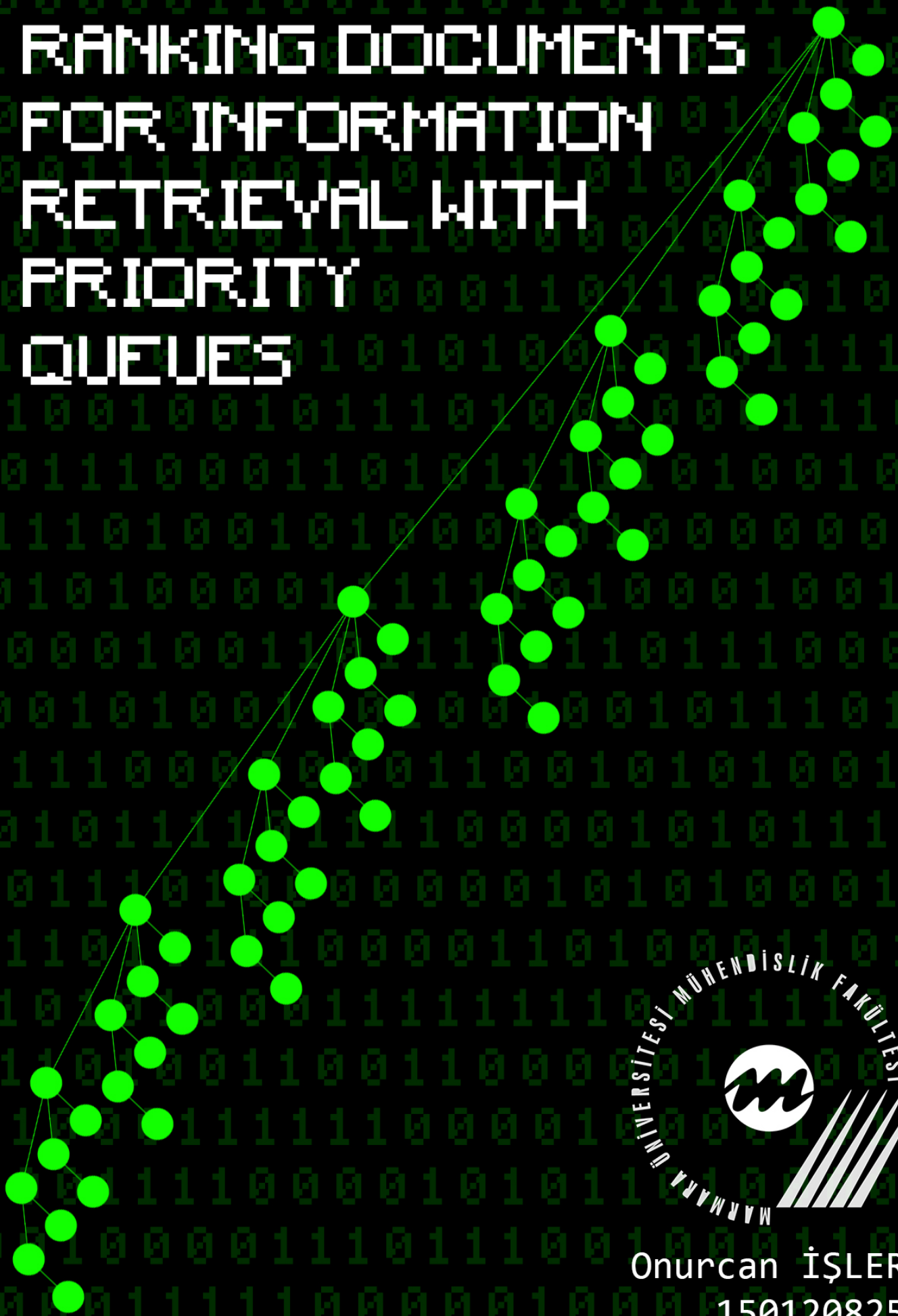
RANKING DOCUMENTS FOR INFORMATION RETRIEVAL WITH PRIORITY QUEUES



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CSE2025 PROJECT

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EXECUTIVE SUMMARY

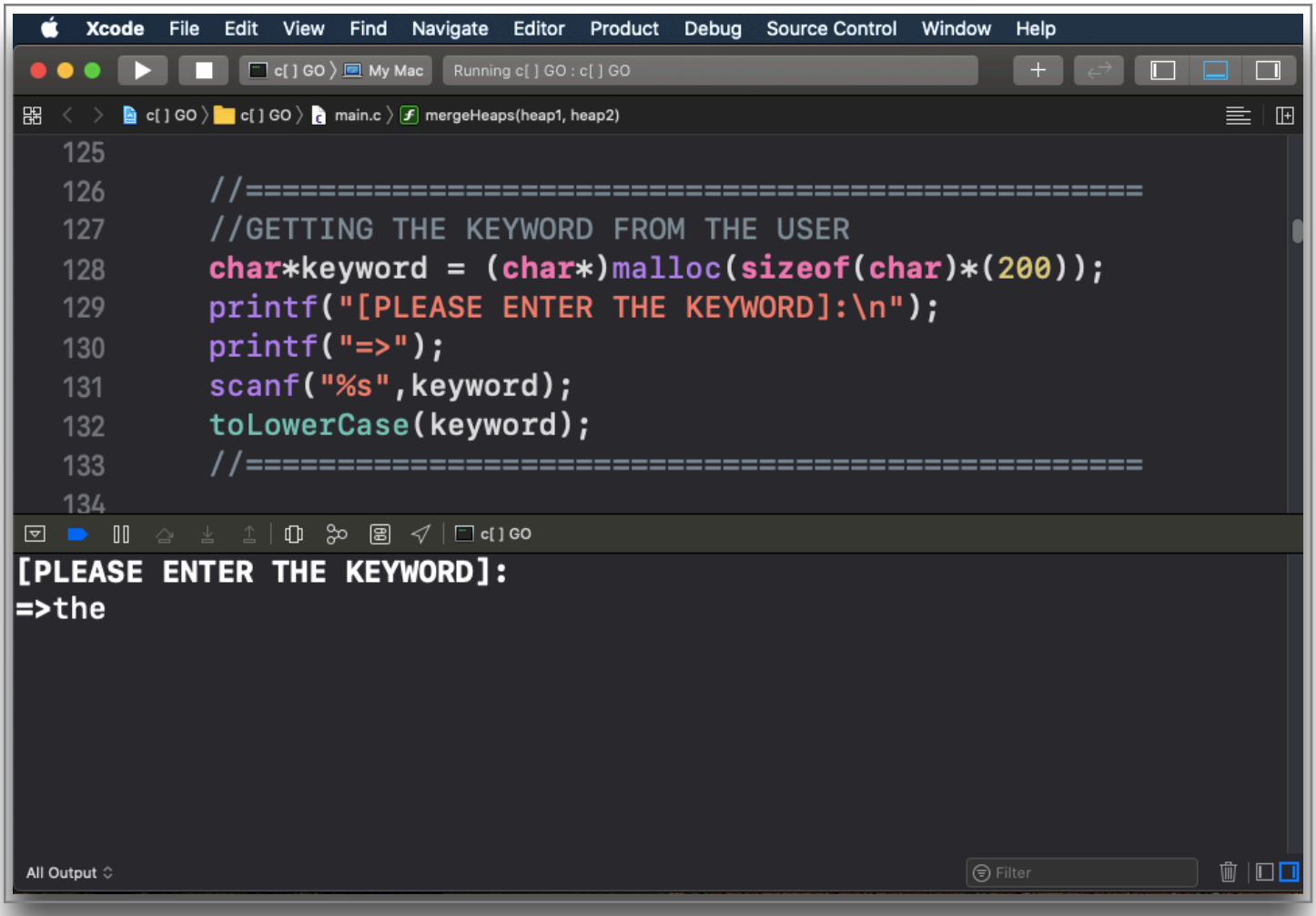
In this project, we have created a program detecting in which documents a given keyword is most frequently found. We have followed a simple process. We take a word from the user. We asked the user how many documents she would like to see and listed the most relevant documents based on the user's choices. To find in which documents the entered keyword appears most frequently, we have used a priority queue. To implement priority queue structure, we prefer to use binomial heaps.

