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MSCS

1st Semester

Section B

Binary Search

Working :

In binary Search algorithm the first step of working is

first arrang the array values by ascending order Then divide it into two paris and Then find The number of That is required If number is less Then The mid number control move to left side of array and find The required number. If number is greater Than The mid Then control mve to right side of The array and This process is continue untill required number is find.

Anatomy of Binary Search

Import Java.util.Array;

It is an external library which will import in our program. We can access all classes and methods by using this library. These are built-in-libraries that is already defined in our IDE. This are importat for every program that can be written in java.

Public Class BinarySearch

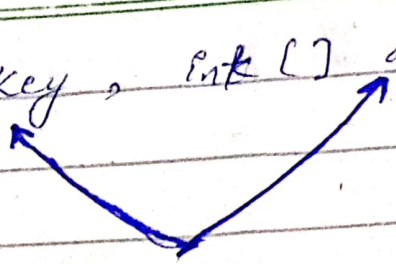
Name of class

This is the name of class that is "Binary Search"

Public Static int rank(int key, int[]a)

- return type that indiciate the integer value.
- Parameter type that is also an integer value.

(int key , int [ ] a)



[is a parameter variable that can store the values]

```
int lo = 0;
```

This statement is initializing and declaration the values of a variable.

```
lo +(hi - lo)/ 2;
```

This statements contains of expression that is (+), and (-) and (/) that shows that the mathematical function are performed in this statement.

In this statements the while loop is work that repeat the statements until condition is false.

```
while (lo <= hi)
{
  int mid=lo + (hi -lo)/2 ;
  if (key < a[mid]) hi = mid -1 ;
  else if (key > a[mid]) lo= mid +1;
  else                   return mid;
else
}
```

return -1;

This statement indicate the return type of the value that is (-1)

---

if (key < a[mid]) hi = mid-1

This statement execute the compiler the check the condition if value of searching is less then mid then control move the left side of array and decrease the value by 1

else

if (key > a[mid]) lo = mid+1;

This statement check the value of mid if the value of mid is greater then the searching value then control move the right side of the array and increase by 1 in the index of array.

else

return mid;

But if the value is

equal to mid then control return the mid value.

Public static void main (String [] args) /

This is the main class of program the indicates the main class.

Array.sort (whitelist);

This statement call a method in a java library that is used to sort the array in ascending order.

while (!StdIn.isEmpty())

This statement call a method in our standard library need to download code that is used for sort the array.

```
if (rank(key, whitelist) == -1)
    StdOut.println(key);
```

method Name — parameter — parameter — Call a local method

If the rank method 2 parameters are being passed. So, here also 2 parameters have been passed. In 'if' statements, after checking condition it will be given values when you are searching in this array.

```
StdOut.println(key);
```

Class Name — Static Method — parameter Name

Graphical Represent of Binary Search:

Flowchart