0. Once upon a time in this world, A 12 years old boy was checking his mail box. He saw an email from “Computer Island” which he had never heard of.

This was the text of the email:

Dear Programmer,

This is a secret email from us. Don’t tell anybody about this email!

Our island is located in the underground waters. We are working on a great Computer Project and as we could access your computer mark this year in school, we just got that you are the guy we need. If you want to join us, there is a little challenge for you.

There are two numbers randomly chosen for you as A and A. You should say what a×b-(a+b) would return.

A = …

b = …

Reply your answer to this email.

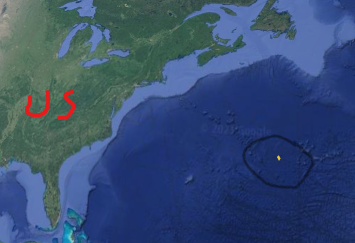
Now, let's ask you. Can you build an algorithm to return the answer with any number in A and b?

1. The boy, oh let’s first introduce him to you. His name is Sam. Sam was surprised. Who are they? How could they find him? Why did they choose him? (his computer mark was 6 this term, hahaha). Then he thought he should go there because it may be interesting. He finally sent the answer and waited for their email. After a month, an email came:

Dear Programmer,

Sorry for our delay. Our processors are too slow and they just could check your answer yesterday. So because of that we are searching for new talents.

Our location is here:



But 100 kilometers underground. The way is to go on a ship and jump out of it near this spot. Then you’ll see a green light down in the ocean. Pay attention to having scuba diving equipment. Follow down to the green light and you will see a gate. There would be a map to help you.

And if you know somebody who can help you, you can tell 1 friend about this and he can come with you.

Waiting for you.

He couldn’t go alone so he told his best friend, Alex about these emails. Alex agreed to go with him. They went to a short Course “Scuba Diving in Two Weeks” and they were completely ready, so they went on the ship, jumped in the seA and then they were beside the gate!

There was A little screen that this was written in it:  
Hi! Time for a little verification.

Do you remember which number did you reply to our email? Put that as “a” and return this: A \* A + a.

Answer: …

Now it is your turn. Write an algorithm that will return the answer with any number in A. And we’ll give you a so you don't need to remember!

If

2. After the verification a map was shown on the screen. Sam and Alex walked through the way. On the way, a man was standing. A conversation started:  
Sam: Hi!

Man: 12454864936, 12454864937 oh, hi. 12454864938

Alex: What are you doing?

Man: 12454864939, 12454864940 I am counting. Oh, Can you play with me?

Sam: What?

Man: I love numbers. I want to ask you some questions. I will give you two numbers as A and B. If A is bigger than b, return their average. And if not, return A+B.

OK. Your turn! But first some points:

* The number will be given in a way that their average would be an integer.
* Think about what you should return if A = B.
* You’ll Learn a new algorithm in this question.

Ready for coding? Start!

3. The man continued:

OK. But you are not a pro! Another question. Think of 4 different integers as A, B, C, D. If A is the greatest, return B+C. Else if C is the greatest, return A+D, else if B is the smallest, return C+A. ELse return A+B+C+D-2.

A bit complicated? You can do it. Let’s go!

4. The man wasn’t going to stop:

Oh. You are a pro. But wait. Only legends can go! Another question. You have two numbers as A and B, if A^5 > B^6, return A^B. Else if A^7 < B^10, return A\*B, and else: return B.

3, 2, 1, Go!

Loops

5. Finally, the man let them go and continued counting. Two monsters were on the way! Alex and Sam were extremely horrified. The monster started talking:

Hahahaha! New talents for Computer island? We are the enemies of Computer Island. We are 10000 monsters living in the Wrong Island! Our policy is: “Wrong answers, best ones”. I will ask you A question. If you give us the wrong answer, you are the perfect case for our island and you will work on our island. A number called A is here. If you can say what is the total of all the divisors of A in the wrong way, you’ll come with us.

Pay attention that they should work 24 hours a day and they’ll not get paid! So help them and tell them the correct answer! And you’ll learn a new algorithm in this part.

6. “Oh, you answered correctly! You are the worst case for us! Get lost!” one of the monsters said. They went straight through. And there was an Elevator. The liftman started a conversation:

Liftman: Hi! Welcome!

Sam: Hello!

Alex: Hello! Thanks.

Liftman: There are two choices for you: to walk 100000000000020000560009000000056 steps down or to use the elevator. Which one would you choose?

Sam: The elevator, absolutely.

Liftman: So you should pass the elevator test. Go to the monitor over there to find out about the questions.

On the monitor, the first question was this:

We’ll give you a range (the starting point = A and the ending point = B) and you should decide which numbers are divisible to B - A and give the total of them. For example, if you recognized that C, D, and E are divisible to B - A and they are in the range of A to B (A and B are also counted in the range), you should return C + D + E.

Looks hard? You can do it! Go on!

7. And the next question:  
Give the answer of 5 + 8 + 11 + 14 + 17 + … + 51 + 54 using loops.

It won’t be hard. Just you’ll learn a new point about loops.

8. And the last one:

Two numbers as A and B will be given to you. While a is greater than B, print B + A and do an a-1 each time.

That is a new part of loops. Go for it!

9. The elevator door was opened. There were thousands of keys there. They didn’t know which floor to go to, so then they opened the map again. There was something written there:

Stand in the elevator and ask the liftman to move it down. Start counting from 20000 and come down. While your number (A) is greater than 9, continue moving down.

Not too difficult so you can get familiar with WHILE. Let’s go!

10. Finally, they reached the correct floor. There was the Computer Island sign but it was deserted. It seemed like they moved to another place. A cleaner man was standing there. They started talking:

Alex: Why is it empty here?

Cleaner: We’ve moved to another place.

Sam: Can you show us where it is?

Cleaner: Yeah, but you should help me. Every day, the vertical diameter of a diamond-shaped area is given to me and I should clean it. Please write an algorithm that draws the hollow diamond with the given vertical diameter. Use “\*” character. Then I’ll help you two.

So. It’s up to you. Good luck!

11. So the cleaner is now happy. He wants to help them:

OK. Now I’ll tell you the way. Go down that road. On the first turn, turn right. Move 20 steps straight and then turn left. You’ll see a maze you’re in. then look at the map. A number will be written there as N. For N times:

Move 40 steps,

Turn right,

Move 5 steps,

Turn left.

You’ll see the sign of Computer Island there.

Now please draw the pattern of where you’ll pass with “\*”.

OK. Now write an algorithm that draws the pattern with any number given as N. Start!

12. They were out of the maze! They had the Computer Island in front of them! They went through the entrance but there was a gate. On the monitor, it was written:

Hi! Welcome! For the first entrance, you should confirm your identity. You should write an algorithm that draws a simple human with a parameter as P. It should be like this:

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