In binomial heap structure we keep how many times a word occurs in a particular document *D*, and the particular document *D* itself. A document consists of a name and a text. We prefer to use maximum priority queues to operate this process since in a maximum priority queue, a document with higher number of keywords is served before a document with lower number of keywords.

GETTING THE INPUTS FROM THE USER

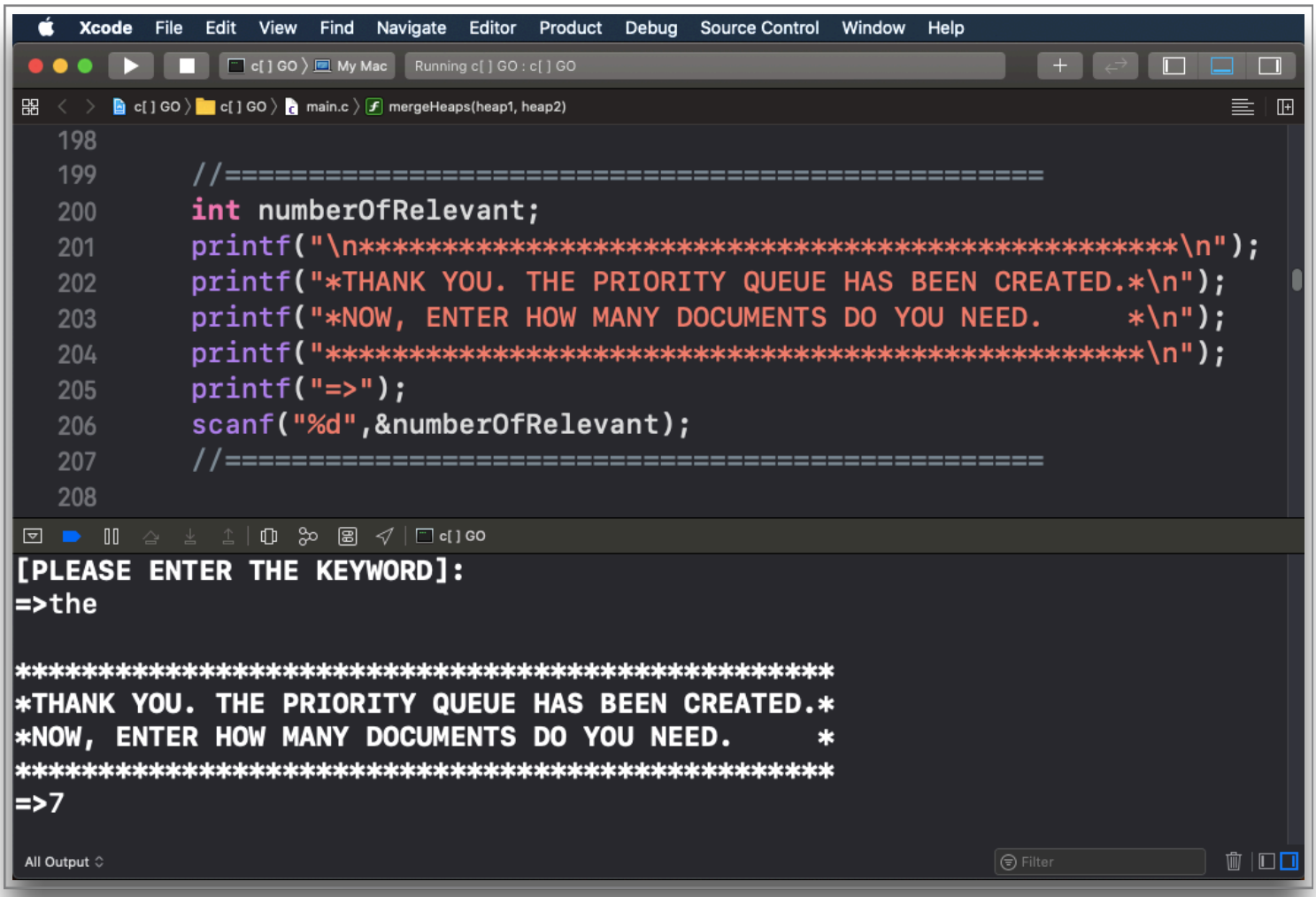
We first ask the user to enter a keyword that will be searched in the documents.

Figure 1: Taking the keyword from the user.



After the taking the keyword from the user we construct a maximum binomial heap according to how many times the keyword is appeared in each document. Now we can extract the most relevant documents. We let user decide how many documents to list.

Figure 2: Taking the number of relevant documents.



ENQUEUE AND DEQUEUE IMPLEMENTATIONS

In the implementation of binomial tree structure, I don't use parent pointer. Because in this project we don't actually use 'decreasing key' method in binomial heaps. So keeping the parent pointer is totally nonesense.

