Q1

1. iPhone

Phones in our everyday life have its function of communicating with other people; People use a phone to call the other, send messages and/or sometimes send email to another.

   Because of the purpose and usages, typical phones are designed in a way such that there are buttons labeled with numbers and for each button there are 3 possible letters and there is a screen that users can interact. However iPhone has only one big touch screen, which display different screen depending on user input. There are several strengths in using touch screen on iPhone.

   First, it gives me a **freedom of movement**. Unlike other phones where a user constantly needs to press a certain button to use a certain application, iPhone requires users' finger movement on the screen to use applications. One of the examples is that if I want to go to the next menu, I simply need to put my finger and just flick it as if it was a book. I think it is a good example of both physical and perceived affordance.

   Second, iPhone provide some **double-safety feature**. To prevent a user from unintended cell phone usage(it could happen since the phone can be activated even by a single finger movement), at the home screen there is an unlock slide bar. iPhones main menu only shown by sliding the bar.

   Third, iPhone provides full **QWERTY** keyboard whenever users need to type. This applies to any application such as SMS message, Internet browsing, etc. Also when users need to type in number, the qwerty keyboard disappear and shows number keypad that is identical to one from keyboard or one on the phone depending on the application the users are using.

Besides its strength in interface, there are also weaknesses.

   First, **alarm in vibration mode**. When the iPhone is put on vibration mode, it is obvious that the users are in a situation where distraction is allowed. However it is not the case for the alarm and timer function in iPhone. Even if the phone is in vibration mode, the alarm will still go off with its normal volume.

   Second, **the QWERTY keyboard size**. It is obvious that having a QWERTY keyboard is useful but the size of the key is not suitable for a user like me who have a big finger. I continuously make mistakes while using the keyboard.

   Third, **the screen won’t rotate on certain application**. iPhone provides both portrait and landscape view which users can use them by rotating the iPhone itself. However there are few applications, which landscape view might be really helpful, but iPhone wont provide it; applications such as mail, SMS.
2. Customer Service ATM.

Customer Service is designed to easily guide customers to right directions on any information they look for. Unlike the other two interfaces above, Customer Service ATM is heavily used in work and/or our everyday life, since it is designed to answer questions regarding the usage of products. The fact that usages of customer service ATM are designed to assist customers' usage of products, it covers very broad area from simple home appliances to sophisticated applications. Due to the typical usage of ATM, there are designed with some strength in their interface, which makes it better than just talking to any assistant right away.

First, since for each product there could be many questions from customers, ATM is designed in a way such that the customers need to provide certain basic information. Customers need to provide product model and categories or type of questions and etc. By doing so, customers are more likely to talk to a right representative with specialty in that field.

Other is the constraint of options on ATM. Whenever using ATM, there are only 4~5 options to choose from at each step, and for each step, it narrows down to the subcategories(to the right topic). By doing so, it gives feedback to the customers and could assist the customers to a right place and help focus on their original issues regarding the products.

The last is the voice recognition. Knowing that while listening to the phone, its not easy to press a certain button, they provide voice recognition on the customers choice so that customers don't need to press the button. It is extremely convenience

Besides their strength, there are also weaknesses. Ironically, some of strengths described previously are also the weaknesses of their interface.

First, the voice recognition. It is extremely convenience when ATM recognizes the voice correctly. However when It cant recognize the voice, it is just a disaster. Customers are incorrectly directed and if "go back to a previous menu" function (which they usually don't) is not provided or recognized, customers just simply have to hang up and call it again.

Second, while holding on the phone and waiting for the representative, they periodically inform that the lines are busy, but there is no clear indication of expected waiting time.(some do but it is only at the very first). Customers simply have to wait or hang up.

The last and the biggest weakness is that you just simply can’t talk to the representative at all. Despite its purposes and easiness of use, many people are having hard time talking to the representative.
3. Alarm clock. My alarm clocks seems like it is intended for the frequent traveler since it is small and folds up very easily. Alarm clocks in general are widely used for various reasons and many areas.

There are some strengths in this alarm clock.

   First, the major strength is its mobility. Once it is folded, it is very small and easy to carry. So not only is it good for frequent travelers like me but also it does not take too much space in my room.

   Second, it displays some helpful extra information except for the time. It shows the date, and temperature (in Celsius or Fahrenheit).

