UNIVERSITY OF CALIFORNIA, MERCED

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SANTA BARBARA · SANTA CRUZ

CSE22: Introduction to Programming

Midterm Examination

Spring 2022

First Name: _____ **Last Name**: _____

UC Merced Email: _____

Instructions

- This is a closed book exam. No notes and/or electronic devices may be used.
- Write your name and UC Merced email in the space provided above.
- Answer every question in the space provided. If you run out of space, you can continue your answer on the back of the page, which has been purposefully left blank.
- Clearly indicate on the front page if your answer continues on the back, and number the question accurately on the back page.
- You have 1 hour 15 minutes to complete this exam.
- There is a total of 100 points in this exam.
- There are 8 pages, including this one.
- If you are unsure of anything, please ask.

1 General [5 points]

1.1. Describe an everyday task that people used to do manually, which has been transformed by computers. Name one advantage and one disadvantage of that. [5 points]

2 Linux Terminal Commands [15 points]

2.1. What is the command for navigating to the parent of the folder we are in? [3 points]

2.2. Write the terminal commands for performing the following sequence of tasks: [12 points]

- Navigate to the home directory
- In the home folder, create two folders, `left` and `right`
- Create a file called `one.txt` in the `left` folder
- Create a file called `two.txt` in the `right` folder
- In the `left` folder, rename the file `one.txt` to `file1.txt`
- Delete the entire `right` folder

3 Basic Python [15 points]

3.1. Assuming we are in some random folder *outside* our home directory and there is a file called `program.py` in a folder `~/apps`, what is the terminal command to run that Python program? [3 points]

3.2. Write a "hello world" program that asks for the user's name and age, and prints out a greeting message for them, in the form of `Hello, <name>. It's good to be <age>.` [6 points]

Bonus: Instead of the message above, display the following: `Hello, <name>. It's good to be in your <decade>s.`. Example, if the user entered their name as `Tony` and their age as `57`, then your greeting message should be: `Hello, Tony. It's good to be in your 50s.` No `if` statements may be used for this bonus part.

3.3. Write a program for splitting bills. It should ask the user to input the total amount due, and the number of people to split amongst. It should output a message of the form: `Each person owes <share>`, where `<share>` is the amount owed by each person. [6 points]

4 If Statements [15 points]

4.1. Write a program asks the user to input a score in the range $[0 \ldots 10]$. Scores under 3 are classified as `LOW`, scores from 3 to 7 are `MEDIUM`, and scores of 8 or above are `HIGH`. Your program should print the appropriate classification. If the user enters a number outside the given range, your program should print an error message: `Score out of range.` [7 points]

4.2. Write a Python program that asks the user to enter two points in 2D Cartesian space. Your program should determine whether the two points entered are in the same quadrant or not, and output either: `SAME QUADRANT` or `DIFFERENT QUADRANTS`. [8 points]

5 Loops [20 points]

5.1. Write a Python program that keeps asking the user to enter positive integers. The program should stop asking when the user enters -1, and it should print a message saying: `Thank you!` [5 points]

5.2. Write down all the output produced by the following program. Indicate the values of the `x` and `total` variables at every step of execution. [15 points]

```
x = 5
total = 1

while x >= 1:
    if x % 2 == 0:
        total = total * x
    else:
        total = total * x * 2

    print(x, total)
    x = x - 1

print ("Answer:", total)
```

6 Functions and Problem Solving [30 points]

6.1. Write a Python function named `calc` that takes in a dollar amount as a `float` and a `boolean` indicating whether the customer has a membership. If the customer has a membership, then they get a 15% discount on the amount, if they don't have a membership, then they get only 10% discount. Your function should return the appropriate amount. [10 points]

Example: `calc(100, False)` should return 90, because the customer has no membership and they get 10%. The call to `calc(100, True)` should return 85 because with a membership set to `True`, they get 15%.

6.2. In Lab 6 you were asked to create a math quiz game. Explain every aspect of your code in detail. How is the code structured? What design choices did you make and why? What problems did you encounter and how did you solve them? Points will be awarded for the level of detail you provide in your descriptions.

If you did not complete the lab, you can state that in your answer and then explain how you would go about implementing the game. Be as detailed as possible, iclude code snippets if necessary, but you can only do this if you have not turned in Lab 6 (we will check). If you have turned in Lab 6, you have to explain the code you submitted as stipulated above. [20 points]