the incoming side then the green light had to be open longer |
| 3 | 2:29.5 - 3:15.0 | P2: and I think for the orange light maybe we don't need a separate calling of the timing function .because it is just in the gap between the red and the green.  P1: so it's more like a fixed time.  P2: yeah  P1: maybe the user can also customized this when he.  P2: green. yeah. so if we are calling the function for the red thing and then before there is actually making the light red holds for say 15 seconds at yellow, same for the green. before turning green it holds for 15 seconds and becomes yellow I guess.  P1: yeah. for example yes. |
| 4 | 3:15.0 - 4:05.9 | P2: so. okay this is one function. and another function is probably the map. it has to call the map like with most recent data of the map and the traffic stated and everything.  P1: ok. then map like creating a street.  P2: we can import that from the Google map right.  P1: but should it be a function. map function sub function like creating a street because there you just said should map of an area. laying out road. pattern. so student must be able to create map. and this the map. yeah. |
| 5 | 4:05.9 - 4:56.5 | P2: so he create a map from scratch or does he just imported from an external source like Google maps or satellite images or something.  P1: I think the students can create. should create individual map.  P2: okay fine . so you have the function for the time. and the function for map creation.  P1: and now sub function of map creation is like creating different streets with different length.  P2: okay. and what about the traffic flow in each street that input has to come from. it said there's some sensor. the sensor should tell.  P1: oh yeah of course. that's good idea sensor. should be in that map or should be . |
| 6 | 4:56.5 - 6:05.5 | P2: and also. see. this point c has the sensor that detect whether any car are present in any given lane.  P1: yeah. and I think when a student can create a map. he can create streets and he can decide where the intersection is and then he has additional opportunity to decide whether there is a sensor or not.  P2: oh ok.  P1: so we can create. so in that map we have sub function creating street and creating intersections.  P2: yes street and intersection is under the map creation .  P1: but two different sub functions.  P2: and I think the traffic flow or like the volume of traffic or direction of traffic can be the third function.  P1: yeah that also good.  P2: because the map creation will be more like static once we've created the road will remain the same but the traffic flow needs to be updated every minutes or something. |
| 7 | 6:05.5 - 6:44.5 | P1: how do we called it. traffic volume or.  P2: flow or something.  P1: is it different functionality is it in. as the sub functionality of map.  P2: maybe not because I think the map once you created will remain the same. I mean. when ever we change the traffic light or the signal we will not be creating new street .will we ?  P1: okay. okay. I see yes.  P2: so I think the traffic flow function will be called very frequently and the map function will be called only when someone is setting up the traffic light for that signal.  P1: okay  P2: I think. I don't know. |
| 8 | 6:44.5 - 7:21.4 | P1: the requirements. when I read it again.  P2: oh yeah  P1: students must be able to create visual map and visual map is different arrangement of intersections.  P2: okay.  P1: so we have that creating intersection. and creating roads and road of varying length.  P2: okay  (drawing)  P1: I added to the creating street with varying length. |
| 9 | 7:21.4 - 8:25.8 | (drawing)  P2: where do the sensor go in the flow function? as a sub function of the flow or?  P1: wait. I. you approach should readily accommodate at least six intersection. so what was your question?  P2: about the sensors, but yeah lets talk about that six intersection.  P1: okay.  P2: so this intersection function should called six times to create six intersection that's it right.  P1: again please.  P2: if we want to create six intersection at least. then we just called this function six times.  P1: yeah.  P2: so we can called even hundred times if you want so at least is not a problem.  P1: this is constraint that student must create six intersection at least.  P2: okay. |
| 10 | 8:25.8 - 9:25.6 | P2: and I was asking about the sensor.  P1: okay. so when show when read that requirement we can see first create a map and second behavior of the traffic lights.  P2: okay.  P1: is a b c should be under that behavior that means the sensor should be under the behavior of the traffic lights. so behavior of the traffic light is another function.  P2: but isn't the timing also behavior of the traffic light.  P1: yeah. maybe we can combine this.  P2: yeah the timing and the behavior. see yeah, we can have some properties for the traffic light function one of them will be the timing. another will be. and the timing will depend on the sensors so they are gonna be together the same module I think.  P1: yeah okay. |
| 11 | 9:25.6 - 10:17.0 | P1: lets read this again maybe we can read something about this. so second functionality is behavior of the traffic lights.  P2: okay.  (reading)  P2: oh and the sensor we should be able to sometimes like use or disable or however they want. it says. that will be a separate module that can be called or maybe we don't call it.  P1: so and this behavior should be customized for each intersection. so at least six times again. |
| 12 | 10:17.0 - 10:59.1 | P2: at each intersection. are we going from both direction because I'm little confuse what that (inaudible) it says no one way road.  P1: ok yeah.  P2: so what does that mean? both are going both way at each intersection we will have like say this is the intersection then you have coming from this side coming from that side any road.  P1: yeah. maybe that's a constraint when this students create streets. I guess.  P2: okay. should be property of the street, make sense |
| 13 | 10:59.1 - 12:31.7 | P1: only T .  P2: T is not allowed. only for.  P1: so behavior of the traffic lights.  (drawing)  P1: variety of sequences and timing schemes. but what is difference between variety of sequences and timing schemes. timing schemes means. okay. intersection one has green light light phase for about 10 seconds red light about.  P2: I know what sequence mean than. see if this intersection one this is intersection two . so say when traffic is going in this direction. if this has been green for 10 seconds, then this should turn green maybe after 10 seconds so when the traffic reach zero they can go through or something so they should be like synchronous you know. so the green light should come on in sequence. because see if this also green and this also green at the exact same time then by the time people reach the second intersection this would have turn red. so no point having both of them green at the same time. |
