SWEN 200 - Final Exam

December 11, 2023

Name _____

1) Git Merge + Testing (50 pts)

A project starts with two files: impl.js, and impl.test.js

impl.test.ts | impl.ts

impl.ts > TrainingEvent

```ts
export interface TrainingEvent {
  name: string
  description: string
  start: Date
  end: Date
}

let events: TrainingEvent[] = []

export function addEvent(event: TrainingEvent) {
  events.push(event)
}

export function deleteEvent(event: TrainingEvent) {
  events = events.filter((e) => e !== event)
}

export function find(text: string): TrainingEvent | undefined {
  return events.find((event) => event.name === text)
}

```

impl.test.ts

impl.test.ts > ...

```ts
import { TrainingEvent, addEvent, deleteEvent, find } from "./impl"

const mockEvents: TrainingEvent[] = [
  { name: "an Event", description: "b", start: new Date(), end: new Date() },
]

describe("mock TrainingEvents", () => {
  it("should be defined", () => {
    expect(mockEvents).toBeDefined()
  })

  it("should be able to add new events", () => {
    for (const m of mockEvents) {
      addEvent(m)
    }
    const e: TrainingEvent | undefined = find("an Event")
    if (e) {
      expect(e.name).toBe("an Event")
      expect(e.description).toBe("b")
    } else {
      fail("Event not found")
    }
  })
})
```

- One developer is asked to make the search work for substrings within the name. You can find their code in the "substring_name_search" branch of your repository.

- Another developer is asked to search by either the name or the description. You can find their code in the "description_search" branch of your repository.

- Your goal is to merge these branches so all the functions still "work" and also to modify the tests so these functionalities are still tested.

2) (25 pts) Ethics Case: Recall the 10 aspects of the code of ethics are: PUBLIC, CLIENT AND EMPLOYER, PRODUCT, JUDGMENT, MANAGEMENT, PROFESSION, COLLEAGUES, SELF

You are working on a quality control team testing software before release. Usually there is a "bug threshold" that determines whether the release should be delayed. If the number of bugs exceeds this threshold the release is delayed, otherwise it is not. You are on a tight timeline and the software in question is needed to satisfy a major contract. You find just enough bugs to trigger a delay, but your supervisor says that the release is too important and cannot be delayed. Of the code of ethics aspects above, which is the most important to consider in navigating this situation? Explain.

3) Design Alternatives (25 pts)

One of the features that doesn't exist in the current implementation of WebVPython is to allow users to search for public programs created by other users based on keywords or text found in the program. There are close to a million programs in the WebVPython database. One issue that arises in designing the search feature is that a particular search could generate many matches, possibly thousands or even hundreds of thousands!

1) In order to prevent the user from being overwhelmed one strategy is to download all the matches into memory, but to present them to the user in "batches" that can be controlled with user interface elements (e.g., buttons, links, scroll bars, etc.).
2) Another approach is to batch the events on the server and only keep a few batches in memory at any given time.

Describe the advantages and disadvantages of each approach. In addition to the user experience, and the general impact on the application's performance and stability, consider at least *one* of the following contexts: global, economic, environmental, or societal. If you are making assumptions WRT the application's user base size, business model, or computing resources, please state them explicitly.