

NPTEL

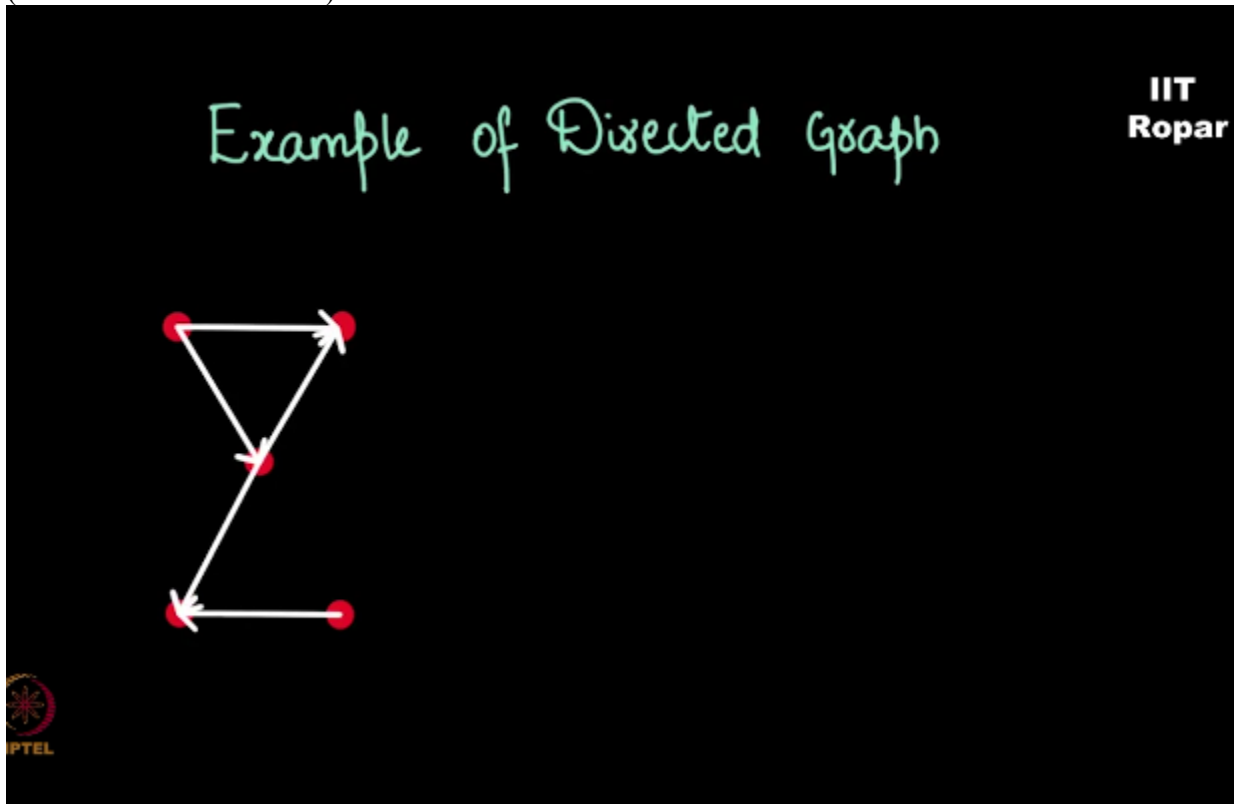
NPTEL ONLINE CERTIFICATION COURSE

**Discrete Mathematics
Graph Theory - 1**

Illustration of Directed, weighted and multi graphs

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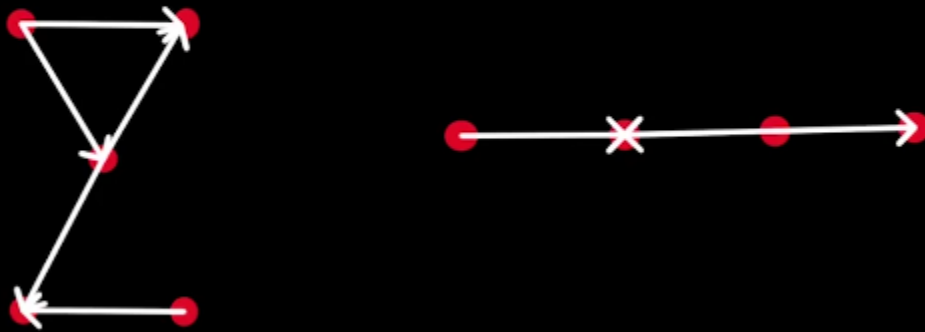
Here is an example of a directed graph,
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you see the directions here, this is another example of a directed graph,
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Example of Directed Graph

