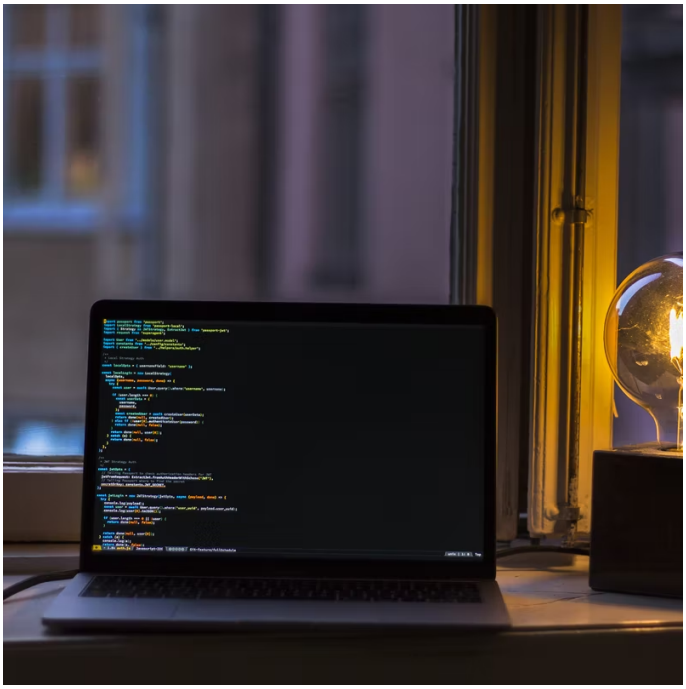

Programming Summative Assessment

Course: Information Technology

Title: Computer Programming

Grade: 12

Topic: Arrays, Files, and Searching

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“Be the one you love, do what you love.”

Rationale Guiding Questions

1. **What is the purpose of your assessment?**
   Analyze the knowledge and proficiency of the student in working with arrays, files, search functions (in specific programming language).
   Analyze students' ability to identify problems and come up with the most efficient ways to solve them.
2. **Identify the content (goals/outcomes) that are going to be assessed by this summative assessment.**
   A) Problem-solving techniques that students can use when working with arrays (for example they can use different type of arrays) or how to do the search or work with files.
   B) Student's ability to identify the most efficient method to solve problems
   C) What level of familiarity do students have with various array techniques and concepts?

3. **What factors did you consider when designing your assessment?**

- **Use a Rubric or Table of Specifications**
  The performance criteria for grades should be described in a rubric. At the beginning of the term, Rubrics describe an ideal assignment and outline expected performance.
- **Design Clear, Effective Questions**
  Students should be able to express their knowledge in a creative manner.
  It should be clear that any solution is acceptable and students are not limited to use an specific method or specific way of thinking.
- **Make Parameters Clear**
  A well-defined assessment process should include detailed parameters, such as the length of the assessment, depth of the response, time and date, and grading standards.

4. **Outline the procedures and responsibilities of both the students and the teacher.**

   A) **Teachers**

   - **Categorizing summative assessment questions**.
     Provide students with more focused study guidance by tagging exam items with learning objectives.
   - **Consider Blind Grading**
     Provide truly unbiased summative assessments.
     Questions should be design in a way that does not limit student's ways to find the answers.
     Also the teacher should be blind to the student identification that might cause decisions based on their previous assessments.

   - **Providing Feedback**
     Providing students with immediate feedback and detailed feedback. Feedback is essential for students to understand how far they have come in meeting the learning goals of the course.

   B) **Students**

   - **Feedback based study**
     They need to be prepared based on feedback from previous formative assessment, they should brain storm and ask for more detailed feedback during the course.
   - **Do not share the solutions in public groups**
     The sharing of questions and answers in a public forum is unethical, as it could bias the next person who sees a similar question and prevent them from creative contributing.

5. **Outline how your summative assessment will support student learning.**
   - **Motivates to study**
     For many students, periodic evaluation is the best motivation to study.
   - **Finds learning gaps**
     It will help students evaluate the weaknesses and strengths of your students.

Array, File and Search assessment

INSTRUCTIONS

- Students should not communicate or pair programs with other students.
- Students shall not share the answers before the end of the exam
- Students are free to use any IDE they prefer
- Students are allowed to leave the class if they finished the exam before the time ends.

PART 1

Definitions and concepts

1. Write down the definition of each of the following items
    a. Space complexity
    b. Time complexity

2. What is the difference between Map, Set, and List?

PART 2

Write an application that performs the following tasks
Note (file includes a list of customers' names, their orders, the date of the orders, and the price of each order)

Story: There is a coffee machine that stores customer’s name and orders with date and price for each order in a file.

1. Read in the row from the given input file and store them in alphabetical order.

2. Find all the data with customers' names starting with M/m.

3. Find out how many customers have ordered at least one item with a price of more than 2$

4. Find out how many customers have spent more than 10$ in the last month

5. Create a grouped array for each day that shows the customers' names and their orders

PART 3

1. Calculate the time and space complexity of the given code.

```
fun combinationSum3(k: Int, n: Int): List<List<Int>> {
    val result = mutableSetOf<List<Int>>()

    fun dfs(i: Int, current: List<Int>, sum: Int) {
        if (sum == n) {
            if (current.size == k){
                result.add(current)
            }
        }

        for (j in i..9) {
            if (sum + j > n) {
                break
            }

            dfs(j + 1, current + j, sum + j)
        }
    }

    dfs(1, emptyList(), 0)

    return result.toList()
}
```

2. Re-write the code with lower time complexity

3. Re-write the code with lower space complexity

References

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