| 14 | 12:31.7 - 13:20.1 | P1: but is it variety of sequence or timing schemes.  P2: well timing is this 10 seconds for each individual signal that is the timing. and sequence is like first this signal turns green then after certain gap the second signal turns green something like that.  P1: okay so we have that sub. so it could a sub functionality of that functionality behavior.  P2: behavior.  P1: so variety. sequence.  P1: ok  P1: and times scheming.  P2: but time scheming just call this function they already have function for that too.  P1: okay. so I called timing schemes. |
| 15 | 13:20.1 - 14:24.2 | P1: okay so it's about color phases. okay.  P2: this we have two.  P1: yeah. then we have an addition .  P2: oh left hand turn. I don't really understand what that means.  P1: yeah. because when you have a street and car wants to turn left you have to cross the other side of the street and that's. yeah. you have to make sure. that from the other direction no cars is coming.  P2: ok  P1: so you need that right. you need that left hand green arrow lights.  P2: left hand green arrow yes and at the same time the sequence will be that from the opposite direction should be red. those two should be match together.  P1: okay. I should write it down somewhere. because that's good. |
| 16 | 14:24.6 - 14:43.8 | P1: but where on the which.  P2: in under the sequence probably this is one of the sequences.  P1: okay so property of sequence.  P2: if left hand arrow is on. |
| 17 | 14:43.8 - 15:03.2 | P2: then opposite direction should show like. incoming oncoming traffic should be stop. like this should be red on the opposite. I think. |
| 18 | 15:03.2 - 16:22.3 | P1: okay. when creating intersection. oh when you do decide to make the left hand arrow or make normal one or make sensor.  P2: well that should be like. see it might have two lanes so car who want to turn left this wait in the left lane. so if the sensor can sense that there are maybe three cars waiting to turn left.  P1: yeah  P2: then the left side arrow comes on.  P1: okay. but the user can decide this when he creates intersection.  P2: yeah  P1: so we can have different opportunities for user. when he creates intersections.  P2: so like different traffic lanes. in the property of the intersection.  P1: what.  P2: like lanes. you know. you have like left lane for. like the people who just wanna go straight stay in the middle lane or the right lane. and people who want to turn left. say you wanna turn left here. then you stick to the left side of the road. and the sensor here will detect that ok. that so many cars are waiting. if there more than three cars waiting. then you turn on the left side arrow and stop that traffic from the front. |
| 19 | 16:22.3 - 17:56.0 | P1: okay. but I. that's good. but I want to know. when you create intersection. the students create intersection and then he can creates a traffic light. and then he can decide if he wants to make the traffic light on the right side on the street or on the left side of the street. should that be a possibility for the student to decide where the traffic light is.  P2: oh yeah that would make sense. in street that really wide or something.  P1: is it a must?.  P2: I think I see that they have. I think they have traffic light on both side here.  P1: yeah. because you need that left side arrow and .  P2: for the right side is free turn I think. for the right side you don’t need an arrow.  P1: yeah. that is right. but. when you create intersection is it a must to create also traffic light.  P2: yes.  P1: okay that could be a sub function of creating intersection. that also have to create traffic light.  P2: yeah.  P1: but that should be different functionality. because you have.  P2: yeah so this creating traffic light function should be able to called when we creating the map, and we creating the street.  P1: okay that is good.  P2: so make that a separate function that we can call. I hope this recording. okay |
| 20 | 17:56.0 - 19:59.0 | P1: ok mine is not recording.  P2: oh mine is recording it's fine. why is not recording.  P1: because it was in a. it was shut down I guess.  P2: as long as it's recording.  P1: so creating a traffic light. so which of opportunities do the student have ?. so he can create right side. no. left hand green arrow light.  P2: yeah. left hand green arrow light. straight.  P1: normal.  P2: yes. which is straight I guess straight green . see the left side thing will be blank. it'll come on only when it's green we don't normally show a left side red arrow or something is just gonna be blank when you are not free to turn left right.  P1: yeah but it's additional opportunities I guess. because not every street you have that left side arrow. because normally traffic light consists of red, orange, and green . and that left side arrow is an addition. so when the students want to create traffic light. maybe it's only additional.  P2: but I think if all the intersection are four way intersection then we will have that. unless it is like a pedestrian crossing like a human crossing in the middle of the road. then you will have traffic light that don’t show left or something. but if it is in a four way. in a junction then we will always have a left turn.  P1: yes. how to model it.  P2: I'm gonna stop and do the recording again |
|  | **Timespan** | **Content** |
| 1 | 0:00.0 - 1:47.2 | P1: how do you call it. a decision. so create traffic light and the system ask the student do you wanna create.  P2: left turn. yeah.  P1: normal one or. yeah. should it be a right side one or left side one.  P2: okay  P1: because the right side one is the normal one which only three light.  P2: ok yeah. make sense.  P1: yeah when the students decide to create a left side. the system should be able or should given notice that the constraint is to create red one on the other side.  P2: yeah. but it should do that automatically that shouldn't be left to the user I mean if the user selects that left turn. but that will be at the timing under the timing function I think. because that's the synchronous of the timing. but okay. and little bit of the sequence also variety of the sequences. because see it should not be. it should not be left to the users to specified that the opposite side should turn red. that should happen automatically . if this is going green then no matter what the opposite side should turn red because other wise it will be a crash.  P1: yeah ok.  P2: so it's not an option it will be and AND condition. |