I have explained every single line of code I have written in this project. I have given detailed explanations about how the corresponding line of code works and why we need it. I have given asymptotic upper bound all the methods used in this project. You can find every explanation below. Since we enqueue an element by merging, I have written extra functions other than only enqueue and dequeue.

```
struct binomialTree{
    document*doc;
    int frequency;
    int k;
//I DON'T USE PARENT POINTER:)
    struct binomialTree*children;
    struct binomialTree*sibling;
};
typedef struct binomialTree binomialTree;
struct binomialHeap{
    binomialTree*head;
    int size;
};
typedef struct binomialHeap binomialHeap;

void attachSecondToFirst(binomialTree*first,binomialTree*second){//O(1)
    //We attach the nodes having the same degree. It is really easy.
    //Second becomes a child.
    second->sibling = first->children;
    first->children = second;
    first->k++;
}

binomialTree*mergeSortRoots(binomialTree*first,binomialTree*second){//O(logn)
    //This function takes root list of the binomial trees as a parameter.
    //The algorithm of this function is called 'mergesort'. We merge
    //two sorted root lists using two pointers. The resulting sorted root list
    //is also in non-decreasing order.
    //Since, in the worst case, there could be log2(n) number of roots at the top;
    //its execution time is O(logn)
    //The worst case occurs when n = 2^k - 1 where k is a positive integer.

    binomialTree*result = createBinomialTree(0,NULL);
    //When I read the algorithm in the CLRS book, I saw that there
    //were many edge cases we had to check:( Instead of all these checks,
    //I have used a temporary tree node so that we can apply operations directly.
    //This is my code, my choices:)

    binomialTree*tail = result;
    //'tail' will help us to insert the nodes. At the end of the root list.

    while(first!=NULL||second!=NULL){
        if(first==NULL){
            tail->sibling = second;
            break;
        }
        else if(second==NULL){
```

```
            tail->sibling = first;
            break;
        }
        else if(second->k < first->k){
            tail->sibling = second;
            second = second->sibling;
        }
        else{
            tail->sibling = first;
            first = first->sibling;
        }
        //We insert the node having smaller degree.
        //'tail' helps us to insert the node in O(1) time:)
        tail = tail->sibling;
    }
    return result->sibling;
    //result was temporary node...
}
void mergeHeaps(binomialHeap*heap1,binomialHeap*heap2){//O(logn)
    //It is like merging the forests. We only play with the roots
    //of the binomial trees. Since in a binomial heap with n nodes there
    //could be logn tree roots in the worst case, it has logarithmic
    //execution time.
    if(heap2->head==NULL){return;}
    //if heap2 is empty return heap1.
    heap1->size += heap2->size;
    //In my implementation, I want to keep the size of the heap.

    binomialTree*uniqueKs = mergeSortRoots(heap1->head,heap2->head);
    //Resulting tree node after merging forests. It is in non-decreasing
    //order but there could be multiple tree nodes having the same degree so
    //in following code will we find these nodes and we will merge them.

    heap2->head = NULL;
    heap2->size = 0;
    //We delete heap2. We don't need it anymore...

    binomialTree*prev = NULL;
    binomialTree*curr = uniqueKs;
    binomialTree*next = curr->sibling;
    //These guys will help us to detect consecutive nodes having the same
    //degree k.

    while(next!=NULL){
        if((next->k!=curr->k)||
           (next->sibling!=NULL&&curr->k==next->k&&next->k==next->sibling->k)){
            prev = curr;
            curr = next;

            //There are three consecutive nodes having the same degree or the
            //current pair have different degrees. So there is no problem
```

```
            //we can continue.
            //I want to share the reason why we skip when there are three
            //consecutive nodes.
            //Suppose degrees are like this:
            // 1 2 2 2 6 7 8
            //If we merge the first pair, we would have:
            // 1 3 2 6 7 8
            //Its degrees are not in non-decreasing order. It violates
            //binomial heap property.
            //We should merge the last pair:
            // 1 2 3 6 7 8
        }
        else{
            //Well... We have a problem now. We have detected consecutive pair having
            //the same degree. But we can't just merge them because we don't know
            //which root should be at the top and which root should be a child of
            //the other. Since we want to implement MAX BINOMIAL HEAP,
            //the node having BIGGER VALUE should be parent. The other should be child.

            //FUN FACT: Just changing that sign '>' to '<' would cause our heap to be
            //a minimum binomial heap.
            if(curr->frequency > next->frequency){
                curr->sibling = next->sibling;
             //Curr becomes the root of the next. The code below is important
                //since when next becomes child we would lose the pointer of the
                //next->sibling and we wouldn't be able to continue to process.
                attachSecondToFirst(curr,next);
            }
            else{
                if(prev==NULL){uniqueKs = next;}
                else{prev->sibling = next;}
                //When curr becomes child, the sibling of the prev
                //should be 'next' otherwise prev would point
                     //dangerous nodes (O_O)
                attachSecondToFirst(next,curr);
                curr = next;
            }
        }
        next = curr->sibling;
    }
    heap1->head = uniqueKs;
    //The binomial tree nodes are in non-decreasing order and unique.
}
void enqueue(binomialHeap*heap,int freq,document*doc){//O(logn)
    //We use merging to enqueue a single document.
    //As we have discussed earlier, merging takes O(logn) time. It is because,
    //in the worst case there would be log2(n) nodes at the top. The worst case
    //occurs when a binomial heap with n elements has the all possible trees:
    //B[0],B[1],B[2],B[3],...,B[log2(n)-1]
    //so worst case happens when n = 2^k - 1 where k is a positive integer.
    binomialHeap*temp = createBinomialHeap();
```

```
    temp->head = createBinomialTree(freq,doc);
    temp->size = 1;
    mergeHeaps(heap,temp);
}
int getMax(binomialHeap*heap){//O(logn)
    //To get the maximum frequency in the heap.
    int max = INT_MIN;
    binomialTree*maxFinder = heap->head;
    while(maxFinder!=NULL){
        if(max < maxFinder->frequency){
            max = maxFinder->frequency;
        }
        maxFinder = maxFinder->sibling;
    }
    return max;
}
binomialTree*reverseChildren(binomialTree*curr,binomialTree*prev){
    if(curr!=NULL){
        binomialTree*temp = curr->sibling;
        curr->sibling = prev;
        return reverseChildren(temp,curr);
    }
    return prev;
    //Reversing the children is important because each binomial
    //tree has decreasing ordered children. If we delete
    //the max element we have to reverse the children list so
    //that we can put children nodes back into the heap. If we
    //merge without reversing children, we wouldn't be able to use
    //merge sort algorithm consequently we wouldn't be able to put them
    //back into the heap.
}
binomialTree*dequeue(binomialHeap*heap){//O(logn)
    int maxValue = getMax(heap);
    //Well this is my code and my choices... In CLRS book there
    //were two extra pointers holding the previous nodes of the
    //node to be deleted. But instead, I have used my own way. I
    //got the node to be deleted before the operations. So we can
    //delete it easily.
    //IT DOESN'T CHANGE THE EXECUTION TIME since O(logn+logn)=O(logn)

    binomialTree*maxNode = heap->head;
    binomialTree*tempHead = createBinomialTree(0,NULL);
    //It will help us to keep previous node.

    tempHead->sibling = maxNode;
    binomialTree*prev = tempHead;
    while(maxNode->frequency!=maxValue){
        maxNode = maxNode->sibling;
        prev = prev->sibling;
    }
    //Both max node and the previous of the max node is found.
```

```
    prev->sibling = maxNode->sibling;
    //Max node has been removed from the root list. But we should
    //put its children
    //back into our heap.

    heap->head = tempHead->sibling;
    binomialTree*childrenOfMin = reverseChildren(maxNode->children,NULL);
    //Children has been reversed and now degrees are in non-decreasing order.

    binomialHeap*helpMerge = createBinomialHeap();
    //A temporary heap to merge the children.

    helpMerge->head = childrenOfMin;
    mergeHeaps(heap,helpMerge);
    //Children have been put back into the heap.
    heap->size--;
    return maxNode;
}
```

