HourOfCode_Script

Introduction:(Yash)

Hey Guys,

Why what and why and what is what:
left's First start with Introduction ...(names)
let's come to the point: what and why
you must ask these two questions yourself before you start learning new topics what to learn and why it's important right?
like most of you learn many things but they never asked why I am learning this topic for eg
do you know who is the father of the computer? (Charles)
but why Charles Charles Babbage?
why the analytical engine was so revolutionary invention?

Because the analytical engine was the first machine that can be programmable. what do I mean by programmable? here also what and why questions come up so think about it. let's come to the point what I mean by programmable.

okay if I want to add two numbers in calc. what I will do first is enter the first number then I will press + sign then will enter the second number then will press = sign now if somehow I may automate this process like I will enter two numbers then it will give me the addition of two numbers then it is called programmable machine
here I need to add only two numbers what if I want to perform 1000 operations on that two numbers daily. It's donkey work so what if I program that thing and a machine will do it for me it's smart work

The internet:

okay, let's come to another what
what is the internet?
how it will be provided to us?

The internet is nothing but a group of computers, not more than that
how the internet is provided to us any guess? why does a telecom company not give us unlimited Gb of data?

The internet is not on the cloud. But it is under the sea. Internet provided by sea cables? unbelievable right? but it's true there is no satellite involved in internet
lets understand how internet works

two types of company involved in this process first companies are who have spread the wires across the oceans see this is the map of current wires in ocean
in India this facility is provided by TATA communications

and then your isp comes into picture for eg. airtel or jio
they pay for GBs of Data they transfer from that cable like toll tax you pay right for using that road.

and your isp charges you that cost and also profit that's why you don't get unlimited GBs of data;

let's check that if I access google.com from where this data comes from

now I request my colleague Bhavya to continue from here

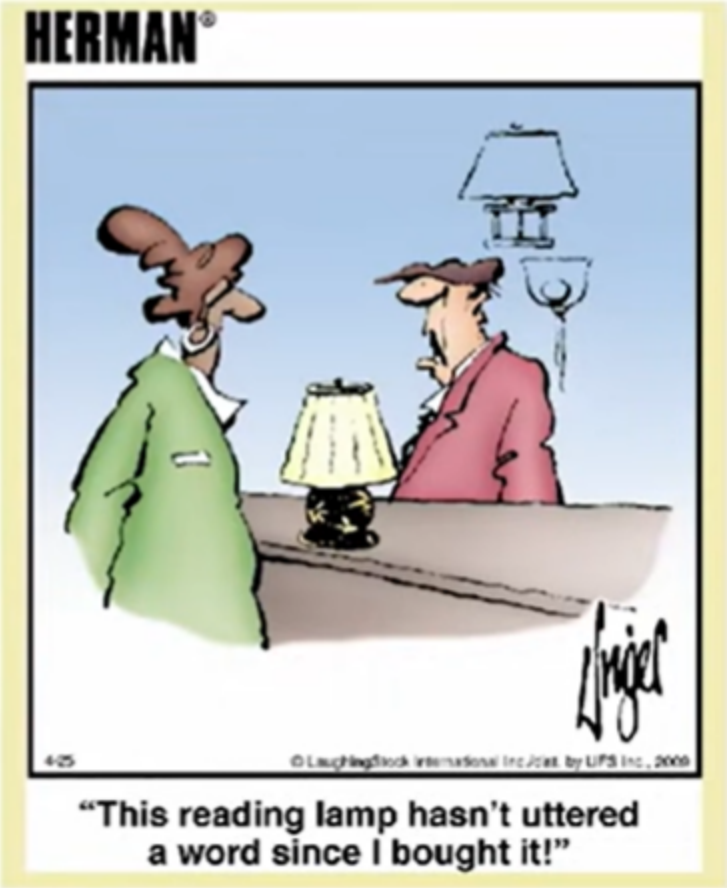
Questions: (Bhavya) So If I'm not mistaken, you guys are learning Visual basic. Has anyone of you ever wondered why we actually need these different languages? What are these languages anyways? Why do we need to write things in a specific way for them to work?

Why computers: If you don't know how to do a homework question, what you do is you find a friend that *can* do it, and tell him/her to solve the question for you, and then you write down the solution in the book!

So there are people out there who, god knows why, want do do a lot of maths calculations. But they can't do them fast enough. So like you guys, they built something that *can* do it, a computer, and told it what to do! And to tell it what to do, you need to communicate with it, and that is where programming languages come into picture. Visual basic is a way to tell your computer what you want done.

Dumb computer: But the thing is, computers are dumb. A computer is basically an electronic circuit that gives you an output, if you give it an input. So if you don't give it any input in the first place and don't tell it what to do, it won't do anything!

So because it is so dumb, if I don't tell it the exact steps, it won't know what to do. <insert the funny pic> That's why the programming languages have a strict syntax.



So cool. You have a computer, and you can tell it to do stuff using a language. But now you want other people who also have a computer to be able to see it. How do we do that?

Computer Networking: So that is where the internet comes in. I'm pretty sure you've been using this thing called the internet for YEARS now. Does anyone know what exactly this internet thing is? How is it that we just open this thing called Google. We type in what we want, and like a genie it grants us our wishes. Where does the information come from? How does something you send in an email reach the other computer? How does typing a website name in a search box get you ?

So why do we care about sharing information?

It all started when military and researchers wanted a way to communicate to each other. They had to carry big magnetic disks from one place to another to transfer information.