| 2 | 1:47.2 - 3:10.3 | P1: should. been. okay. then come back to the timing schemes.  P2: yeah.  P1: how can we include that. opportunity for the student that he can decide. if they want to go right or left can we model this in some way.  P2: well if they want go left. they should switch to the left lane of the road and the sensor should detect it. I feel. like you know if you wanna go left at that turning. then you start taking the left lane from say 100 meter before that or 15 meter before that and the sensor will detect that. okay so this guy has shift to the left lane and you know and they will know that okay some three four car or whatever some people are waiting on the left most lane that means that someone need to go left. so then if you have sufficient sensor trigger that so many people are waiting on the left lane. then the left signal comes on after sometime. but that can be choice for the student it could display that. you know you have three cars waiting in the left lane so do you wanna turn the left signal on now. have it like that.  P1: okay. that could be. |
| 3 | 3:10.3 - 4:23.7 | P2: I don't know how to put this.  P1: but we only have that option four cross or four ways intersections.  P2: okay  P1: so we always have that situation that someone wants to go left. so should we do this as a default property that each street has three lanes.  P2: yeah okay.  P1: or should we let this to the students that he decides if there should be third lane or is two lanes are efficient. because. that's I think also.  P2: yeah we should definitely have that option because not all street are gonna be so broad street even if it is a four way intersection it could be a small intersection you know.  P1: okay so we have that addition.  P2: of how many lanes we want to have when making the streets on map.  P1: when creating streets. |
| 4 | 4:23.7 - 4:55.8 | P1: so. we have that. when the student wants to create street he can specified if he wants. which length of the street and how many lanes .  P2: yeah.  (drawing)  P1: okay  (drawing) |
| 5 | 4:55.8 - 5:22.2 | P1: yeah and that sensors where can we put this.  P2: well it says that they should have the option to disable the sensor also so it will. so the student can pick that.  P1: ok but.  P2: it will come under the. well I think the sensor will be when we are creating the traffic light. you should have the option that do you want sensor with this traffic light. |
| 6 | 5:22.2 - 5:55.9 | P1: but. this has an effect on the behavior. know. yeah. the sensor has effect on the behavior of that traffic light so.  P2: okay. so. after we finish noting we will note down the properties of the traffic light. like the behaviors. like which property affect which behavior right.  P1: yeah. okay do we have all the function  P2: no. there are four points. |
| 7 | 5:55.9 - 7:45.2 | P2: traffic levels. so that would be taken from satellite images I guess.  P1: what.  P2: like see.it says like how heavy is the traffic in a certain road so normally that data comes from the.  P1: you mean the traffic density or the traffic flow?. because we can make like. functionality stimulate traffic flows and change the traffic density. because that is two different.  P2: okay so let talk the first one first. which is the.  P1: traffic flows so that.  P2: what does that even mean.  P1: so you can decide if.  (reading).  P1: so you have.  P2: oh okay. so basically when they are creating they should be able to see on the map how like we have should have option for showing on the map visually the traffic or whatever what is going. so we don’t need to show individual car but you know like Google map shows like the whole road becomes like red or something if it's caught like a lot of traffic. have you seen that.  P1: yeah.  P2: so we can use that maybe.  P1: yeah. or when we for example we could take petri nets or something similar to model and then you can. you can give the students the opportunity to higher the amount of cars.  P2: yeah. which is in the next point. which is the change traffic density. |
| 8 | 7:45.2 - 8:19.7 | P1: oh yes you are right.  P2: this just to see it just so the user can see it on his console that okay .  P1: so we have to model or we have to give the opportunity to the students to play and to stop the simulation.  P2: yeah probably.  P1: that. so when we have the functionality stimulate traffic flows it should be. a play function.  P2: okay.  P1: so to start the simulation.  P2: okay. |
| 9 | 8:19.7 - 9:24.1 | P2: yeah, or they can. see when they visualizing they can visualize only the street and the traffic light or they visualize with the traffic.  P1: yeah. we have different opportunities so. yeah that's good. so the student can decide you want to. want to. you can decide which intersection timing schemes he want to use maybe.  P2: it just part of the first one.  P1: yeah I'm still on the first part. intersection timing scheme.  (reading).  P1: and update. I can. so .  P2: so the update should get the data from some satellite right.  P1: yeah. or when user make some changes the simulation should stop and then make the update and then start again.so this is also function of that.  P2: yeah. simulation. |
| 10 | 9:24.1 - 10:38.3 | P2: it could also get some input from say like you know. this traffic light which is 500 meter after this traffic light will get that. will get the data that from this traffic light say heavy flow of traffic is coming. so then this will turn green and let everything pass. so you know one traffic light will get the signal from the previous traffic light also. sometimes.  P1: okay. that's like intersection timing scheme.  P2: something like that. something like the sequence or something. but we can have the option that the user.  P1: the option.  P2: yeah. whether you want to take input only from the satellite or do you want take input from the previous traffic signal also.  P1: yeah including. yeah that is good. so may we have so. smaller steps. so option is including to turn on that sensors or turn off that sensor.  P2: yeah okay. also feed back maybe sensor and some kind of feed back. like you know sensor is before the signal went like ok cars are approaching 50 cars they have move on. |