OUTPUT OF THE PROGRAM

Assuming the keyword is "the" and the number of relevance words is 7, we have had a output as follows:

```
[PLEASE ENTER THE KEYWORD]:
=>the

************************************************
*THANK YOU. THE PRIORITY QUEUE HAS BEEN CREATED.*
*NOW, ENTER HOW MANY DOCUMENTS DO YOU NEED.     *
************************************************
=>7

************************************************
*THANK YOU. THE RELEVANCE ORDER IS AS FOLLOWS:  *
************************************************
content_457408286340(175),content_611464941188(81),content_6143510
81092(68),content_625611869828(48),content_585649196676(47),conten
t_642921434756(44),content_617442086532(34)
```

****
* PRINTING THE DOCUMENTS *
****
1.[content_457408286340|175]:
Pros:Best black level and best handling of motion, stylish frame, natural colors Cons:None found The Bottom Line: Don't buy a big screen TV without considering the Sharp Aquos line!
When I remodelled my house, I created a dedicated theater room. Of course, the center of any theater room is the theater, or big screen television. I did a LOT of research before buying, including the agonizing study of dozens and dozens of televisions and trying to divine the ancient mystery: Plasma or LCD? Before you plunk down thousands of dollars for anything, you really need to do your homework. The first part of this review discusses LCD versus Plasma, and if you are already up to speed on such things, you can skip down. But I felt it was important to give you the benefit of my research if you are approaching this decision for the first time. My new theater room is 13 wide by 16 deep, with two level seating. The first row, where the wife and I sit, is 11 feet from the screen. Be sure to sit and look at the sets at the same distance you will be in your home. Bring a tape measure! Ideal height is to put the center of the picture just slightly above eye level. Avoid putting any tv high on a wall where you will have to look up to watch it. As most of you know, Plasma owned the market until recently. LCDs have come a long way in the last few years. You can google "Differences between LCD and Plasma" and get hundreds of hits, but to summarize, plasma tvs use pixel cells that are excited by electric current to basically glow a certain color (red, green, or blue). These pixel cells (which are like a tiny light bulb) are separated by black bars. This is the way traditional tube sets work except that in older tube sets an electron beam strikes a colored phosphor on the inner tube to create the light. Plasma sets had a reputation for "phosphor burn" which means if an image is on the screen too long in one place, it would permanently burn into the screen, and create a dark area. Additionally, plasma sets in the cheap range sometimes exhibited an audio buzzing during bright scenes. Burn in was not an issue with LCDs, but I believe newer plasmas have also solved this problem. LCDs use a "backlight" source of white light, which is "allowed" to pass through to certain colors. This was the early limitation of LCD response times, since the speed at which a Thin Film Transistor (TFT) can open or close determines how well the TV could handle fast action with clarity. So black levels on an LCD can be quite dramatic, because the TFT design can deny all light coming through. With Plasma, sometimes the black levels appear a bit grayish. But behind every LCD "black" spot is still a brightly lit backlight! Another issue is reflections. When viewing the set with lights in the room or sunlight coming in, can you see reflections in the screen that compete with the picture? Many plasma sets have very shiny screen surfaces, which reflect light. LCDs often have more of a low gloss screen, and can be less susceptible to reflected light in the vicinity. So back

to my dilemma. LCD or Plasma. Well, by the time I bought my tv back in June of 2008, LCD response times were so good (around 4 milliseconds) that the Sharp model being reviewed here now boasts 120Hz frame rate conversion. What does that mean? Well, in short it means the set can reproduce fast action without blur, or without jerkiness associated with panning effects. The best at doing this is the Sony MotionFlow, but the cost of their equivallent TV (70 inch) was almost $30,000.00 when I bought mine, so it was out of the question. At that time, Sony only offered a 52 inch and a 70 inch. The 52 inch was around $4,000.00 and the 70 inch was eight times as much! For a long time I thought that I should simply save money and go with the 52 inch. I'm glad I went for the 65 inch size. Size does matter! At first, I thought 65 inches would be too big. If you are used to watching a small 35 inch tube set, as I was, you need to get used to the bigger screens before making that decision. However, let me say that I found the Sony MotionFlow produced an image that was sort of hyper realistic, sort of 3D looking. Their demo of a moving merry-go-round really makes the point, but in order to achieve completely blur free images during fast motion, the "computer" in the TV has to make some guesses as to what is going to happen next. Don't get me wrong, MotionFlow is an interesting technology, but the Sharp TV is so good, you really don't need to spend extra bucks to get MotionFlow unless you really like the Sony picture best anyway. So LCD or Plasma you ask? I read many reviews and blogs on this, and could not come to any definitive conclusion one way or the other. The only way to settle it was to go SEE some sets side by side. I went to Best Buy, Costco, Sears... basically anywhere I could see the TVs. I saw, during my investigation of Plasma sets, that during fast motion, many plasmas had a green blur that was just behind the moving image. I did not see anything like that with the newer LCDs. Beware of sales people trying to push you toward a particular model. Sales people often knew less than I did, and would tell me things I knew were not correct to encourage the purchase of the model that was on their "Sell" list for the store. In my town, we have a company called Pacific Sales, which is a subsidiary of Best Buy. This is where I finally made my purchase. The staff of their theater section is very very knowledgable, and allowed me literally hours of watching the sets, asking questions, and coming back week after week until I decided. There was no pressure and lots of great information, as the sales person was familiar with all the features, including advanced settings. Based on my personal taste, I decided LCD was the way to go. Now what brand? I have owned several small Sharp Aquos (13 inch) tvs, and they had the sharpest picture of the models I tested. The final determination came down to Sony or Sharp as the best of the best, but the big screen Sony was out of my league price wise. Final determination was the Sharp LC-65SE94U for it's outstanding picture. It offered two things I really wanted. First the blackest black levels and, short of the WAY expensive Sony, the best handling of motion blur and film conversion (24 frame action). Take my word for it, no picture

