The discrete scan statistic is defined as the maximum of moving sums of a given number of consecutive observations in a sequence of i.i.d. integer valued random variables. This thesis introduces various ways to approximate the distribution of the discrete scan statistic. These approximations are evaluated based on enumerations in specific cases. The main focus is on random variables with Bernoulli distribution, the only case where exact results for the distribution of the discrete scan statistic are available. Some connections with well-known problems as the birthday problem and the longest success run in a sequence of Bernoulli trials are also discussed.