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CPT_S 223
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Unordered Complexities	Ordered Complexities
N	37
√N	2/N
N^1.5	√N
N^2	N log(log(N))
N log N	N
N log(log(N))	N log N
N log^2 N	N log^2 N
2/N	N^1.5
2^N	N^2
2^(N/2)	N^2 log(N)
37	2^(N/2)
N^2 log(N)	2^N

2.
a. x(20) = 35; x = 1.75; 1.75 * 100 = 175 seconds
b. x(20+log20) = 35; x = 1.643; 1.643(100+log100) = 167.598 seconds
c. x(20^3) = 35; x = 0.004375; 0.00438(100^3) = 4375 seconds
d. x(2^(20)) = 35; x = 0.0000334; 0.00003334(2^100) = 4.2312404*10^25 seconds
3.
The depth of a complete binary tree can be found using the equation $(2^{(depth+1)}-1)/(2-1)$. So the number of nodes in a complete binary tree of depth 5 should be $(2^{(5+1)}-1)/(2-1)$ which equals 63.
4.

```
int findDepth(Node *current)
{
	if(current == NULL)
		return 0;
	if(current→left == NULL && current→right == NULL)
		return 1;
	else
	{
		int leftDepth =  findDepth(current→left);
		int rightDepth = findDepth(current→right);
		if(l >r)
			return l++;
		else
			return r++;
	}
}
```

5.
amount is specified number of Fibonacci numbers

```
int fib(int amount)
{
	if(amount = 1)
		return 1;
	int a = 1;
	int b = 1;
	int total;
	for(int j = 0; j < amount; j; j++)
	{
		total = a + b;
		a = b;
	}
	return total;
}
```

6.
Git is a version control system that allows many people to work on the same codebase. Benefits of git include the fact that changes to the code have to be committed, and approved by the owner of the git server, as well as tracking changes overtime. Branching is another powerfull git tool, as It allows for certain parts of the code to be changed and tested independently.
7.
GDB stands for GNU Debugger, and it allows for easily see whats going on behind the scenes in a program up until the point of a crash.

Make is a tool used build C/C++ files, it requires a make file that specifies the commands necessary to compile and link files used in a program. Cmake is an abstraction of make, and allows for the user to simply state the files and libraries that are used, and Cmake will automatically create a make file with all the necessary commands. Cmake also keeps track of when files are modified and only compiles files when significant changes have been made.
8.
The argv variable is set with an array of Cstrings that are specified by the user when the program is run from the terminal. crgc is set to the length of the array of Cstrings. The first element of in argv, or argv[0] is always the command to run the program, which is usually ./program while the next arguments are whatever the user specifies. When running the program.