looks realistic unless blacks are very black. It's stylish and non-reflective black matte case and non-reflective screen sealed the deal. Most large screen TVs are what we call FULL 1080 HD, which translates to 1920x1080 resolution (that's the number of pixels horizonally and vertically). The more pixels, the sharper the image. Now does every TV need this much resolution? No. With smaller sets (i.e., below 42 inch), the human eye does not need so much precision, since the screen is smaller. In smaller size sets, you can get away with "medium" HD, or 720p, which is much less expensive and although still HD, will list as 1366x768. However, when you are talking about TVs above 42 inch, the larger screen size will require lots more pixels in order to look crisp. You may or many not notice 720p in a smaller set, but you certainly will in larger screen sizes. In big screens, 1080 is the only way to go and with the cost coming down, it will soon be the standard for all sets I believe. A common question is what is the difference between 1080p and 1080i. The short answer is "not much". It is simply the difference between whether the picture is made by drawing each individual pixel (P) or by interlacing screens like older televisions do (I). Blu-ray supports 1080p. Most cable systems currently offer only 1080i, but it all looks great. A few comments on buying big screen tvs. The price is negotiable. When I first looked at the Sharp 65 inch, the best price offered was around $7,500.00. I went to several places and mentioned the other guy's price. The second guy offers the set at $6,900.00. I went back and forth, and by the time I was done, the price I paid was $5,900.00 (all within a month), so it pays to take your time and work the price. Of course, today the set sells in the $5,000.00 range but that's the nature of technology. I wanted it back in July, not 7 months later! So once I made the best deal I could, I anxiously awaited my new TV delivery. I did the wall mounting myself, and I had prewired the room for dolby 5.1 surround sound. I turned the TV on, selected the Planet Earth blu-ray disk, and it literally knocked my socks off. Of course, I had looked at the floor model at Pacific Sales for a month off and on, but in my theater room, I was in awe. This picture was nothing short of incredible. With LCDs, like the set I am reviewing, the angle of viewing is virtually from side to side without loss of image. This is not necessarily the case with plasma. High definition programming is precise. But an issue I worried about was how would low definition programming look. Some HD sets look absolutely awful when displaying older TV programs. Not the Sharp set. You can certainly tell what is and is not HD, but it's much better than I thought it would be. Normal DVDs (not blu-rays) are very good looking. The setup was simple and intuitive. The set offers FIVE HD inputs including 3 HDMI cable inputs, so there's plenty of connection points. Watch out for sets that offer only 2 HDMI jacks, as most everything is going HDMI for connectors. I had a cable TV HD box, so I simply hooked up the HDMI cable and my blu-ray player, and I was good to go. For my sound system, I used the variable audio output from the tv to feed my dolby 5.1 audio

receiver, which allows me to control volume in the room without having to use a separate remote for the receiver. The connection points are conveniently located on the under side and on the right edge, out of sight, but easy to get to without removing the set off the wall mount. A couple of interesting features. The TV allows you to turn off the picture, but still stay powered on, for example, if you want to make the room dark but listen to a music video or music only channel. The TV screen can be turned off while the set is on. This saves the back light. Even though the set is rated for 60,000 hours back light life, you want to conserve the backlight whenever possible. Remember, that whenever the set is turned on, even when the screen is black (like when the cable box is on screen saver), your backlight is lit. Other features that are nice include full control over color saturation, but frankly, I just "plug and played" this baby, and I did not have to tinker with any "advanced" features. To suit my taste, I turned the brightness down a bit--it looks more natural and saves the wear on the backlight. It also has a feature that allows the brightness to adjust to room ambient light. In a bright room, it brightens up and if the room is dark, it darkens slightly so the set is not too hot looking. This feature works very well and I leave it on all the time. The colors on this set look good right out of the box. It also will "sync" with an HDMI source. This means that when I put a Blu-Ray disk in my Sharp Blu-ray player, the TV automatically changes input source to the blu-ray so that when the blu-ray is ready to play, the TV is on that input and ready to go. Nice. You can re-label inputs to custom names (instead of generic "INPUT 5"). Another feature is the ability of the set to connect to the internet. I have not used this feature, but the instruction manual shows how the screen becomes basically a virtual keyboard. Of course, you can connect USB devices and games. I can only imagine what a video game would look like at 65 inches! This is also something I have not tried yet. The TV comes with its own speaker grill, which fits below the TV frame on the bottom, but no self-respecting audiophile will consider using them. However, if you don't have a quality surround sound system, you don't have to buy speakers. If you buy this big a set, I presume you have the best speakers and a great receiver. I left the speaker grill off the set. It looks better. The set has a built in digital tuner, so you can get the new off-air digital signals, but I presume you will have HD cable TV or HD satellite TV, so you won't be using the built in tuner anyway. One last piece of advice. These sets are heavy (112 pounds) and bulky, so you really want to buy from someplace you can drive to. Ordering on the internet sounds appealing to save a few bucks, but consider the hassles and cost of shipping this bad boy back if it comes not working or breaks during the warranty. Do yourself a favor and buy locally and also get an extended warranty for IN HOME repair, as you do not want to have to ship or carry such a heavy piece of technology. There are lots of features, but nothing that isn't found on other televisions, so if you are considereing this TV or want to ask a specific question, don't

hesitate to comment and I will be glad to answer it. I've now been using the TV for almost 6 months. I have had no problems and my wife thinks this is the best purchase we ever made. I'm a hero, thanks to the Sharp LC-65SE94U. Thank you, Sharp engineers! SHARP SPECIFICATIONS: _____ AQUOS Net delivers customized Internet content and live customer support via Ethernet, viewable in full-screen, split screen or sidebar format. Full HD 1080p (1920 x 1080) Resolution for the sharpest picture possible. Next-generation 10-Bit ASV LCD Panel from Sharp's Kameyama factory, producing a 27,000:1 Dynamic Contrast Ratio and a 4ms response time. 120Hz Frame Rate Conversion for the ultimate in fast-motion picture quality. Cornerstone Design with space-saving slim bezel and thin profile for elegant placement in any room, featuring unique textured black finish. . Enhanced Black Level provides the deepest, most accurate black of any flat panel TV. Five-wavelength Backlight System enables the display of very deep greens and crimson reds, widening the available color spectrum. High Brightness (450 cd/m2) AQUOS LCD TVs are very bright. You can put them virtually anywhere — even near windows, doors or other light sources — and the picture is still vivid. Built-in ATSC/QAM/NTSC Tuners provide access to DTV and analog TV channels. AQUOS Link™ Function enables convenient control of an AQUOS Blu-ray Disc™ player via HDMI™ using the AQUOS TV remote. Five 1080p Compatible Inputs including 3 HDMI™ inputs (v 1.3 with x.v. color) and two HD component inputs. Specifications Screen Size 65" Class (64-33/64" Diagonal) Panel Type Advanced Super View / Black TFT Panel Pixel Resolution 1920 x 1080 Brightness 450 cd/m2 Viewing Angles 176º H x 176º V Lamp Life 60,000 hours1 Audio System 15W + 15W

