Prediction tasks over nodes and edges in networks require careful effort in engineering features for learning algorithms. Recent research in the broader field of representation learning has led to significant progress in automating prediction by learning the features themselves. However, present approaches are largely insensitive to local patterns unique to networks. Here we propose node2vec, an algorithmic framework for learning feature representations for nodes in networks. In node2vec, we learn a mapping of nodes to a low-dimensional space of features that maximizes the likelihood of preserving distances between network neighborhoods of nodes. We define a flexible notion of nodes network neighborhood and design a biased random walk procedure, which efficiently explores diverse neighborhoods and leads to rich feature representations. Our algorithm generalizes prior work which is based on rigid notions of network neighborhoods and we demonstrate that the added flexibility in exploring neighborhoods is the key to learning richer representations. We demonstrate the efficacy of node2vec over existing state-of-the-art techniques on multi-label classification and link prediction in several real-world networks from diverse domains. Taken together, our work represents a new way for efficiently learning state-of-the-art task-independent node representations in complex networks.