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If you now, is it? So it is to determine the portion of an object of a line on this side, of which on our side. Here, for this region, we call it a big region. So for example, let's say a it's a privilege that can be the either window on the screen or the new volume. For example, this is a reward is that is aa frisk a first time given citizen. This is reaching this portion outside, this portion outside. So we only consider this part of the inside. The problem is that you have to determine which project is outside ok which person is outside, also designed by efficient atoms. The efficient designer efficient, even though is different, is a complex and consumer algorithm. It is possible not to do that.

For example, this is a this is atv screen, so we only consider this part. So this part is outside. You have to be happy about this part. Determine this kind of outside. So if we during the revenue process, if we can detect this part is outside this portion outside of this function outside, is that is, do you have a limited process and you do a lot of process? It has to increase, save the competition results, ok you can see the competition results. Before the regiment. We have a property determination. So here ii i've been introduced 2 kinds of algorithms.

So the first one is the as is a kind of not making mechanism, the progress is so much. In a I use a d two d longer, so you can think about how to extend it should be ok so this is getting a two d plan. So this is a deep region, ok and in the two d plan, two d spaces, there are multiple lines, some lines. So for this, the line three is completely within the preparation. The line four, so the line fire line was complete outside.

So here for line is only this segment and within the liberation. So we have to do behind the in terms of this question downside and take, instead, it takes this seven only takes them this cycle within an average. So this is the purpose. And so this is the purpose. So this episode is quite efficient. This atom is quite efficient. For this algorithm is for a line, we know it has 2 points, right? Each line has a few other parts based on a clear region without a clear region.

So this clear region is about to package, is another temple based on the four borders. If it on the four borders, we can partnership this to the space into nine sub region. Right? For example, the borders of this liberation, we have published a few basic designs of regions. So 12345679 separation. So the next part is the weekend. A sign of four vehicles appear required for vehicle and for vehicle the world. For each region, we can assign a four people report. How do we find this copy of the world? So therefore, each there for me to hear it is left to right, but left right button up. So how do you define that for difficulty? So we can use this the following. These rules and these rules to define a particle. The first big for the first big I use, l indicate the map, ok so if we a use a relative position, ok the position relative to the people reaching and to define a four vehicle, ok if x is a smaller than xpok here, this is the xp so that is the next problem.

The next problem, if x is smaller than xp we will send the first pdp one. We will send the first pdp otherwise. To zero, the second p is the right ri use the rep to the right. That is it was a given a .. So if actually the largest aspects, so that is the right part of the people, which is the right part of the paper if I asked a large amount of tax. So we will send the second one, the other one, the second period is set to zero. Similar is the bottom and the top part of this. Right? The third meter is the bottom, so that is a five. So the project is a compound, but is relative to the violation. If y is smaller than ye that is in this region, the circuit will be 71. The last bit. If I why is the largest ysok it's even if for the region on top of ys so the first period will be 71.

Based on these four rules, we can assign them. We can assign each separations. Each celebrate is with a 4 bit code one. It is a 4 bit code one. Ok if the other part that if the other part is a little bit easier is in, the corresponding relationship will assign this public particular to the responding in the past.

Ok the responding part ok so this is the first we published based on the location relative to the region. So we have a sign of for people to each sub region and for the people reading. So for people is 07. Ok all of the 40 is zero. Then. The next part we also define two criterias ok we also include two criteria. So the two criteria is true acceptable to reject triple satellite, pure that. So for the meaning of pure satellite, for example, this line, the line three, is it the q and a policy? Both of the treatment parts of within a clear region? So that means this line started must be within a treatment, right? So is that really just a step this month? So this is called a few %. How do you know this line is completely within the capability? How does this keep this line cycle is completely with negative reach? We can do the formula. We can use the 4 bit code work assigned to the other parts.

If the human parts are located within the color click region, that means there's a line cycle that must be within activity. Right? For the triple region, the 4 bit group one should be 0001. That means if we apply the logical operation in mid ones, if the result is a zero, if the output is zero, that means the q four being good was must be zero. What is the logical harm? What is the logic of you? Still remember? The logic of the logic is the end is obvious the logic. If you have an additional subject, right? That is a logical of return. The logical order is that if both equals are zero, the output will be zero, is a zero or zero equal to zero. Otherwise, it also will be one, right? 10001, 01, 01, or these three cases out of 10 k so only for the cases, both he puts out more as a result of the same right.