2.[content_611464941188|81]:
Pros:Great picture quality, thin profile Cons:Price is more than most, media sharing sucks The Bottom Line: If you just want a TV for movies and cable, this one has a great picture. But if you're looking for a media center, forget it.
Size considerations The television is huge and for a while, I was concerned that it might be too big for our room. But after a couple weeks, we got used to the size. The TV itself is very thin (less than 2" thick) and would look great mounted on the wall but for some issues mentioned below. The stand is quite large and moves the TV about 6" away from the wall but allows the TV to swivel about 10-15 degrees. The 58.6" width makes it tough to find furniture to accommodate this monster TV. Along with its bulk, it's also not light and you'll need two people to move it. Picture quality The picture is incredible—clear, sharp, great contrast, and, with the correct settings, very smooth motion. Even though the refresh rate is only 120Hz, the LED backlighting and processor speed makes the apparent refresh even faster. At first, I thought

the whole 480 Clear Motion thing was a gimmick, but it is noticeably smoother during action scenes. The sharpness along with the large image size gives Blu-ray movies a three dimensional quality that truly immerses you, even without 3D turned on. The dynamic contrast and auto brightness/backlight works great, keeping the picture adequately bright for the room light level without sacrificing the black levels. Now I don't have to adjust the brightness to go from day to night. Connectivity Wireless connectivity is was not always reliable. I ended up getting another router to act as a repeater hub and connected the TV and Blu-ray player using ethernet cable. It works very reliably now. I do like the way the Anynet + HDMI-CEC works with connected devices. Even though I have a programmable remote, I find myself using the TV remote since it controls the connected devices, except for the stupid Comcast cable box. The AllShare media sharing is one of the worst implementations I've ever used. It doesn't work with my iPod, iPhone or any of the Mac computers that are on the same network. Using Plex as a server on my Mac and even though all of my music is in MP3 format, none of it is recognized by the television. None of the .MOV or .M4V files show up either. At the very least, I thought I could set up a nice slideshow of photos as background images during a party, but even a thumb drive full of standard JPEGs comes up as an unsupported file format. All of these same files play fine on my Sony Blu-ray player. As far as Samsung's media sharing goes, it's is a great idea, but completely fails to deliver. Apps The TV apps aren't very useful, except for Amazon Video and Netflix. Everything else requires additional fees and I figure we pay for enough between cable, Netflix and Amazon Prime. The web browser and search function are totally useless since entering alpha characters using the on-screen keyboard is slow and tedious. I've also read that the Samsung remote keyboard doesn't even work with the web browser, but I have yet to confirm that. 3D The 6500 Series is supposed to have 2 pairs of 3D glasses included. However, the 6550 do NOT include 3D glasses with the television, while almost every other series of Samsung 3D televisions includes at least two. Fortunately, this television works with the least expensive 3D glasses I've found: Samsung SSG-4100GB. About $20 a pair. The 2D to 3D conversion is only marginally better than standard 2D. Not worth having to wear the glasses. Minor annoyances The TV's built-in speakers are down-firing. It makes dialogue hard to hear. There also isn't an option to use the speakers as the center channel speaker like I had on my last TV. Considering how muddy voices sound, I suppose that's actually a good thing. The processor sometimes gets bogged down and it stops responding to the remote, especially when using the apps. Try to load any folder with more than a dozen items in it, and the TV appears to hang. Many features, such as PIP and closed captioning, only work when TV is the source. However, since I use a cable box, these features aren't available. The printed user manual is nothing more than just a setup guide. Any topic about the operation of the TV doesn't seem to be very thorough. Many of the topics have just a list of the options available with no

explanations for what each option does. Some of the connectors on the back of the set are recessed, others stick straight out the back including 2 HDMI, USB, the cable and ethernet connections. This makes it harder to place the TV flush against a wall unless you buy right-angle cables. Audio connections use a 1/8" jack instead of the usual RCA jacks or an optical connector. However, HDMI usually includes the audio. I can't comment on whether the audio return on the HDMI works, but it doesn't work on the optical output. Audio coming in on HDMI is stripped of surround channels when it leaves the optical output of the TV. There is only one control on the TV itself. A joystick that controls several of the TV's functions, but is not the most intuitive. The on-screen menu will immediately preview the changes made to picture, audio, network, etc., but the changes won't be saved until you press the enter button. This might escape you a couple of times before you realize you didn't actually save the setting.

3.[content_614351081092|68]:
Pros:Great picture, feature loaded Cons:Breaks, unable to be repaired by authorized repair repeatedly The Bottom Line: A feature filled television with wonderful picture quality and form factor but lasted only 3 months then was unrepairable. It was returned under warranty.
We purchased the Samsung UN55ES8000 as our primary TV in our family room. We decided on this set for its stunning graphics, beautiful form and numerous features. The TV itself is an LED TV with a 240MHz refresh rate and very good color out of the box that does not require too much modifications. First, the connectivity of the television is typical. Three HDMI ports with one capable of ARC, one for CEC, and one for DVI. There is also legacy component inputs as well as a direct coaxial input. Finally there is USB inputs and the TV has an expansion slot for future upgrades by Samsung. The overall formfactor was one of the reasons that we purchased the TV. It has a very thin bezel and overall thickness. At the bottom center of the television is a small Samsung symbol that glows when the television is turned on. At the top center of the television is a small camera and the IR receiver for the set. The television also comes with two remote controls. A standard button remote and a touch interface remote. Both performed equally well. On the rear of the television is a control pad for cycling through the menus for use without a remote. The software features of the 8000 is plentiful. It can be directly connected to the internet by ethernet or wireless. Setup is simple through the menus. The internet connection gives you the ability to access youtube, netflix, hulu, etc directly through the television as well as the ability to use Samsungs phone remote apps. The unique features of this television is the motion control and voice command control. You can activate

the motion control and use hand gestures to adjust menu items, volume, etc. The voice feature is similar except it responds to your voice commands. The first 3 months we had this television there were no issues. The voice control was convenient especially if we didn't want to hunt down the remote. The motion control was fairly useless. This may be due to the position of the television and the brightness of the room the set was in. We were extremely pleased with the picture quality of the set. 3 months into owning the set is when the gremlins began appearing. At first, there was the occasional freezing of the screen followed by the set powering on and off spontaneously. Over the course of two weeks, the television began doing this continuously and was unwatchable. The only way to stop the process was to unplug it. Samsung sent a repair service to fix the set and they replaced the main board. The set worked for under 12 hours before it began having the same issues again. Again Samsung sent the TV back for repairs and they again replaced the mainboard. On return of the set, the television worked for 8 hours before the problems began again. Samsung customer service finally issued a full refund for the set. The repair and return process from the onset of the problem took about two months. We have never owned a Samsung TV set before and unlikely to buy another set. I don't know if we just received a bad set but, it was not a good sign when the return freight shipper stated this is the 30th Samsung set of this type theyve had to pickup and send back to Samsung.