| 11 | 10:33.3 - 11:29.2 | P2: but than that the fact that 50 cars have cross this signal A maybe signal B should be able to get that information before that 50 cars reach the second signal.  P1: that's a good idea or when there are no cars in front of traffic light it should turn to red.  P2: okay.  P1: and then other traffic light should turn to green.  P2: yeah. when all the cars have gone from this then it can. yeah then. there are no cars then it can allow the flow in some other direction so it can become red.  P1: so I have to write it down so including options to turn on and off the sensors and to make other traffic light sensitive to that signal.  P2: feedback.  P1: feedback sending okay. |
| 12 | 11:29.2 - 13:19.5 | P2: and also satellite data I'm guessing.  P1: should. yeah. satellite data should be.  P2: would be part of the update.  P1: update means that when the students make some changes.  P2: okay.  P1: then the simulation should adapt this changes so when the students decide to .okay. he want to turn off the sensors. it should be updated in that simulation and run it again.  P2: okay.  (writing)  P2: I think when ever we play the simulated traffic flows at the time it self there'll be satellite update.  P1: but when do we need that satellite because it's only a simulation. what do you mean.  P2: like you know anytime you say you want to see you running the program and you want to see the flow of traffic immediately you have to get the data from the satellite other wise you can't see anything.  P1: but you make that input. you create that input for that model.  P2: oh okay.  P1: so it's not real time. yeah it's should simulate real time. simulation.  P2: okay let just keep as the one of the input that is fine.  P1: okay. so what else do we have.  P2: but do you put the satellite thing. so yeah so we can have three of input, one is the feed back, one is the sensor, one is the satellite. it's fine |
| 13 | 13:19.5 - 14:33.9 | P2: oh and does the traffic control department of the city or town so they also send some input.  P1: I don’t think so. I think we should leave it like this. easy one.  P2: okay that's fine.  P1: so now to the traffic density.  (reading)  P1: so that isn't traffic we can. make this as functionality?.  P2: property. ok lets see density will be a property but changing the density will be of functionality. okay. so we should have the option of diverting all the traffic to a particular road and making it a busy road I think. right.  P1: yeah. so you can change it. and option are busy road.  P2: yeah here it says. busy road or seldom use road or anything in between. |
| 14 | 14:33.9 - 15:05.7 | (drawing) |
| 15 | 15:05.7 - 15:43.0 | P2: I think we have all the requirements now. and the properties.  P1: yeah. okay.  (drawing)  P1: okay. this is the functionality. so we have the map functionality. behavior of the traffic light functionality.  P2: ok  P1: third is simulate the traffic flows. and the fourth is to change the traffic density.  P2: okay great. lets work on this four. how many. |
|  | **Timespan** | **Content** |
| 1 | 0:00.0 - 1:31.7 | P2: so yeah if it's like peak hour or office hour college hour then will be heavy traffic. but if we seen in the middle of the night or something then see we a lot times the signal is not red or green they just go blinking yellow. because you know. you just suppose to look and then decide for your self and how you want to go.  P1: should we make opportunity ? or the option for the user to decide whether they or .  P2: well heavy traffic period or light period is at least would say.  P1: so the user are able to turn off all traffic light.  P2: that might be due accident. but I don't know.  P2: yeah. but in the night. yeah in the night when ever I go I see it just blinking orange all the time it doesn't red or green unless it's really big main road.  P1: yeah. we can . put this to the function.  P2: we can have for each of the traffic light we can see whether during less rush hours whether we want to make it like. you know. like not functioning with full capacity or something.  P1: yeah.  P2: we can choose it like we don't have to do it for all the signals but for the smaller ones sometimes we can just select that option.  P1: okay turn off certain.  P2: yeah limited functionality or something like that. |
| 2 | 1:31.7 - 2:32.2 | P2: yeah. say like it's at that time when there are no buses going in that direction or something then the rules can be little relax for the cars.  P1: yeah.  P2: you know they can go into the bus lane maybe.  P1: yeah. okay when the user want to play. I think it's good option for him to choose the time speed.  P2: okay.  P1: so he can see one hour and five seconds. or one week and five seconds something. to regulate the time speed.  P2: yeah.  P1: is it more playing or should it be.  P2: no it just a visualization option it's not actually changing the speed of the traffic or the road he just seeing on his monitor the different speed however he wants.  P1: yeah. changing speed. |
| 3 | 2:32.2 - 3:05.7 | P2: yeah when you play you can have it play at the real time speed or played at like you know. like review speed which it will be faster or something. because he seeing like if he want just view the night traffic then half the time the road are empty he doesn't have to sit and see every minute of it. he can just fast forward it and see the whole five six hour and maybe half hour or something.  (drawing) |
| 4 | 3:05.7 - 4:29.3 | P1: but. what does so. now to the fourth functionality. traffic density. what does it. how does it effect the system when the user changes the street to busy road. how does this effect the system like more the capacity. well. more cars.  P2: time will be longer for signal green will be open for longer I guess like you know. if it's a busy road.  P1: no I think that can user decide how long the traffic light is. but when the road is busy how is that show. I think when you higher the amount of cars per minute.  P2: you mean how we measure it.  P1: yeah. yeah. how we measure. that's good. maybe we should write it down  P2: yeah. we should have some parameter.  P1:more cars per time or.  P2: and also maybe something to do with heavy vehicle like bus or something. busy street has more bigger vehicle also.  P1: okay. |