Here. That is, if you apply the logical operator to the four vehicle towards of the 200 points, assigned to the points, if the output is zero, that means the 4 billion rewards of the false enterprise as in if the false enterprise are within a degree, that means this line is completed in a degree, right?

As we can truly assign this month. And she's upside then, okay? Instead of noted, also we can define another the second ones we can also be kind of pure people reject to reject what is true reject to reject.

For example, if you consider line one, the line point is completed on one side, on the left side of this region, right? Line based on this figure, the line one is a complete answer. Left side, right? Is a company on the left side is deliberately. So we just believe this line. We just believe this, and also there is no clean operation. So how do you know this lines on one side? How do you know these lines on one side? The company on a typical side of the region, the left side of the right side, on the top of the button? Based on the for we called for we could assign the present part. Here we can use a lot of time operation.

Logical end up if you apply the logic and operation. If the result is not zero, what is sorry, the logic and operator? The logical hand, the energy, you force you to someone, a true. The output will be true. Otherwise, the output will be zero. That is a 010, one, and 00, and one, right? For these three cases, output will be zero. This is a logical end. Only for the cases, both equals are one, are true. Output will be true, but otherwise, the output will be false, right? If you apply the logic and operation, indeed wise that is the gist applies and not china bit by bit, so respond to be if the output is not there. So is that means of a typical case, but also for the for the four vehicles, the 24 vehicles are typical if it must be zero, must be zero.

For example, if you consider this line, if you consider this a line one, okay, apply the so for this in the top as this is the part, the the four p code is a 1001, and this one is 10101.

If you apply the logical and ambition, so the first period one and one is one, right? The second page zero and zero is 00, and one is 01, and zero is 01. The output is not zero, because the first kid is the one. We know is complete is on copy on one side. So also, based on the first period, we know is on the left side, is on the left side. So that means just a few minutes. This line is that a different information? But for other lines, for example, line here, only this second, this portion is within population. We have been and this region is the only this part. Yeah, so how about the line one? Based on this figure? We know it's a company the outside. But if you apply the true accepted to reject, this line cannot be truly rejected or truly accepted. You can try. So if you apply the logical, if you apply the logical operation, he said the result is a not the same way. 000110005.

You can attribute upset, but if you apply the logical end, giving up as much as a result of this year, also, you can treat each other, although because this line is a complete outside, but if it's a line, if the line cannot be truly accepted or to be rejected, we have to come from location, and we have to come up with me.

So how do you take? The general idea is to fix one plant and the moment fixed one of the plant, and the moment the other in the plant, ok fix it, one, and the plant on the move of the other offers ok so for example, if we consider the this line, for example, for people were assigned 2 points, this is the point we know, is that within a critical region, right?

Just to fix this at the ., based on for this is the points outside, based on, probably could we know it's all set the 00, 0001 is outside five. A a we fix this one and five and over the top at the times. Ok so how many polls, how harmful aren't being on the topic? But we know the line will intercept with which part of how do you know the line is on the following code of the tree and plants? We know this line and we will accept with each part. We just check the responding fees if the change from 0 to 1 or change from 1 to 0. That means the line second master in per second is a typical part. Right? Based on the definition of the for people to work, right? For example, this party, the last page, the first page for this advise, the code is one. And for these enterprises, the last page is zero. One is 01 is one. Based on the definition. The last bit is defined as relative to the talk about the right. We know this line must intersect with the top bottom.

Both if Both of the four speed are zero, this line will not in the second level, the chief problem, 1 ~ 0. So that means this is my last thing I said to the top partner ok then we can calculate the infrastructure part. So let's say this is the infrastructure part, right? Calculated in the second part. Who is the top partner right here? You obtain the, yeah, let's see. This is the intersection part based on the location, the car limit. We come up with a assignment code on it. So what's the public code one for this investors part? What's the public code of this investors part? X is a larger or smaller than x is larger, the first figure should be 05. X also, survivors, xx the second, it should be zero. And for the problem of why, so why isn't largest yb the circuit should be zero back.

