

Phone, Smart Phones, Phablets, Tablets

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Hi. My name is Prabhakar. I'm with IIT Kanpur. In this lecture let us look at phones, Smartphones, phablets and tablets.

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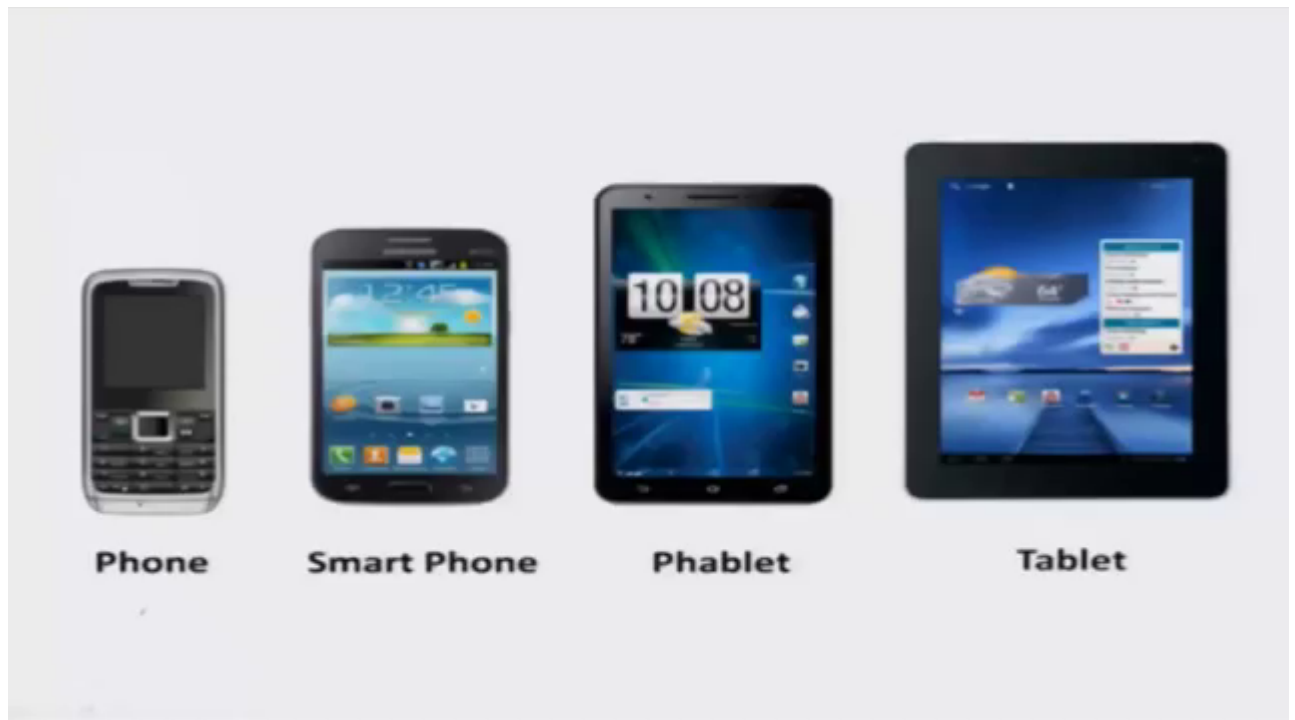
We have

- Phone (feature phone)
- Smart Phone
 - more advanced computing and connectivity
 - Apps
- Phablet
 - Large screen phones
- Tablet
 - large screen – suitable for content consumption
 - May not have a phone function

So we know that there are phones and there are smartphones. So what is the difference between a phone and a smart phone? A smart phone typically is an advanced computing device. It has what we call apps. Apps acronym for applications, it can run small programs. The user can program. Anybody in the world can program which are loaded into the smartphone and they can be executed. Of course it also has advanced computing and connectivity features by this we mean it has Wi-Fi and so on.

And what is a phablet? A phablet is nothing but a phone with a large screen. It's actually in between a phone and a tablet. Whereas a tablet may not be able to make a phone call, a phablet typically has the ability to make a phone call.


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So if you look at the progression of these devices, the smallest is the phone in size, the next is the smartphone and then we have a phablet and then we have a tablet. So what is the typical size of a phone or a smart phone to a tablet.
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Size of the Mobile

- Measured as the diagonal
- In Inches
- (Smart)Phone 3" to 5"
- Phablet 5" to 7"
- Tablet 7" to 11"



So the sizes look like this. The size of device is measured by the diagonal of the screen. So it's normally measured in inches and if you take his phone or a smart phone it is in the range of three to five inches and a phablet is bigger in the range of five to seven inches and tablets are in the range of 7 to 11 inches.
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Weight of the mobile

- Smartphones, Phablets: 100 to 170 gms
- Tablets: 500- 700 gms

And the parameter of a phone is how much does it weigh, so smart phones and tablets are in the region of 100 to 170 grams. Typically we are carrying them on our body, in our pockets or purses and we don't want them to be very heavy. And tablets because they are bigger they are in the range of 500 to 700 grams, half a kilo.