| 5 | 4:29.3 - 5:27.7 | P1: but the system will decide this. or when the user decide busy road the system add more huge cars.  P2: yeah. then the system will put provision for say that two buses can go side by side. you know. like we have here in the evening at five o'clock if you see five or six buses go after one and another and the traffic light doesn't stop them it lets them all go and becomes red for other stuff I guess. okay lets start modeling this view other wise we will run out of time.  P1: or we should discuss the other. only draft version of the other views and the model it.  P2: oh this was only for functional view.  P1: yeah. so we should do the context view I guess that.  P2: do we have to do the context view.  P1: yeah.  P2: no. functional, infor and develop you say.  P1: where is it. |
| 6 | 5:27.7 - 6:36.3 | P1: context, functional, and information.  P2: sorry so not development view.  P1: yeah good.  P2: that's okay we don't need that. okay so context first. we have the functional thing more or less.  P1: context so we have user. the student.  P2: okay.  P1: I have some some idea we can. the we have the application or the system maybe.  P2: okay and we have external data sources like satellites and internal data sources to the system like other traffic lights and sensors. so put some data sources I guess.  P1: okay.  (drawing) |
| 7 | 6:36.3 - 9:04.6 | P1: so we have internal information. or was it like when traffic light.  P2: one is the feedback from that other traffic light and other one is sensors what are internal to the system.  (drawing)  P2: and external is the GPS satellite traffic data.  P1: but maybe the traffic light cannot communicate directly with each other.  P2: they would go to traffic control office or something.  P1: like GPS so maybe that's our only option.  P2: no no no. see what I mean by that satellite data is. it will show actual images of which street is how much crowded or you know the detail of the road will once the user has created the road that data will be store on the satellite. but when two traffic lights are communicating maybe that will. well there will be some traffic control office or something I believe.  P1: yeah.  P2: because see if there say this road and there is a big accident that is happen in the road. then the satellite will not know. the traffic light will not know. but the traffic control office will know. and they will inform and you know they will change the road accordingly there's been an accident on the road, they will block of that road and divert the traffic to some other roads we should have some option for that.  P1: that is good. but I don't really get the idea with GPS. because it's only students using that system. so I can decide as a student how the street are look like or how does.  P2: so if you don't want real time data then we don't need the satellite yeah.  P1: I don't know if this are to complicated for the system.  P2: okay. |
| 8 | 9:04.6 - 9:59.8 | P1: that is good. But how to include this in our application.  P2: we'll just keep it as external data sources and (inaudible) line if they want to refer to more.  P1: but does it changes to the system. what information do you put into your simulation like. when you.  P2: well it will see that at this time this road has this much traffic. which information the traffic light cannot give you. you know. you can see for the whole area or something or each traffic light will have the information of how many cars are only passing this traffic light. but with the GPS you can see with the satellite thing you can see how crowded everything is.  P1: that's for bigger. I think that's good idea for traffic control office. because here we only talk about the student application.  P2: okay |
| 9 | 9:59.8 - 11:09.9 | P1: I think the students. the students create the street. so how can that be a benefit when they have some real time. not real time reality information, because it is not that the big simulation.  P2: okay . yeah fine if it's only the student that are using it then maybe we don't need it . but if we want to sort of related to and a real system and real life.  P1: okay when you want to include that we can make a plug in or something.  P2: Yeah. that can confuse pre required if not we don't use that.  P1: so the benefit for the student is to download the map or what do you think? and then information about the traffic.  P2: Yeah. he can see see like he's impress in this area if you download the map of this whole say whole size area or whole new kind area . |
| 10 | 11:09.9 - 11:24.5 | P2: then he can decide that okay this road is gonna get really crowded in another one hour so I diverted to the other side or something you know. so he distributes the traffic and he opens up this was not a road or something. so he open up or something. |
| 11 | 11:24.5 - 12:14.7 | P1: okay. but I think when we want to model this or to make a plug in would real reality information I think someone should create this system so should be really a plug in or should be already created because we can not create such a system because every traffic like information should be in that simulation how to get that information.  P2: yeah so that plug in could just be Google traffic system or something.  P1: okay  P2: so yeah if required then we can get it from that  P1: Google traffic.  P2:The have something system.  P2: yeah it's fine.  P1: it is plug it. okay |
| 12 | 12:14.7 - 12:53.6 | P2: what the. okay so context view and okay so these are the user this is the input this is the external input and system components. the part of the system here.  P1: yeah. |
| 13 | 12:53.6 - 13:57.9 | P2: traffic light. the traffic or how do you wanna we can make it in two.  P1: maybe we can always make an output on this screen.  P2: yeah. output is what exactly we would see if we were standing at the traffic signal like this signal is red for so long and so long. so that is the final decision of the whole thing.  P1: yeah that is the simulation.  P2: yeah. and some where yes system component were other part of it. the. the decision making module should be something I'm guessing because.  P1: okay. yeah the creating model module  P2: yeah yeah  P1: and the this session module  P2: yeah  P1: but how to align to understand the function now. functionality..  P2: well.  P1: so that's yeah |