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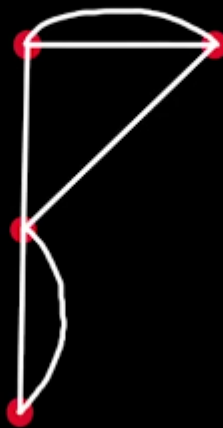


well, it must be clear to you now, what is a multi-graph? If two vertices have more than one edge then it is a multi-graph, this is an example of a multi-graph.

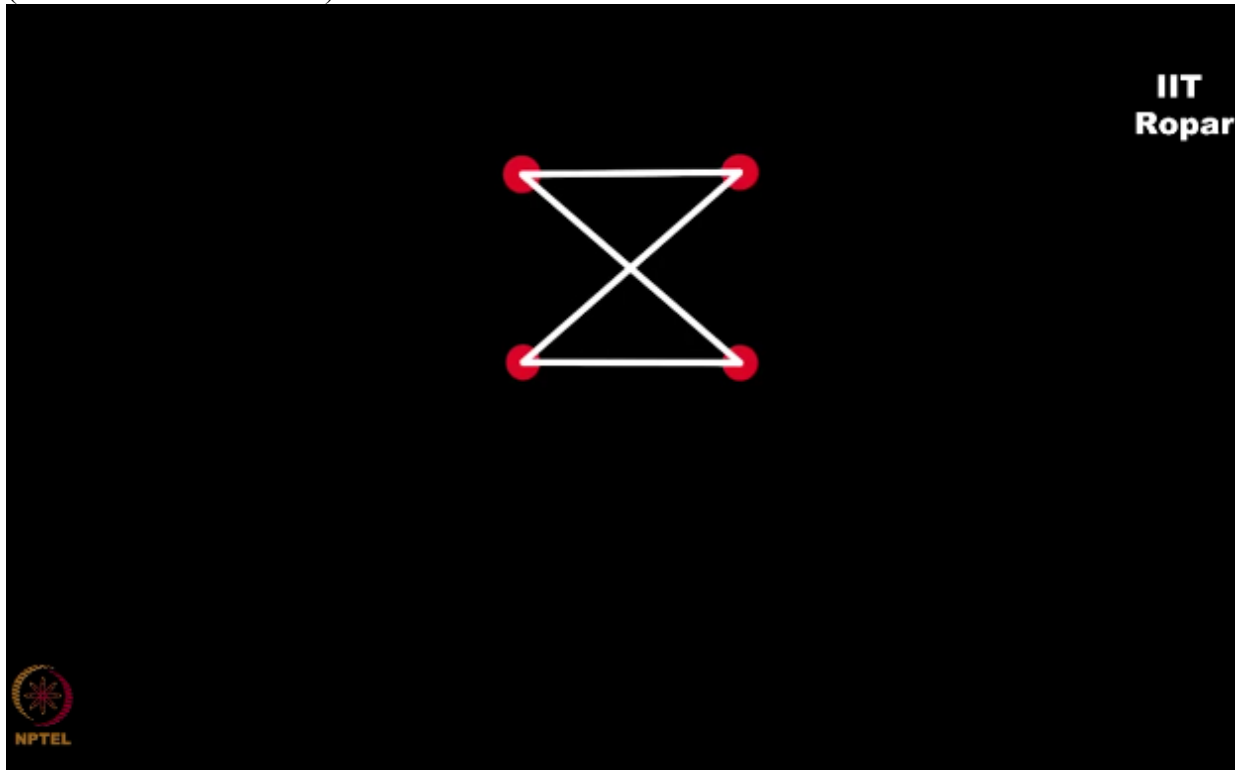
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Example of Multigraph

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Now the professor told what is a multi-graph, and what is a directed graph, but do you see that a simple graph like this,
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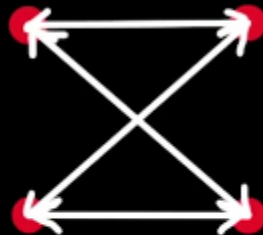


this is also a directed graph, the only thing is that it is bidirectional,
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Simple graph : Bidirectional