Nowadays, we use Instagram to share your photos and videos with other people so that they can get jealous of our lives. If you want to ask your friend for homework, he is able

to share a file to you on whatsapp. If you want to read a book but don't want to buy it, you can find a pdf on google. If you want to understand a topic, there are millions who have shared their information via videos on youtube. So we are sharing information between computers every single day of our lives.

So let us think like them:

How information is sent and what is a protocol:

I want to send information from this computer to this computer. Information is basically a stream of binary digits. So what I can do is, I can put a wire between these two computers, and I can send the string of bits through that wire. Simple.

How will you send "send me your homework" to another computer?

Imagine you and your teacher are a computer, and you do some mischief in the class. Ma'am tells you to write your roll number and your parents phone number on a piece of paper and give her.

You write "979870751681" and run away. Did you write the roll number first, or the phone number? No one knows.

For that you need a format in which data will be written. If both the sender(you) and the receiver (the teacher) knows the format, the receiver will understand the information you sent. Similarly, when a computer sends information, it needs to send it in a certain format, and all computers that want to connect to each other should know that format. eg. I'll first send the senders address, then the receivers address etc. This format has a fancy name: a protocol. But suppose now that you have more than two computers. There are two main questions we can ask:

How will we send the information to that particular computer? We cannot just put a wire between all computers because that will be too many wires. there comes a device called a HUB. A hub is really dumb. It takes things sent by one computer and sends it to all other computers on the network. <draw>.This small network is called a LAN. Now, it is possible that multiple places in the world have these small networks. How do you connect these small networks together to form a large network? The problem is, all these small networks have a different format for sending data. So how do we make them communicate?

This is where you need routers. Each one of these small networks will have a router with them, just like the network in your house has a router. All networks on the globe will have a router, and all routers will understand the same language. And that is how you connect different LANS together. When you connect a lot of these networks together, you form a network of networks. That is called a wide area network - a WAN. The internet is the most popular and the biggest WAN.

IP addresses:

So Google will have a server, which is basically a powerful computer, way out there somewhere on this big network. You want to send a request to google: you ask “why is school so boring?”. The first thing you need to send information to any computer on the internet is an address: something that identifies that computer. Did you see what Yash was typing? what was that big number he wrote?

That big number identifies where on the network that particular google server is located. I have a network; to identify each device on the network I assigned a unique number to them. I’ll say any device that connects in this position on the internet will have this address. It has a name: The IP address. That big number separated by dots is the name or the address of Google on the internet. The router in your home will have an entire map of the internet in it. Whenever you send information from your computer to your router, your router checks where you want to send the information. It sees that address, figures out where it is, and sends the image appropriately.

That is what that router is doing. So the list of numbers that came up is the address of every router your information had to go through before it reached google.

If you want to search anything, you send the information to your router in the language your small network understands.

Thought provoking question: why can 255 devices connect to your wifi?

Here is where websites come in. Why do you think your school has a website? It is so that people who want their children to take admission in a school, they will be able to find the information about this school using their phones, instead of having to come and visit.

So today, we will be focusing on how you make websites, more specifically how do you program how a website looks. So we do that by using these two languages called “html” and “css”.

- **Breakdown of a website:** So when you open your school website, what do you see? Can I say, the website is basically a bunch of words, images, links and lines put together in an organized manner? Have you ever created a project in earlier grades? How do you create a project? You take a chart paper, then you say: I'm gonna stick these images in these places, I will write the information in these places, I will write the heading at the top, I will put my name on the bottom right. So what you do when you say all this is you describe a **layout** . A website is the same thing but it is on the computer. So to make a computer create that "page" for you, you will need to **describe to it a layout of how to place these different elements.** i.e. Where the heading goes, where text goes, where the image goes, where the video goes etc.
- Does anybody have any questions?
- And the way you describe these layouts is by using these languages: html and css.
- Now, we need a way to be able to know how much space an element occupies in order to describe its position. (**I could show this on a whiteboard**) The computer handles this in a very simple way. The computer basically says "I will imagine a box or rectangle around every element, and the space that element occupies is the space that box occupies". So you can think of a website as a bunch of different sized boxes that are placed in a certain way on the page, where each box can contain different things like text, images, etc.
- **<Use inspect to show these different boxes on a page>**
- **How the language describes the layout(we can simultaneously start teaching/showing them the code at this point)**: Lets start by making something very simple. You basically list all the elements you want in order, one after the other. Now as I've said, these elements are just a bunch of rectangles with stuff in it. But we need a way to tell the computer *what kind* of box it is. Is it something that stores text? or is it something that stores an image? To describe this, you write this specific syntax called a tag. A tag is written like this: <h1>Fighting climate change</h1> (where h means this is a header) So this tells the computer: Okay, create a box that stores a heading. and the heading itself is "Fighting Climate Change". So those two different parts to the tag are required to tell the computer the start and end of the box. So in this case, the box consists of only this much text. Anything outside it is not a heading.

- **<Show them how to create these different types of tags and write basic html impromptu>**
- **divs and spans:** Now lets say you have different types of boxes on your web page, and you want to be able to move them together as a group; because moving them individually would be very tedious. So **you want this group of boxes to behave like one single box**. Said another way, you want to put all these boxes in another box! To do this, you can use a which is an empty box. All elements inside of the div tag will be considered as being within that box. So if you now change the size of that div, those elements will collectively occupy that much space.
- <explain difference between inline and block elements, and hence why spans exist>
- **CSS:** So HTML helped us describe what boxes we want on the web page. But this looks horrible. So we need a way to describe the colors and formatting and placing of these different objects. For this we need another language called css.