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**CSC 310**

**ASSIGNMENT (Interconnection networks 2)**

1. **Torus Interconnection Network**

Torus interconnect is a switch-less topology that can be seen as a mesh interconnect with nodes arranged in a rectilinear array of N = 2, 3, or more dimensions, with processors connected to their nearest neighbors, and corresponding processors on opposite edges of the array connected.

In geometry, a torus is created by revolving a circle about an axis coplanar to the circle. While this is a general definition in geometry, the topological properties of this type of shape describes the network topology in its essence. Each node has 2N connections. This topology got the name from the fact that the lattice formed in this way is topologically homogeneous to an N-dimensional torus.

1. **Hypercube Interconnection Network**

Hypercube networks are a type of network topology used to connect multiple processors with memory modules and accurately route data. Hypercube networks consist of 2m nodes. These nodes form the vertices of squares to create an internetwork connection. A hypercube is basically a multidimensional mesh network with two nodes in each dimension. Due to similarity, such topologies are usually grouped into a k-ary d-dimensional mesh topology family where d represents the number of dimensions and k represents the number of nodes in each dimension.

Hypercube interconnection network is formed by connecting N nodes that can be expressed as a power of 2. This means if the network has n nodes it can be expressed as :

N = 2m