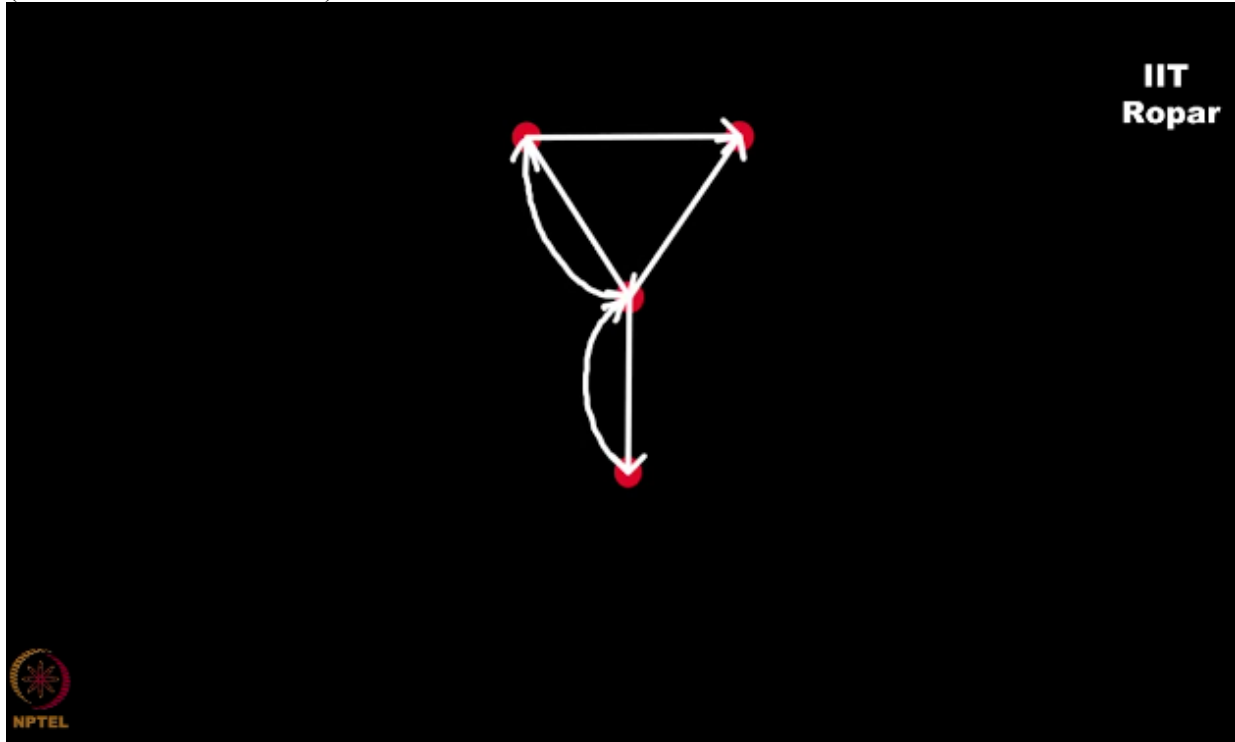
what do I mean by that? It has arrows like this,
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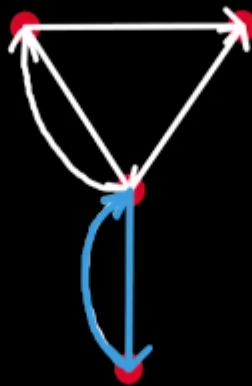
Simple graph : Bidirectional

you see arrow heads are on both the ends, but arrow heads on both the ends is equivalent to no arrow heads, we don't write it every time and hence a simple graph is a particular case of a directed graph, it's a bidirectional graph.

Now when I give you a directed graph like this,
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do you see that it's also a multi-graph, it's a multi-graph which is directed, in this case you see two edges here, directed edges, one is pointing this side, another is pointing that side,
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Directed Multigraph

now this can happen to, so these are some of the examples, most of the theorems which we discuss are for simple undirected graphs and it holds true for directed graphs as well most of them, but in case there is an exception then we will mention it explicitly, unless stated we will always discuss simple undirected graphs.

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