4.[content_625611869828|48]:
Pros:Built in WiFi, USB Port, bright and colorful display Cons:Viewing angle, motion performance The Bottom Line: Overall, the ES6100F offers a descent performance, many connectivity options and the Smart hub is a great addition to this TV.
Design The Samsung ES6100F is a slim TV with beautiful design and is packed with a decent amount of connectivity options. Overall, the Samsung ES6100F is smartly built, and has a lot of Samsung's best design ideas for 2012. On the back of the Tv you've a Jog Stick, pressing the Jog Stick while the TV is on will open up a quick menu, allowing changes to things like input, picture mode, or closed captions. The http://reviews.lcdtvbuyingguide.com/lcdtvpics/samsung/es6100-2445.jpg has a big central button for the Smart hub, two big buttons for the channel and for the volume, a full number pad and navigation buttons for navigation trough the menu and Smart hub. Connectivity On the back you've 3 HDMI inputs, 3 USB inputs, EX-LINK port for service updates, audio inputs for DVI (PC) and analog devices (3.5 mm) , a LAN input, digital output for SPDIF audio (surround system) and a coaxial jack input. The Samsung ES6100F offers a great connectivity hub that is easy to access thanks to the stands swiveling. Image and audio performance

The Samsung's ES6100F is a LED Fullhd TV, it's native 1080p picture supports all NTSC resolutions and formats. The image quality wasn't that great, but after calibration, coloration, contrast and black levels where almost perfect. Now the colors are vivid and accurate, and the contrast is very good. I noticed that the viewing angle isn't that good, but it's not a huge problem. I find the motion performance a bit lacking when gamin or watching something with fast-action events. Gamers might find this a deal-breaker but don't worry, it'll not ruin your experience. If you don't want to change the settings/calibrate, than I recommend "Movie" without "Motion Plus" as picture mode. This one has the best brightness, saturation and black levels. When I tried Dynamic as picture mode, I noticed that the brightness is too much, even in sunlight coming in from the side. The TV packs two down-facing 10-watt speakers. The volume is quite good, but the bass tone isn't that great, but it's enough for the most people. The audio is quite good, you've a lot of settings that you can change. But again if you don't want to change the setting you can use one of presetted modes, I found that Movie is again the best. The sound is than much more natural and clear. Smart hub The TV comes with Samsungs smarthub where you can download apps, browse the internet, watch youtube video's etc. Samsung's smart hub is the best smart platform, offering access to streaming content, browser, apps, connected USB devices and wireless connected devices. The menus are easy to comprehend and loads quickly. The browser is easy to use but navigating is quite slow, especially with the standard remote. Smart hub offers apps like facebook, netflix, twitter etc. They are easy to use but they lack a few functions. In the box you get the TV, the power cable, remote control, two AA batteries, and a quick start guide. The TV consumes about 90 Watt in film mode, that more than the average TV in the same price range. These are the settings that I used for calibration: Standard Mode Backlight: 10 Contrast: 95 Brightness: 45 Sharpness: 50 Color: 33 Tint: G51 HDMI Black level: Low Dynamic Contrast: Low Black Tone: Dark Flesh Tone: 0 RGB Only: Off Color Space: Auto Gamma: +1 ColorTone: Warm 1 DNF: Auto MPEG: Auto Film mode: Off Auto Motion: Clear LED Motion: Off

5.[content_585649196676|47]:
Pros:Lots of value for the price, great picture, lots of video adjustments. Cons:Really can't think of any. The Bottom Line: The LG 55LW5600 sports lots of well implemented features for the price. Video adjustments a'plenty for more hand on customers and enough internet content to replace a roku.
That I'm about to write a favorable opinion on the LG 55LW5600 is quite remarkable in light of my bias for plasma TVs. I've associated LCD/LED TVs with high contrast and overly-saturated imagery which was OK for sporting events, but ruins most anything

else. Electronic consumer stores like BestBuy have only reinforced my views by setting their TV's to display over-the-top contrast and saturated pictures. But when it was time to upgrade my ancient Panasonic plasma, I read a lot of articles on the web that convinced me that LCD/LEDs have come a long way, and LCDs had three features I particularly wanted: matte screens for superior display in brightly lit rooms, energy efficiency, and light weight for easy mounting. All that said, I'll briefly touch on the most salient features of the 5600. Image quality: The 5600 is capable of producing well balanced imagery. The default settings are too punchy, but LG has developed a reputation for providing a complete toolbox of picture controls, and the 5600 is no exception. Beyond the standard adjustments, you have access to two expert modes which give you adjustments such as 10 point color temperature settings. But the standard control settings provide more than enough control to produce a pleasing, natural, evenly lit picture. This plasma lover is impressed. In sunlight, it exceeds what my plasma can produce, and in dim light, it isn't too far off. Overall, a solid performer. My quick tuning advise: disable TruMotion (dejudder), reduce contrast down to 93, reduce sharpness down 58, set Local Dimming to high, and turn off super resolution.

A word about local dimming - you get what you pay for, and at this price, it isn't a sophisticated implementation. The lg 55 inch display has 16 zones... compare that to high end solution that would have 240+ zones in the same space, and you'll see that not all local dimming implementations are the same. Kudos for an auto-energy saving mode that works great. It dims the picture to match the ambient light brightness in the room. I keep it in that mode all the time, not just to save energy, but to get an image best tuned for the lighting conditions. Until video games embrace 3d, I have no use for this new dimension of viewing. I did don the glasses for one movie - the 3d effect was fine - even with mild off angle viewing. I am a proponent of passive 3d which allows for very simple, lightweight, and cheap polarized glasses. A pair is available for $10 - if I had kids, I wouldn't consider more expensive/complicated systems. Audio: What? Which is to say, weak. Ok for broadcast TV, but it can't handle dynamic sound that comes from movies. There are ports on the back to export the audio to an external amplifier. Use it.

One nice touch - the LG comes with an video/audio sync tuning menu control. Remote Controls: The 5600 comes with 2 remote controls and a remote control app that runs on your Android or Iphone device. One of the two remote controls is your typical button filled device. Works great. The second remote control is a minimalist unit that navigate menus using motion sensors. Basically a Nintendo Wii like experience. Not for everyone. But the smartphone App is amazing. It give you a touch pad experience which is great for navigating the 5600's internet suite. When you have to input text, the app pulls up your smart phone's keyboard, which is ten times faster to use than the TV's built in keyboard. Best yet, on my android, I can speak the text and it shows up on the LG - it really is an excellent feature. Internet Suite: Since

I already own a Roku, I wasn't shopping for a TV with apps. But I'm happy to say that LG's implementation of Amazon video store is so good, I've been able to move my Roku onto another TV. The internet browser in conjunction with the smartphone control app is actually decent for navigating news sites. It does have Adobe flash, but an older version that many video sites do not support. I wonder if they'll update that. You can connect to the internet via wire or a supplied USB wireless device (supports G & N protocols). Video Games: There is a video mode for games that shuts of all the tv enhancements to minimize game lag. Seems to work fine - I haven't noticed any lag. A Word About Size: 55 inches may seem a little excessive, but there is a point to this size, which is immersion. Wider angles of picture are more engaging than smaller - and preserve the illusion or experience of the program. If you are a movie fan, this point is very salient, and you'll find it takes the viewing experience to a new level. There are some admittedly self serving guides to how big a screen size you should buy relative to viewing distance, but there is a reason for it beyond just "bigger is better". I would suggest reading some articles on this topic on consumer review sites that you trust. Summary: The 5600 is overall a great, well integrated package. It can be adjusted to produce a very natural looking picture that looks great in both bright and dim lit rooms. The internet app suite is surprisingly useful, and features like the remote control wand and the smartphone remote control apps reflect great product design. Highly recommended.