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Connectivity

- Cellular Networks
- Wifi  Bluetooth 
- Speaker, Microphone, Camera
- Capacitive Multi-touch Screens
- Micro-USB connectivity 



In terms of connectivity these phones allow us to connect using cellular networks. We know about 3G, 2G kind of networks. We're going to study more of these in the rest of the course. And then there is connectivity using Wi-Fi or Bluetooth. Many of them have speakers, loudspeakers that in the sense you can get the volume loud, some of you want to hear it together you can keep the speaker on or sometimes when the voice is not coming out clearly

having the loudspeaker on this helpful. It has a microphone into which you talk to and then there are cameras, some of these smartphone cameras are actually very good and very powerful. They are even actually replacing point-and-click cameras. It has capacitive multi-touch screens. And then you can connect through what is called a USB port, it's a micro USB port. This is normally how it looks. This is the standard USB and this is the micro USB.
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Capacitive Multi-touch

- As against resistive touch
- Rely on the electrical properties of the human body to detect a touch
- Hence a light touch of a finger is enough
- Can not be used with gloves
- Need a special stylus
 - Conductive material

Now what are capacitive multi-touch screens? These are screens with which you interact with the phone. You can give input to the screen to the phone. Capacitive as against resistive touch; some phones earlier generation touch devices used to be resistive touch but they are no longer in vogue. So these capacitive devices actually rely on the electrical property of the human skin, the body to detect a touch, so that's why they are very sensitive, and of course then you cannot use it with gloves. And if you want to write you need a special pen. If you're using a capacitive touchscreen phone and you want to use a stylus then you need it a different kind of pen to write with.

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Oleophobic Screens

- *Oleum* in Latin is Oil, *Phobos* is fear
- Oil repelling
- Finger prints, Smudges can be easily removed



These phones are supposed to be oleophobic. What is oleophobic screen? It basically means it doesn't smudge, the oil is repelling. Suppose for example I have the phone here with fingerprints on it, I just need to wipe it off and it'll go away. So oleum is Latin in Latin is oil and phobos is fear, oil doesn't stick, oil is repelled.

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Gorilla Glass

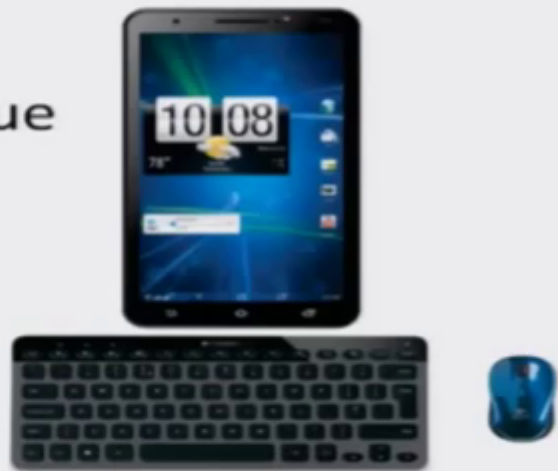
- Trade mark of Corning Inc., USA
- Thin, light and scratch resistant
- Used in most of the phones

The screen is made of what is called Gorilla Glass which is very powerful and strong glass, thin and strong and that's what is used in most of the phones.

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Key board and mouse

- Connect with Blue tooth or USB



You can connect keyboards or mouse to interact with the phone and this connectivity is normally through bluetooth connection.
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Battery

- Lithium Ion Batteries
- 5 to 10 hours of work time
- Capacity 2000-10,000 mAh
- If you fully drain every day
 - Smartphone – around 4 kWh per year
 - Laptop – 20x of Smartphone about 80 kWh



Now the battery is a very very important parameter of the phone. Normally it gives about 5 to 10 hours of working time. So the capacity of a battery is measured in what is called milliampere hours and this number is in the range of 2,000 to 10,000 milliampere hours based on the size of the phone and whether it's a tablet or a phablet and so on. Obviously a larger size means the phone will last longer before the second charge. Now, a phone is consuming energy, right? You charge it every day or once into three days. So how much does it consume? Is it like an electric lamp or it like a refrigerator or how much is it? So typically a

smartphone is in the range of two to four kilowatt hours per year, a kilowatt hour is one unit, right? That means if you take a 100 watt lamp and run it for 10 hours you will consume one unit. So that is the amount of energy that a smartphone consumes in one full year. Of course a laptop for comparison consumes a lot more energy. It's about 20 times the consumption of a smartphone. And of course this is assuming that you charge it fully one every day. So whatever the capacity of the phone is you charge it in the morning and I'd say by you discharge it by evening fully, that means you have consumed all the energy in the battery, okay, that's when you get these kinds of estimates. About three to four units of energy per year.

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Homework

- What is the capacity of your phone battery?

So homework for you; what is the capacity of your phone battery? Find out. Thank you.