| 14 | 13:57.9 - 14:44.1 | P2: the decision model get state back from data source  P1: and creating module.  P2: yeah. creating street view or something. which will be more like a database I guess once he has created it will be like static database. he is not gonna update the street every time.  P1: yes.  P2: but the this decision part will be dynamic depending on the of the date the flow of traffic  P1: how do we show that ? Petrinet  P2: yeah |
| 15 | 14:44.1 - 16:19.5 | P1: yeah. do we have time for that? Petrinet should be I think the information view.  P2: okay. okay Yeah the static dynamic part we can show in information for the context did we miss anything? yeah.  P1: do we have the interface for the user?  P2: yes of course. we always having the best for the user.  P1: yeah like. what is exactly the operating system.  P2: well the application this whole application interfaces I'm guessing.  P1: yeah the GUI.  P2: yeah. just keep it as GUI or application interface it should be fine. okay.  P1: what. what module could you be also simulation. so you create we have creating module, decision module and then after decision you want to simulate this and that.  P2: okay. but isn't that the output. isn't this the simulation thing .  P1: yeah. this. yeah. but in this simulate you can also make some changes. like including sensor a note and then after you made some changes you can see it on the screen.  P2: fine. |
| 16 | 16:19.5 - 17:07.7 | P2: okay. Enough with context information. lets do the information view.  P1: So the information view we can decide oh we should make static and then dynamic. yeah. static is like UML classes I can show you an example. |
| 17 | 17:07.7 - 18:42.8 | P1: so I think information we have some classes for example traffic lights and properties.  P2: okay  P1: or what else roads have some properties.  P2: everything has properties.  P1: yes. or. yes. I think we have a. first we can model traffic lights. So here you can see that this is our information static view. So you have some classes with that attribute.  P2: okay.  P1: and we have some. and we have modules. lets start with traffic light this is a this could be own class traffic light.  P2: okay  P1: traffic light has some attributes  P2: which is not on the (inaudible)  P1: yeah. attributes like has a red light. what does that type is it?  P2: red light and score time right. I mean it'll be like the time for the red light just the red light. time dot red, time dot green. |
| 18 | 18:42.8 - 19:36.3 | P2: and. yeah. and time dot green. yeah.  P1: green light  P2: or should be like red is. what would red be. red is I don't understand and then we could attach the giant property with everything. and then we have green but I don't know what we call green just by itself. I mean just green or just red. red light or green light doesn't really have any use for us I mean we need the time for that right.  P1: yes. I don't know. yeah.  P2: and also the gap time for the yellow light.  P1: yeah. |
| 19 | 19:36.3 - 20:12.3 | P1: yeah but traffic light has also name like traffic light number one, so that is the key.  P2: yes definitely.  P1: name is from type string.  P2: ok time is numerical. or  P1: time is time. yeah.  P2: and even put something as a gap so we can change the gap between the green and the red light.  P1: yeah. so the yellow face.  P2: yeah. okay. |
| 20 | 20:12.3 - 21:25.9 | P1: so then we have that the additional opportunity to make a. we can make it like Boolean. we have that left side arrow.  P2: okay. what you call name Boolean? or should Boolean.  P1: Boolean is a data type with wrong or false.  P2: no which one do you wanna make Boolean.  P1: that left side of arrow is it on or off.  P2: yeah that could be Boolean that's fine. It will have two stages.  P1: yeah. or should we make on the class. like a child class.  P2: no keep it with the red and the other lights there are the same. I get agree if you.  P1: yeah when this. when this the students want to create the traffic lights. he can also.  P2: let see if we're keeping the status on and off. then we should have that for the red and green also. so it's should be red dot stage and red dot time. and state will be Boolean for everything and time will be a time for everything. |
| 21 | 21:25.9 - 22:02.0 | P1: do we need to turn off the red light?  P2: technically yeah when the green light comes on the red is off. because we can't have the red light on at all time so does to go off when the green or yellow or anything is on.  P1: yes. you are right  P2: So when the time for the red light has passed. then the red light goes on the zero stage.  P1: check okay.  P2: So far everything we have state at that time.  P1: yes. red start. and the Boolean. yellow.  P2: I'm gonna do the recording again. |
|  | **Timespan** | **Content** |
| 1 | 0:00.0 - 0:17.1 | P2: yeah. wait not recording. it's been 20 minutes. otherwise it will be one really big. in case we cant send it at least some part will go through |
| 2 | 0:17.1 - 1:42.0 | P1: but we can also make. I have an idea like. this is the traffic light the normal one and then we have the child class which has all that properties from the parent class with an additional property as a left side arrow. so we have two.  P2: so you can just inherit this to the child class I guess that should be fine. I'm not sure how to show inheritance in the diagram but yeah we can.  P1: yeah you can make this like an arrow like this.  P2: okay.  P1: so we have that all properties of the mother traffic light of the normal traffic light and then addition you have that left side arrow. it is on or off and also time.  P2: both those things.  P1: we have left arrow state.  (drawing)  P1: Boolean.  P2: left arrow time.  P1: time  (drawing)  P1: okay so |
| 3 | 1:42.0 - 3:14.6 | P1: we have that. traffic light yes. what else. we have map of static class. map has street .  P2: has to be a class that has so many properties.  P1: that is street also a class.  P2: sub class yeah because on the street again we have lanes busy or not.  P1: but it could be also map contains streets should not be a child class. yeah we can make it like this.  P2: but if we want to disable that street or something then it would be easy to have it like a class or anything.  P1: yeah. street should be own class. okay. not should be not a child class it is.  P2: separate.  P1: yeah. and then the map include some streets.  P2: yeah map can just import as many street as it wants.  P1: ok map has street. street is which type. yes or no maybe or length. no. we can also talk about street. street. but what does street.  P2: it will have length.  P1: yes length is type INT I guess. it's only only a number.  P2: yeah fine. will it have a direction.  P1: yes that's good.  P2: because there is no one way road.  P1: direction. but how to specify this. |