6.[content_642921434756|44]:
Pros:Easy assembly, slim, clear picture, eco-friendly. Cons:Not 1080 HD. The Bottom Line: I would easily recommend this for a small room as long as 1080 is not a concern.
It was time to replace my old 20 inch tube television in the bedroom. It was very difficult to see things such as words and sports scores on the screen. I had some gift cards for Target and watched their ads until I saw this. I am happy with the Magnavox 1080p HD TV I purchased almost a year ago, and since Philips is the same company, that was a factor in my decision. Although the new 32 inch TV is only 720p, that is all I need for the bedroom. For the sale price of $229, I am happy with it so far. First, the television is very light and easy to assemble. A Phillips screwdriver is required to mount the stand with the three included screws, but one person can easily accomplish that task. The TV is also very slim, much slimmer than our 39 inch set. After the TV is set up and powered on, you can have it automatically search for channels, but this was not necessary due to our satellite provider. I had to “connect” the second TV using the Dish Network remotes and that was relatively simple. One very nice thing about this TV is the settings assistant. It shows a series images on

the screen and you select if you prefer the left side or right side better, much like being at the eye doctor. After the TV and satellite connection were hooked up, I noticed that the picture was not in HD even on the HD channels. It turns out that a second receiver is needed to accomplish this. Alternately, I could run a long HDMI cable, but HDMI does not travel well over distances. Even with the standard definition of 480p, the picture is still much clearer than the old box TV. Next, this TV is very eco-friendly. It uses LED's which are very energy efficient. The estimated annual cost of running the television is only seven dollars. The LED also makes the picture clearer. The screen refresh rate is 60Hz, but there is no real difference between 60 and 120. Like our 39 inch Magnavox, there is no shortage of hookups. There are three HDMI inputs, one composite video input, one component input, one USB input, and a headphone jack. Like all HD TV's, an antenna can also easily be connected to watch free over the air digital channels. The two Dolby Digital speakers sound just fine for the bedroom so no sound bar will be needed. The remote control is very basic and straightforward but I like the simplicity of it. The source can easily be changed from TV to DVD or computer if hooked up. The controls on the TV are sensors which it makes it very easy to turn the unit on or off or to change the source. To conclude, this is a great second TV or a great TV for a small apartment or living room, especially considering the price. Even when not in HD, the picture is very clear. It is very easy to assemble and set up and is very user-friendly. If you are in the market for a TV in this size range and are not concerned with the difference between 720 and 1080 and are not looking for a smart TV, this is a good choice.

7.[content_617442086532|34]:
Pros:EVERYTHING. Cons:Nothing. The Bottom Line: It is bloody awesome.
User Rating:ExcellentSound: Ease of Use: Picture Quality: Durability: Pros:Superior picture and sound. Cons:NoneNone The Bottom Line:Quality TV for a price that's too good to be believed. I purchased my Coby LEDTV 2316 23" Flat Screen TV right after the 'digital migration" rendered my old tv useless. I learned that to get a picture, I need to get a digital cable adapter. I was tired of the old bulky TV, and since I had to get a digital adapter anyway, I figured that I might as well get a new flat screen TV. I went down to Fry's electronics, compared the different TV sets, and decided on the Coby TFT LED 2316 model. On the way home, we picked up the cable box, and within minutes, I had a working TV in my study. The picture on the Coby LEDTV2316 is crystal clear and if the color is not just right, I go into menu and adjust thebrightness, contrast, colors, tint, and sharper bar in the center of the monitor to get the

picture I want. There are also choices for picture, audio, channels and settings. I love the fact that the TV is so light-weight. I have big desk, and the 23′ TV fit perfectly on one end. Since I couldn′t get the Coby remote to work with the Comcast Digital Adapter (it stubbornly refused to accept the different programmable codes) I needed two remotes. I use the Coby Remote for the On Off, Menu, and Volume functions, and the Comcast remote for Switching Channels. I save myself some frustration by putting yellow stickers on each remote telling me what each one does. The sound is especially good on the Coby TFT (my spouse is hard of hearing) but has no problem popping in my study and hearing what Rachel Maddow might have to say. As a writer of an occasional cable TV script, I need to watch a lot of TV to familiar myself with the specific needs of the various programs. Not to mention the occasional writer′s block; Nothing breaks a writer′s block quicker than getting away from writing and watching the news, or one of Bravo′s Real Housewives programs. I′m not exactly rich and I didn't want to pay a lot for a television for my study. Needless to say, I was thrilled to see that the cost of the Coby LEDTV, 23″ flat screen was $189.00! My old fat TV cost more than that. I′ve had the Coby for five months, and so far, I′ve not had one complaint. Other than the fact that one remote should be all that's necessary to operate your TV. But then again, that's not the TV's fault.
 # Recommended: Yes

Program ended with exit code: 0

DISSCUSSION

What is the advantage of using priority queue for such a problem?

When an average computer engineering student who had not heard of priority queues faced such a problem, she would probably follow a process like the one below.

- *Getting the number of relevant words k and a keyword.*
- *Finding how many times the given keyword appears in each document.*
- *Creating an array of pairs where a pair consists of the frequency of the keyword in the document and the document itself.*
- *And sorting the array according to the frequencies.*
- *Getting the first k documents and printing them.*

When we look at the steps she follows, we see that the time complexity of these operations is O (nlogn) since we are sorting the array of the documents. Actually as we have have discussed earlier, construction a priority queue is also O(nlogn). So why do we use priority queues then?

Of course we use priority queues because inserting an element into a priority queue is really fast. It so fast that, according to some of the resources I have seen on the Internet, insertion may take O(1) time if we prefer to use some efficient algorithms such as binomial heaps to construct this priority queue. This means that actually constructing a priority queue may take O(n) time, which is much faster than O(nlogn).

There is another reason. We use priority queues because sometimes we only want to reach a few elements which are the biggest or smallest elements of a given array. Assuming k is the number of relevant words, it would take O (nlogn + k) time to obtain the most suitable documents using the sorting algorithm, while using a priority queue it would take O (n + klogn) time. For small k, using a priority queue is much faster.

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