Artificial Intelligence

Assignment – 2

1) *Understand and graphically represent the following search techniques:*
   · *Generate and Test*
   · *Hill climbing*

Generate and Test:

Generate and Test Search is a heuristic search methodology built on Depth First Search with Backtracking that, if used methodically and assuming there is a solution, ensures that a solution will be found. This method generates all possible solutions and tests them to find the optimal one. It guarantees that the top solution is compared to all other potential generated solutions.

It is also known as the British Museum Search Algorithm because it resembles randomly browsing the British Museum in search of a particular exhibit or artefact.

The generate and test algorithm generates all of the solutions systematically, thus the evaluation is done by the heuristic function. However, if there are any paths that are highly unlikely to lead to a conclusion, they are not taken into account. By ranking each possibility, the heuristic does this and is frequently successful in doing so. Systematic Generate and Test might not be successful in resolving complicated issues. However, there is a way to make improvements in difficult scenarios by fusing produce and test search with other methods in order to condense the search space. For example in Artificial Intelligence Program DENDRAL we make use of two techniques, the first one is Constraint Satisfaction Techniques followed by Generate and Test Procedure to work on reduced search space i.e. yield an effective result by working on a lesser number of lists generated in the very first step.
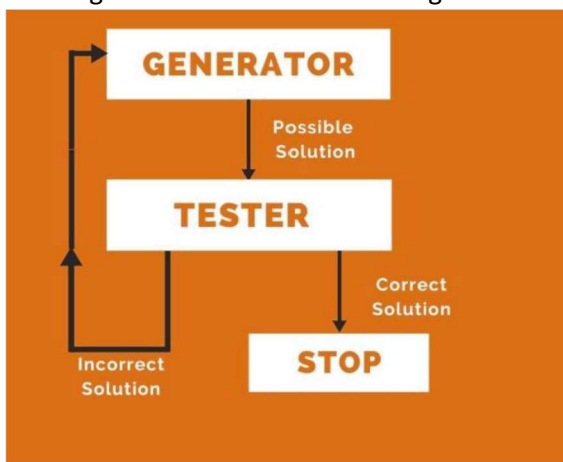

Hill Climbing:

Hill Climbing is a heuristic search used for mathematical optimization problems in the field of Artificial Intelligence. Given a large set of inputs and a good heuristic function, it tries to find a sufficiently good solution to the problem. This solution may not be the global optimal maximum.

In the above definition, mathematical optimization problems imply that hill-climbing solves the problems where we need to maximize or minimize a given real function by choosing values from the given inputs.

Example-Travelling salesman problem where we need to minimize the distance travelled by the salesman.
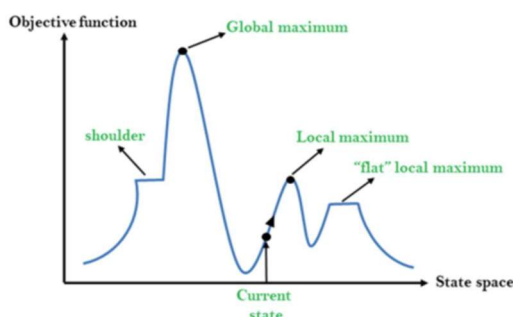
2) Prepare a Case study on how graph search is used for any one of the following AI based apps :
· Uber
· Facebook

Facebook Graph Search And It's Uses For Social

Marketing

Graph search is Facebook's inquiry engine that lets users enter natural-language search queries to find users who match a set of criteria. Searches can include criteria such as likes, shares, name, location, employer and more. Ecommerce merchants can benefit from this Facebook feature by using it to promote their sites via connections likes and shares. Companies can use the tool to discover their audiences insight into certain products and services, while also monitoring the reach of current influencers. *Keep an eye on the competition* While ecommerce sites can use graph search to gain valuable information about current and former customers, the most useful feature may be the ability to research competition. Businesses can search for not only their own name, but also competitive businesses to see what content and products are most widely shared. Based on these search results, enterprises will have a better idea of how popular their offerings are and what marketing methods are or are not working. With this information, ecommerce sites can reorganize their strategies and find better ways to engage with their client base. Mimicking their competition's methods will help merchants increase their following and consumer engagement, as well as their presence in future searches.

How to use graph search for marketing

With all its information, graph search is not a perfect inquiry engine. Keep the following best practices in mind to return the most relevant results:

• Use social media influencers to attract and engage new customers.
• Include relevant hashtags, keywords and overlapping interests.
• Develop new content that engages new and current audience, with special focus on evergreen content that doesn't go out of style and will continue to garner shares
• Research competition and their successful marketing tactics.

Stronger categorization

Facebook users and businesses alike were once frustrated by the limitations of the platform's search tool. In December 2014, however, the social media site released an updated version that allows people to search through posts, people, photos, places, pages and groups, etc, to find what they're looking for. Since the search is indexed by Facebook, greater priority will be given to results based on the strength of a user's relationship to his or her peers and the person. Utilizing the keywords entered into the search, the graph search gives answers based on the context and potential interest level of the user.

Improved targeting

Graph search allows ecommerce merchants to better organize and direct their marketing efforts. By paying attention to overlapping interests or popular hashtags, companies can target their efforts in a stronger way. Knowing what an audience is interested in or frequently uses as keywords enables businesses to find similarities in their own products and services that can be mixed in with consumer passions. Furthermore, using well-known keywords, hashtags and other references will make an enterprise's own information more relevant in future graph searches. A brand will reach a larger audience and become more visible in user inquiries by utilizing this information to the best of their ability.

3) Explain *Constraint Satisfaction* considering the following example problem.

CROSS

+ ROADS

———

DANGER

3)

$$CROSS$$
$$+ ROADS$$
$$DANGER$$

$S + S = R$

$S + D = E$

$O + A = G$

$R + O = N$

$C + R = A$

$D = 1$

$C = 9 \qquad R = 6$

$A = 5$

$R + O = N$

$O = 2 \qquad N = 8$

$O + A = G$

$G = 7$

$S + D = E$

$S = 3 \qquad E = 4$

$R = 6$