| 4 | 3:14.6 - 4:30.9 | P1: (inaudible)  P2: yeah. we can make it Boolean. and then we can just put our own notation for that saying zero means is going.  P1: yeah probably always true or false. so I guess that it's not a right. or we make left directions Boolean yes.  P2: yes. we can just specify like that.  P1: or upward direction. no. one street has both direction.  P2: but are we doing like. are we considering.  P1: this line.  P2: are we considering only like this is going this way. are we considering this as a whole thing as one street. or the whole thing.  P1: that is good question. because maybe we should make it a street as a whole. and street has line.  P2: yeah and they have lane again then. c’mon. direction we have three lanes again. in this direction we have three lanes |
| 5 | 4:30.9 - 5:15.1 | P1: and when .  P2: okay so make street as big thing. and then street should have up property or down property. something like that. attributes up or down or something.  P1: yes. what I'm thinking about is the user want to. should be able to decide where the traffic light is. so is there. or is it at other side of the street . but where to model this. and sorry. |
| 6 | 5:15.1 - 6:55.0 | P1: intersection should be also a class.  P2: there will be traffic light at both. see because this traffic light is for people who are going in this direction. this light is for people who are going in this direction . and this light is for people are going in this direction. so we need both.  P1: yeah. but now we also have that intersection problem.  P2: yes.  P1: so has a street intersection or has the map a street and the intersection.  P2: intersection is property of the map, easier to handle.  P1: yeah but intersection should be connected to a street . to two street. yeah. just two certain streets.  P2: how do we connect two streets.  P1: with the intersection.  P2: yes but in logic.  P1: yeah. but intersection has street one or street two.  P2: so this is intersection one.  P1: yeah.  P2: it will have one vertical one horizontal something like that.  P1: yeah. should we do it like one intersection has the property or contains.  P2: intersection should always have two streets associated with it compulsory (inaudible) has two street associated with it.  P1: so we have intersection first number or.  P2: yeah. name or number id or something .  P1: id  P2: string. |
| 7 | 6:55.0 - 8:26.6 | P2: or number. number is easier to handle .  P1: then only street.  P2: well street one and two and they can't be null. we have to make it as not null data type.  P1: should we call it like vertical and horizontal. does it help.  P2: yeah. it's. again it'll depend on the side we are looking from. but at least we have to have some name for it so that's fine.  P1: vertical street.  P2: that sound funny. it's like it's going up in the sky.  P1: horizontal.  P2: how do we specify that none of this can be null.  P1: there's opportunity I don't know how.  P2: okay just put a bracket as not null the developer will.  P1: constraint I can look it up. vertical street is it how does it. we need a key for here. name. name. string and.  P2: you give an idea again it will simpler to connect them then.  P1: why. I guess when we call intersection number one and the street is.  P2: street will have a name.  P1: and vertical street also name. no. but  P2: vertical street is of the data type street again. can we do that.  P1: yeah. we can.  P2: that's good. . |
| 8 | 8:26.6 - 9:45.1 | P1: so okay. then we have that map. and in map we have street. intersection.  P2: traffic light.  P1: but yeah. traffic light that's interesting should traffic light be in the intersection. should intersection contain a traffic light. or should the street contain the traffic light. because we only have yeah. should we allow the user only to put the traffic light in the intersections.  P2: no maybe really long street that's going on and we have a pedestrian crossing in between then we will need traffic light again.  P1: yeah okay but we need to specify where the traffic light is. exactly on that street.  P2: okay how we're gonna do that.  P1: is it ?  P2: by length we can do that by length of course.  P1: yeah but we need two numbers I guess. where this.  P2: of course from the starting point and how much distance.  P1: but how time do we have.  P2: not much ups what do I do. |
| 9 | 9:45.1 - 10:23.6 | P1: maybe we should leave that option.  P2: yeah lets start drawing we have like 15 minutes.  P1: yeah and then we have the 45 minutes to create the models to design.  P2: and the documentation.  P1: ok yeah. then we leave that only on intersection we have that option .  P2: okay fine simple. yeah. but to write all this also gonna take some time.  P1: yeah I think I will do that. what not null. where was it not null.  P2: any of this all of this is not null. |
| 10 | 10:23.6 - 10:44.7 | P1: yeah maybe only street because when you don't have intersection is possible. but now we have that.  P2: not null for street length also I'm guessing. |
| 11 | 10:44.7 - 11:21.1 | P2: otherwise is it just a not street if it street it will have something. and definitely street name also should be not null .  P1: yeah. no. when you don't have a street you don't have a number or name.  P2: when we don’t have street. we just don't call this data type. we don't call an object for this from this class. why we would call an object street but create zero zero.  P1: but when you create this a database would that table street it is possible there is no street in it.  P2: okay .so we leave that option also.  P1: I don't know exactly. it's fine. |
| 12 | 11:21.1 - 12:40.8 | P1: but I also. I'm still on traffic light the problem. because when we say okay. traffic intersection has traffic light. but. that does not explain where the traffic light is on the right side or on left side. maybe we should make lanes.  P2: we have to make lane under the street.  P1: is it sub class or contain it. but how to specified a lane. only right directional or only.  P2: no lane will be. you talking about this whole thing.  P1: yeah  P2: okay so make it up and down. up and down is fine for that.  P1: okay. should it be a sub class of street  P2: just attribute of street I mean. is it either up or down.  P1: yeah but. then we should model the opportunity that the traffic light is on one side or on the other side. how to model this. |
