# user interface design

# qualifying exam

name:

## General Instructions

This exam is designed to test your abilities based on the User Interface Design course (C S 515). It is assumed that you are familiar with the texts from this course: Rogers, Preece, and Sharp's *Interaction Design*; selections from Norman's *The Design of Everyday Things: Revised and Expanded Edition*; selections from Tufte's *Envisioning Information*; and selections from Lazar, Feng, and Hochheiser's *Research Methods in Human-Computer Interaction*. You **may** consult Rogers, Preece, and Sharp's *Interaction Design* during the exam, however, the questions assume you are familiar with the other texts.
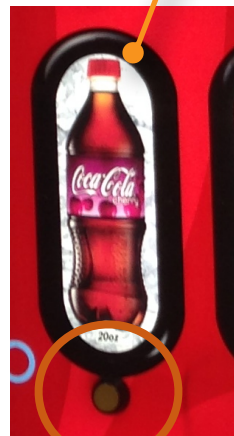
machine A                                        machine B
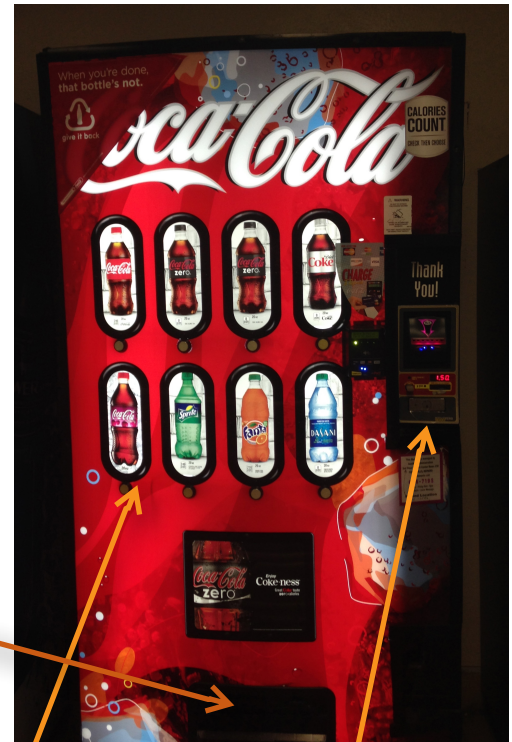
food
dispenses
here

letter and
number
keypad

button

## Disconnected? Interaction [40 points total]

On the opposite page are two designs for vending machines that one might commonly encounter (just down the hall, in fact). Each uses a different type of interaction, was developed under different constraints, and has its advantages and disadvantages. In essay form of one or two paragraphs (and possibly with diagrams), answer the questions / undertake the activities below. The purpose of this exercise is to demonstrate that you **understand how to critically analyze a design**, that you can **reason through the design process**, and that you **have a functional command of the design vocabulary**.

1.) Describe the interaction with each type of vending machine and the accompanying conceptual model; use your interaction design vocabulary. What procedures do you undertake to use it? What are the possible breakdowns? What feedback do you expect? How do you think the system works? [30 points]

2.) What were the likely restrictions on the design process (you should consider *designed constraints* separately, above) and the motivations for design decisions? Under what circumstances / for what tasks is each design better? Worse? [10 points]

## Developing a Research Project [60 points total]

You are an interaction design researcher / engineer and are embarking on a new project. You intend to build a smartphone scheduling app for students to support them in tracking due dates, class times, etc.

Describe a plan for gathering the necessary data to begin your project. Consider the **key questions you need answered** from potential users (hint: many demographic data are **not** key here), **what research methods you will use** (hint: simple surveys / interviews of interests and desires are insufficient), and **how you will acquire research subjects**. **Describe some of the functional and non-functional requirements** that you, without your data in hand, but perhaps with experience of such systems, expect. **What are some potential use cases?**

Hypothetically, your team will build multiple prototypes based on your answers above and the hypothetical data gathered from users. Based on having hypothetical prototypes, **describe a user study** that will determine the degree of success for your designs and suggest ways of changing them to make them better in the future.

You may assume that money is no object to your study, but must use existing technologies for gathering data and for your requirements and running user studies.

For this question, write at least one paragraph for each of the prompts below.

The rationale for this exercise is that you **demonstrate the ability to think through executing needs and requirements gathering and your ability to undertake HCI research**.

1.) What are the key questions you need answered from potential users of your system at a formative stage? [15 points]

2.) What research methods will you use to answer those questions? [10 points]

3.) What research subjects do you want for your study? How will you acquire them? [5 points]

4.) What are some of the functional and non-functional requirements you expect for this system (even though you do not yet have data)? [10 points]

5.) Describe at least one use case for your system. [5 points]

6.) Describe the activities that subjects of a user study with prototypes will undertake, the data you will collect, and how you will use the data to iterate the design. Carefully consider your hypothesis / hypotheses, conditions, and use of subjects. [15 points]