   The last, despite of its size, the alarm sound goes off pretty loud. One of the main usage of the alarm clock is to make people wake up on right time and the alarm clock does it job amazingly.

Besides its strength, there are also weaknesses.

Since it is designed to be small, everything is small, especially the buttons. It is hard to set up a time or alarm without a sharp pin. It would have been better if buttons were big enough so that users can use them easily.

There is no snooze button. It is surprising that alarm clock does not have a snooze button. So if a user misses the alarm, chances are pretty big that they wont be able to wake up soon.

The battery cap is screwed tight. The cap for battery is screwed tight, a user needs to have a screwdriver to open it. It seems it was designed for frequent travelers but is there a screwed cap? It would have been better if it had a standard cap where a user does not need any screw driver.
Q2

One of the person in Computer Science answered that one of the features of Windows XP annoys him and interferes with his work; XP’s **notification on unused icon on the desktop**. It constantly pops up a small message box on the lower right hand corner. He says that it doesn’t affect his ability to get works done, but annoys him a lot. He thinks it might be better not to have those features since having unused icons can be managed by the users themselves if they think they don’t need one. Other is the application he is using; **Eclipse**. He says that Eclipse in overall is excellent but it is too heavy to use. It uses a lot of resources and sometimes it makes him hard to do simple multitasks such as reading the instruction manual while coding on Eclipse. It does affect his productivity since sometimes he just has to do one task at a time, either reading the instruction manual or code. He doesn’t think there is a design problem, but the resource management is a big problem and it is something that the entire team has to work with from the bottom to make it lighter. He also mentions about **Demo/Trial version software**. He says that to re-activate certain trial software, there are too many steps to follows such as email verification, re-activation code etc. It affects his productivity a lot, since there had been a case where he was trying to work on certain homework and project but the program refused to open since it was about to expire and he had to re-activate. He mentions that all those re-activation or first trial step has to be as simple as possible. For example, instead of asking users to put certain information, there should have been an embedded activation part so that users simply need to have Internet connection.

Other person answered that the most amazing feature, **exposé**, in Mac interferes with this productivity. He mentions that even though he frequently uses exposé, OSX does not have exposé feature in each monitor when dual monitors are used. The computer recognizes two monitors as a whole; he cannot specify exposé command on the corners where the two monitors meet. Therefore he has to move around the monitors to activate the exposé and it annoys him and interferes with his work a lot. He says he would have made exposé recognized in every physical edge of each monitor so that users can easily use exposé. Another is the mighty mouse. He says that even though the **mighty mouse** has a great sensibility and easy grip for long time of work, the click button on the mouse wont go deep enough, he often feels confused whether the click was performed. Therefore he needs to click certain files more than twice sometimes. He says that he might consider making a click button going a bit deeper so that users know that they actually click. Another is the **navigation ball on the mighty mouse**. It is designed to work on OSX environment perfectly but dirt goes into the mouse and ball wont be able to perform scroll in any or one certain direction. Even if he wants to open up and fix it, Apple made it in a way such that normal users wont be able to open the mouse easily. This design flow leads to low productivity and he says he would have made the mouse with a small touch pad navigation instead of ball.
Another person mentioned about his Belkin keyboard. The keyboard is designed in a way such that every key has a small concave shape. But due to the shape when he uses the keyboard he consistently makes mistake by pressing the button next to it. If he does not want to make a mistake, he has to pay extra attention while he is working. He says that this really frustrates him and lowers his productivity a lot. He says that he understands the reason of the shape, but it is just not efficient. He says that if he were to design a keyboard, he would simply focus on the keystroke. He also mentions about the default Windows Vista’s feature; authorization. Vista has the authorization thing by default where when users want to install something that is not “authorized” or Microsoft (thus considered to be an unsecure), it momentarily freezes and asks if a user wants to proceed. He recently finds out that he can turn it off, but he says that this features interferes with his works and he says if he were to be the designer of Vista, he would not make the feature running by default but rather ask users what they would like to do at the very first time when they use the product. Other thing he points out is the TV menu. He says he likes to watch TV and sometimes go through the TV menu available from the TV but the remote control and the TV menu are not quite compatible. There are so many buttons on the remote control but the menu does not specifically say what to press when he wants to a certain thing. This does not interfere with his productivity at all, but it makes him frustrated sometimes, because he has to go through all those hassles when he decides to sit and take a break. He says that if he were to be a designer, he would make a remote control simpler or make a section for controlling menu.
Q3

\[ T_n = 3267\text{ms} \]
\[ T_1 = 30436\text{ms} \]
\[ N = 25 \]
\[ T_n = T_1 \times 25^{-\alpha} \]
\[ \alpha = .70 \]