The first piece, here, this time is located on the taobao that is ay equal to yx the first page should be also thereby. Because based on the definition, what is the largest one? Max, the first period will be one. But here is where equal to what else exactly the possibility should be? 01. The probability of this infrastructure part will be 00001.

Then after our team, this 4 bit code, this intersection five, they applied to practice two questions.

They compress these two questions to check whether this line segment that can be truly accepted and truly accepted. If you apply this, if you can do it, so most of the prices are 000. Right? So it can be accepted, right? Then we started. So this part of it can be exciting. And when we started reading ok if it can't should be accepted, that should be rejected. So we have to hold the quantity. Is it okay? Yes, you can also try the lines line for it. Can be truly excited to reject it. Right? We have the problem taking. So taking, you can fix it either as part, fix this one and hold this one. Here is okay. Fix this one over this one is awesome. And just fix one, even the legal force. And the points are not within the liberty. You can hold these one, fix the other one. Okay? If the prize is noted within a particular, so we can't move it.

Ok we can't move it. Ok for example, we fix this one and hold this one based on the code change from 0 to 1 or 120. We know this line faster in a second, in the left bottom, the bottom, and right bottom, ok so also, based on the location, based on the following, it will intersect them.

In the second of the 5 . first, you calculate that in a sense of part. A this is an infrastructure part. What is the topic of this intention part? This one? Yeah. The first bit is a zero. The second phase is a zero. The third phase is a is still zero because of y equal to one, even why smaller than why it will be one time? Plus the service is here the first meeting set zero plus this point is a this is the same kind of formula is zero. That means this is a part of the group is located within a particular reason why ok after this innovation plan, this is a section part, and then you can apply them and this one. Then you apply the two criteria to this 1 second, apply the two material of this segment.

Okay? If you apply these two criteria is still kind of be truly acceptable to each other. Exactly as a subculture of this mindset is still outside, but we have to move on me, but which is the time for this last segment. This intersection part of the code is zero. That means this is located with a different region. Then we have to call this one, right? We tend to vote it. This and the part one, then if you volunteer here, and if you do that in a certain time, it will intersect with the right order, and we can calculate the checkpoint. It calculated the the funky code. What's the funding code for this one?

The first thing is that zero. The second is the x equal to xx is zero, the 30, the first week 05, this side, five is 20000. Our class is a 2 . 0. We have known this mindset. We gotta send the response. This is an algorithm. The question, how do you extend it to series space? That's the experience we have a cube. The cube region is a cube.

And industry students, there are multiple lines, is a liar. Maybe the second that you pay off the company outside may completely inside. How do you extend this average material through this case? This is a catalyst. How do you extend to these three issues? Some kids, there are some of his tax, right? Also, you have to define the rule how bad it is for the company. How do you define the truth set to reject the two criteria ok so you can think about it. The extent of this element to the 323 states in the three states. How many days? How many cases are required to define the topic of the world? That means how many borders we define that in the line segment. Sorry, is this algorithm? We do that. For this type of region, there are four and four boundary, right? We did for a 4 days, right? But for the queue, how many problems? That's six cases, right? That is the six part. Six, the border is. It's a pen, not a line.

You can see column. This is a line kicking himself. The line kicking himself. Yeah, the next one is the part of taking an example. His idea is similar. The purpose is that you put is a two d part of the output of the list of the paper. The typical of vertices, let's say this is a graphical angles, so this is rather than the capability.

Here we have to these cases, we have some higher, we have some apartment, we want you, for example, called history. So this is the sun portion of the lab in the paper is right. And for peace was completely based on this figure becomes a car figure. Complete with the activity. And history is a company outside. For this case, we have, sorry, case four and case three, some portion overlap. Okay? The purpose is we want to impact. So for this part of this portion, so we have to pay for this part. For kitty, we just come here. We will believe this part is a country outside the region. Right? Here we have similar to the line with an algorithm, and similar to the line that you have. So we can define a bombing box.

