



California State University, Sacramento
College of Engineering and Computer Science

Computer Science 35: Introduction to Computer Architecture

Fall 2021 – Lab 3 – *Sorting Hat*

Overview

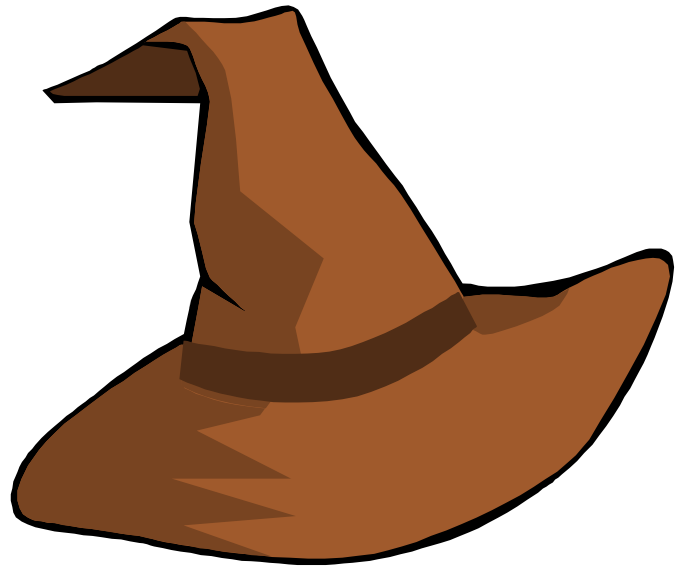
Student wizards and witches are taught at the famous **Hogwarts School of Witchcraft and Wizardry**. When students first arrive at this World-renowned school, they are sorted into one of the four different houses. This is accomplished with an ancient hat called the Sorting Hat.

*You might belong in Gryffindor,
Where dwell the brave at heart,
Their daring, nerve, and chivalry
Set Gryffindors apart;*

*Or yet in wise old Ravenclaw,
if you've a ready mind,
Where those of wit and learning,
Will always find their kind;*

*You might belong in Hufflepuff,
Where they are just and loyal,
Those patient Hufflepuffs are true
And unafraid of toil;*

*Or perhaps in Slytherin
You'll make your real friends,
Those cunning folks use any means
To achieve their ends.*



But, before the students get to enter The Great Hall and learn their fates, they have to wait in a rather-pleasant antechamber.

The room is full of a jittering crowd of stressed and excited students. Some students are pacing nervously; others have taken the opportunity to relax on one of the, many, soft couches that line the room.

However, in the corner, there is an eloquently crafted statue of a cat. A golden plaque on its pedestal reads "Ninji the Nonchalant". When students approach it, it calmly, soothingly, asks them a few questions. If Ninji thinks the student is too stressed, the pedestal dispenses a nice cup of soothing, calming, magical hot chocolate (cocoa). Hogwarts is amazing!

... and the student feels much better.



So, how does Ninji The Nonchalant determine that a student is too stressed? She asks a series of yes/no questions and, if the student gives the stressful answer, she adds a value to a running total.

When she is done asking questions, she looks at the sum. Then, Ninji either dispenses some delicious, calming, magical hot chocolate or, instead, a few kind words of encouragement.

Sample Run

The user's input is printed in **blue**. Questions that add points to the running total are marked with **red arrows**. The data outputted from your calculations is printed in **green**.

Note: that all the questions add up to 100.

Hello, student, I'm Ninji the Nonchalant.

Young student, did you buy your books? (1=yes 2=no)?

1

+25 points, not added

Did you get an animal pet? (1=yes 2=no)?

2

10 points

Are you afraid of what house you will be sorted into? (1=yes 2=no)?

1

Are you a muggle-born? (1=yes 2=no)?

2

15 points, not added

30 points

Oh, did you get a wand yet? (1=yes 2=no)?

1

+20 points, not added

Your total stress level is at 40

You are going to do fine student! Keep your chin up!

Here is a second student, who is a tad more stressed. In this example, the student over 70% is given some magical calming hot chocolate (cocoa).

Hello, student, I'm Ninji the Nonchalant.

Young student, did you buy your books? (1=yes 2=no)?
2

Did you get an animal pet? (1=yes 2=no)?
1

Are you afraid of what house you will be sorted into? (1=yes 2=no)?
1

Are you a muggle-born? (1=yes 2=no)?
2

Oh, did you get a wand yet? (1=yes 2=no)?
2

Your total stress level is at 75

Oh dear! You are so stressed! Here! Have some magical calming hot cocoa!

+25 points

+30 points

+20 points

Have Fun!

Don't have to use the Harry Potter theme. You can create your own stress program with your own questions, point values, and conditional messages.

The following are some, possible, categories.

- Stress of failing an exam.
- Stress of giving a presentation.
- Stress of getting into an auto accident.
- Stress of getting "pwn'd" in a video game.
- Stress of getting explosive diarrhea at a party.
- etc...

Tips

- Work in your program in parts
- The `rax` register is used by the library to input data and output results. Use direct storage store the values. In fact, you **must** use direct storage for credit.

Requirements

- You must think of a solution on your own.
- Any lab not using direct storage will receive a zero.

The requirements are as follows:

1. Prompt the user for each question.
2. Input the user's input for each question.
3. Use if statements to add points to a running total (depending on their answer).
4. At least 5 questions.
5. Use an If-Else at the end to display one of two messages.

Submitting Your Lab



This activity may only be submitted in Intel Format.

Using AT&T format will result in a zero. Any work from a prior semester will receive a zero.

To submit your lab, you must run Alpine by typing the following and, then, enter your username and password.

```
alpine
```

To submit your lab, send the assembly file (do not send the a.out or the object file) to:

```
dcook@csus.edu
```



Please set the subject field of your e-mail to be:

CSc 35 - #

...where # is your lecture section number. This will help me sort your work.

UNIX Commands

Editing

Action	Command	Notes
Edit File	<code>nano filename</code>	"Nano" is an easy to use text editor.
E-Mail	<code>alpine</code>	"Alpine" is text-based e-mail application. You will e-mail your assignments it.
Assemble File	<code>as -o object source</code>	Don't mix up the <i>object</i> and <i>source</i> fields. It will destroy your program!
Link File	<code>ld -o exe object(s)</code>	Link and create an executable file from one (or more) object files

Folder Navigation

Action	Command	Description
Change current folder	<code>cd foldername</code>	"Changes Directory"
Go to parent folder	<code>cd ..</code>	Think of it as the "back button".
Show current folder	<code>pwd</code>	Gives the current a file path
List files	<code>ls</code>	Lists the files in current directory.

File Organization

Action	Command	Description
Create folder	<code>mkdir foldername</code>	Folders are called directories in UNIX.
Copy file	<code>cp oldfile newfile</code>	Make a copy of an existing file
Move file	<code>mv filename foldername</code>	Moves a file to a destination folder
Rename file	<code>mv oldname newname</code>	Note: same command as "move".
Delete file	<code>rm filename</code>	Remove (delete) a file. There is no undo.