| 13 | 12:40.8 - 14:19.4 | P1: oh maybe a lane has a traffic light.  P2: yeah every lane should have a traffic lane. that would make it easier. because see. we are considering this whole street I say Oudegrah street this whole thing. both side of it . okay and up side will have traffic light down side will have traffic light.  P1: yeah. we all have to connect this that's the problem now. so we have two.  (drawing).  P1: up ward lane. down ward lane.  (drawing).  P1: but I don't know if there should be two different classes but I try to think of it. because maybe the.  P2: and I want to make actual lane in each of this street.  P1: this is street this is lane.  P2: yeah inside the lane. like the lane is half of the street. which is going in that direction or in this direction.  P1: oh I thought this whole is a street and this is a lane.  P2: well lane is more like. inside of this. we have lane like you know this is the bus lane. this is the bike lane. this is the car lane. those are the lanes.  P1: should we . it's so complicated.  P2: we probably don't have time forget that. |
| 14 | 14:19.4 - 15:33.8 | P1: okay. but now we have still the problem how to connect this. we have intersection intersection has a . vertical street and horizontal street.  P2: well we can connected by having a traffic light being associated with an intersection I mean this don't have to call the traffic light. the traffic light can call this. see so for each traffic light we can have the properties as like attributes street one two or however and intersection bla bla bla. and then the traffic light becomes like an independent entity. we can place it anywhere. in the map and then we just connect this property to it. as the property of traffic light.  P1: that's a good idea. okay we have that traffic light we have that street.  P2: I think that would be simplier than trying to put import traffic light into each of this.  P1: that's good idea. so intersection is a property of traffic light also.  P2: yeah id just put id that number.  P1: oh yes. |
| 15 | 15:33.8 - 16:33.7 | P1: and no should be a in I guess.  P2: well actually would be you know. this traffic light is the first traffic light of this intersection so it would have intersection id so and it's on traffic light id.  P1: yeah yeah yeah but I think it is a id or in model I don't know.  P2: id id id.  P1: but id is not a data type so. it only date variable. I don't know if a variable has. yeah. I will think about when. so we have that intersection now we know that traffic light is on that intersection but in now we need this street to specific is it on that street or on that street so street. |
| 16 | 16:33.7 - 18:35.1 | P1: and then is it on the right side or left side?  P2: well it should be on both side.  P1: yeah but you. yeah but you need two traffic lights when there is.  P2: yeah but each traffic light.  P1: yeah its individual and has a side. so you have to decide.  P2: it doesn't. ok so just so fix with dot R or dot L left side or right side.  P1: yeah we should a red we should specific this here somewhere.  P2: in here.  P1: yeah here and just should be seen some here here because we vertical street horizontal street. we can use this. street. street has. lets see. street has the right side. it is in the left side. and when.  P2: no I don't understand because we have already an up and a down direction so what a left and right side. but the right side and left side we named it as a for down so we don't need both. we either have right or left or we have up or down.  P1: yeah when you said ok the traffic light is on that street named.  P2: we said the traffic light.  P1: yeah and then you said only this is on that street so now we need the attribute lets say ok it is on the left or right side but the attribute should be reference to.  P2: dot oudegrah dot left. |
| 17 | 18:35.1 - 19:45.4 | P1: yeah but should be somewhere attribute.  P2: yeah so put it in the direction we should can have two values left or right.  P1: yeah but when you say traffic light is on that street and you can't say ok that street has a. now I think we should we must do it like this. because you when you say ok traffic light is on that street. the street has always two sides so you can not say ok it's on the left or right side it should be here an extra attribute and the traffic lights now and now I'm thinking of how to model this on the street. you want I mean?  P2: not very but I think we can have this is the traffic light id maybe and it has an intersection id, a street id and a side id .so it has all these properties and you have again extra traffic light at Z intersection at oudegrah street on the right side.  P1: yeah |
| 18 | 19:45.4 - 19:52.0 | P2: so then if this is the street |
| 19 | 19:52.0 - 21:11.7 | P2: ok this is one traffic light here and one traffic light here. this is to do note this one this to do note this one. so we have for both. these all these are like variable you know this street name the intersection name and the left right up or down the direction so a combination of these three will be enough to position the traffic light will be enough for us to know.  P1: yeah yeah but I'm thinking about how to model this because you have to this is like a method or something because you have to hold you have to. I don't know how to say because yeah you need other way to model this. because a street has a right or left side always.  P2: ok.  P1: it always yes. so you can not say ok.  P2: no a street has both sides but see this are not like. it will have say like this street is called oudegrah left this street will call oudegrah right. it's called that it's not like.  P1: yeah but then we have to make two classes out of it. |
| 20 | 21:11.7 - 22:10.0 | P2: can't it just be an attribute out of it. which can't be null .  P1: we don't know how to refer this attribute. because when you refer when you say ok street has a side it is so we say ok say it is on the right side but where do you have that information. you can not say ok you have that information from street because street always have both.  P2: yes but that information will be on part of traffic light, right.  P1: ok.  P2: so this traffic light will belong to Z intersection oudegrah street left side. so it has all information about this street the sides of this street and the intersection.  P1: ok I will see how to model it. yeah but I think it's fine.  P2: lets try because |