**Summary of approach to search types (based largely on Chapter 3 of Russell & Norvig, 3rd Edition).**

|  |  |  |  |
| --- | --- | --- | --- |
| **Search Type** | **Comment** | **When to check for Goal** | **Key checks carried out** |
| General Tree Search | * Generic approach to searching a state-space. Doesn’t deal with redundant paths | When nodes generated | * No check for previously visited nodes * No check for shorter paths |
| General Graph Search | * Generic approach to searching a state-space. Solves problem of redundant paths | When nodes generated | * Checks and only adds generated nodes to the frontier if they are not already in the frontier and not already in the explored set |
| Breadth First Search | * Root node expanded first and then all its successors and so on – shallowest first * Assumes each action has equal cost * Frontier is a FIFO queue | When nodes generated | * Checks and only adds generated nodes to the frontier if they are not already in the frontier and not already in the explored set |
| Uniform Cost Search | * Root node expanded first. * Nodes are ordered into the FIFO queue (to be expanded) on basis of the node having the lowest *path cost g(n).* | When nodes expanded (because the first goal node generated may be on a sub-optimal path). | * Checks and only adds generated nodes to the frontier if they are not already in the frontier and not already in the explored set * Checks if the generated node appears in the frontier with a higher-cost path and if so replaces the node in the frontier with the lower cost path. |
| Depth First Search  (graph version) | - This is an instance of the General graph-search (see above).  - Root node expanded first and then the *deepest* node in the frontier  - Frontier queue is generated on a LIFO basis where most recently generated node is chosen for expansion  - Often will invoke recursive calls | As per General Graph Search | As per General Graph Search |
| Depth-limited Search | * Like Depth First Search * Main difference is that a maximum depth is specified. If search hasn’t found the result at or prior to that specified depth, then it fails. | As per General Graph Search | As per General Graph Search |
| Iterative Deepening DFS | * Like Depth-limited Search * Main difference is that it iteratively increases the depth until a goal is found | As per General Graph Search | As per General Graph Search |