Here is the dash line, but dash line is what is your particle with 25 amount of dollars? You can define the boundary box, even the boundary box is complete outside, but people reaching we do the private must be complicated outside, right? If the bumping box is completely within about quickly, we do the pilot must be updated with integrity, right? For the bumping box, it has a revenue ship. It has a reference should be adjusted happen. You just compare the four borders. We just compare aa followers. And so this was that we had truly said this one and true each other. To the project for this one is the bombing box. For the founding box of keys three and keys for overlap is a decrease. We can't reject all of a sudden is to policy that we have a publication. If you have to ok to picks up, so he picks aa part of it. So the average percent is also possibly, if you want to take a project, we have to keep the quality against each bottom.

We have to take the particle against each bottom, for example, for example, we want to keep the part of this case, right? We know what that is. We have to keep this calling at least the left bottom, right at the top and the forwarders. Here, for example, we really relativity against the left about the first. For the left, bottom is a line, right? As a line, the line second is a tree space. Ok so the line separate the tree spaces, two parts for that. So here for this part of it, we mark it as the outside, this part of the inside, outside, and inside, then we will justify the vertex is inside or outside relative to a typical function and relative to a typical function.

For example, this part is, we decision is outside, this part is inside defined by this left body and that's the body. Then do you select a typical for texas starting part? You will select a typical partner and actually anyone the animal texas study part. And we will check the inside and outside ok so let's just back to this one. This one is a this immediate is inside, this region is outside if you find the bias. So that's the bottom.

So that's what we started from donald trump, this context and the visit of all vertices. So this is a inside right inside. Then we will mark this one here inside, then go to the next one insider and the next one insider. And this is also insider. The next one outside of it. All right? One for the party, right? For the parliament. So one of the part is the inside, and one of the part is outside. That means this edge must intercept is about function. But why is it inside of 1,000? So it must be in a second, is a boundary. The boundary as if you calculate a certain part and mark this in a certain part, a what's the exciting part? Ok as a society. So this is the same time as a society five. And the they challenge what is that outside, right outside.

And then now we have visited all policies of this . ok for this one. Also, this is a cuban part of the line one inside outside. We know that the intersection one, right? Also calculate the construction plan and master. This is the structure plan as aa society. So after visiting all vertices of this part of it, so we just pay the the work of it just keeps the vertices marked with inside. And this exactly. We only retain the vertices mark marked with inside and society. So that what is this? So this part we will take against them. We will be vote against them. The last part, this is a premium rather than these are typical that one, then you have to sleep against the bottom as a red bottom, as a outcome. And the other country. Then after picking up is the all office of this to believe. So we are oki see the object. So it's also the efficient how to say.

So here one question is, how about if the key region is not for the country? The liberation is not a particle. The paper reading is not a part of, for example, paper reading the circle. How do we have? It is the part that the capability a a is a parliament, right? So the parliament, it composed of a line. Right? A straight line, right? Then we follow each act. It can separate the tvc to be inside and outside. But he actually the three to reading the service that is a curve, right? How do you handle this case? You previous that you can use a particle to the proximity of some of that. But certainly, so they said, you just, for example, if the bridge is a certain time, so that some clients over the circle uniform, right? The user point of answer, if you select more clients, the approximation area with this model, right?

This is a particularly not a partner, so it is aa certainty, A very, sorry. This is not a part of it. You can do the part of oxidism. The curve. Actually, the digital computer is a a it's a and I mentioned in the first lecture, there is no continues is a descriptive like how to draw a circle, right? As actually is a toxic. It's a proximity. So this is the whole average of how the kids are. So actually, the idea is because it's possible ok so here who designers out is only one. You have to consider the the efficiency. You have to consider the efficiency. For the cleaning algorithm, the line of other, the part of the ticket, you can use some competition asset, other countries, the overlapping in which you are, but the contest will be high.

But for this could be, so it's I the efficiency is very high. It is a popular single definition and has another operation. So this will be and the efficiency will be very high. Okay? Yeah. So this a is that I think some of the question asked about, just think about how we extend that. This is the lecture after we can have a this. We can have AA 5 days for.