While doing the study, the subject showed a certain pattern for each trial. The subject took a lot of time before trying his first trial. After his first incorrect trial, he seemed he was trying to memorize each character and seemed the backwards order lost the meaning to him when he was continuously succeeding the trials.
import java.io.*;
import quicktime.std.clocks.TimeRecord;
public class CS465HWK2 {
    public static void main(String[] args) throws IOException {
        BufferedReader br = null;
        BufferedWriter out = null;
        BufferedWriter xls = null;
        String inputstr = null;
        long start = 0;
        long finish = 0;
        long diff = 0;
        System.out.println("Type the last 8 letter of the alphabet backwards");
        System.out.println("::30 trials correct required::");
        System.out.println("After each trial, it will show where the previous trial was correct");
        System.out.println("and tells how many correct trials remain");
        System.out.println("Press enter when ready to start.");
        System.in.read();
        br = new BufferedReader(new InputStreamReader(System.in));

        //create output file
        try {
            FileWriter fstream = new FileWriter("result.txt");
            FileWriter xlsdata = new FileWriter("result_data.xls");
        }
        catch(Exception e){//Catch exception if any
            System.err.println("Error: " + e.getMessage()); }

        //start the program
        for(int i = 0; i<30; i++)
        {
            System.out.print("trial #" +(i+1) +": ");
            start = System.currentTimeMillis();
            br = new BufferedReader(new
InputStreamReader(System.in));
    inputstr = br.readLine();
    finish = System.currentTimeMillis();
    diff = (finish - start);
    for(int j=0;j<30;j++)
    {
        System.out.println("\n");
    }
    try
    {
        out = new BufferedWriter(new FileWriter("result.txt",true));
        xls = new BufferedWriter(new FileWriter("result_data.xls",true));
        if(inputstr == "zyxwvuts")
        {
            out.write("trial #"+(i+1)+": "+inputstr+" (correct), "
            +diff+" milliseconds taken");
            out.newLine();
            out.close();
            xls.write("trial" + (i+1) + "\t" + diff);
            xls.newLine();
            xls.close();
            System.out.print("corrett");
        }
        else
        {
            out.write("trial #"+(i+1)+": "+inputstr+" (incorrect), "
            +diff+" milliseconds taken");
            out.newLine();
            out.close();
            xls.write("trial" + (i+1) + "\t" + diff);
            xls.newLine();
            xls.close();
            System.out.print("incorrett");
        }
    }
    catch (IOException ioe)
    {
        System.out.println("IO error trying to read!");
        System.exit(1);
    }
    out.close();
Q4

(a) Reaction Time = \( a + b \log_2 N \) where \( a = 548, b = 420, N = 12 \)
\[
RT = 548 + 420 \times \log_2 12 = 2053.68 \text{ ms}
\]

(b) \( 50/50 = 0.5(548 + 420 \log_2 4) + 0.5(548 + 420 \log_2 8) = 1598 \text{ ms} \)
\[
75/25 = 0.75(548 + 420 \log_2 4) + 0.25(548 + 420 \log_2 8) = 1493 \text{ ms}
\]
\[
90/10 = 0.9(548 + 420 \log_2 4) + 0.1(548 + 420 \log_2 8) = 1430 \text{ ms}
\]
Minimum choice time is when there is 100% probability that the item is in the dynamic area of the menu, \( 548 + 420 \log_2 4 \), resulting in 1388 ms.

Maximum choice time would occur at 100% static probability that the item is in the static area of the menu, \( 548 + 420 \log_2 8 \), a 1808 ms turnaround time.

(c) Although Hick's Law is an interesting measurement, the constants \( A \) and \( B \) are “empirically determined”, meaning that it will be off when experiment fails or experiments requires certain performance that cannot or not easily performed; such as experiments related to mentality. Therefore I believe that the limitation of the Hick's law is that it can only be applied to some cases where there are movements that we can quantize.