

COMS W4115
Programming Languages and Translators

- Project Proposal -

skyEM

(**S**eungjin **K**yunghwan **Y**onghan **E**xam **M**aker)

Seungjin Nam

sn2119@columbia.edu

Kyung Hwan Kim

kk2367@columbia.edu

Yonghan Kim (Group Leader)

yk2081@columbia.edu

1. Introduction

Nowadays, the increasing popularity of Internet and online education systems, from mere tutorials to an extensive university classes, demand some ways to effectively create and manage their testing systems. For example, TOEFL (Test of English as a Foreign Language) is now exclusively offered online as an iBT (Internet-based test) and many other computer related certification exams are conducted on computers.

Many programming languages already exist now such as C, C++, and JAVA, and programmers could use those languages to create and manage test sessions. However, it would take a lot of time and efforts for programmers just to create a small test, and therefore wasting valuable resources otherwise they could have used to focus on other things. To provide quick and easy way to create and implement testing schemes, **skyEM** language has been developed.

2. Language Description and Features

skyEM is the language developed for the practical purpose of creating quizzes and tests. Moreover, many of its built-in commands and functions will enable programmers to create user-friendly environment for the test takers without extensive typing. Also a number of valuable data such as test score and test percentage can be manipulated.

1.1 Easy-To-Use

skyEM has only few set of keywords and their associated parameters. This allows test makers to focus on the quality of questions and furthermore increasing the quality of educational experience as a whole.

1.2 Pre-Defined Testing Format and Built-In-Functions

This will be the highlight of **skyEM** language. Pre-defined testing format allows users to supply just questions and answers and **skyEM** language will take care of the testing format. There will be a multiple-choice type questions, a matching type questions, and one-word-answer type questions.

Built-in-functions will let the users to load mp3 files and jpg files, and do other miscellaneous tasks.

1.3 Advanced Testing Administrative Functions

Users will be able to set time limit for the exam. Also test can be conducted in user-adaptive manner, meaning that the test difficulty will be automatically adjusted according to the performance of the test taker. This can be achieved by setting difficulty level to each question.

1.4 Portable

skyEM code will be compiled into Java byte code, which makes it architecturally neutral. It can be developed on any platform that has Java compiler, JVM and GUI. The code itself is also written in a plain text file, which enables it to be transferred to any other machine.

3. Example of Code

```
// Creates a subject object named 'biology ' which contains a group of questions
// Parameter '50' sets the time limit of 50 minutes for the questions to be
answered
// Parameter 'rand' makes the questions to appear in random order.
// Parameter 'all' makes all questions to appear during the examination
subject biology(50, rand, all)
{
    print "Biology Examination ( 50 Minutes )";
    // Creates a multiple-choice type question worth 3 points
    question multiple(3)
    {
        load picture "mitochondrion.jpg"; // Loads a picture
        // ask function displays the question with a appropriate numbering
        scheme
        ask "Name the organism inside the cell in the picture above";
        // answer function defines the answer
        answer "mitochondria";
        // choices function displays wrong answer choices randomly
        choices ["nucleus", "lysosome", "golgi", "ribosomes"];
    }
}
```

```
// Creates a matching type question worth 5 points
question matching(5)
{
    answer ["mammal", "insect", "reptile"];
    choices ["elephant", "bee", "turtle"];
}
}
```

```
// Various useful pre-defined functions of subject object
print "Your possible total point is " + biology.total();
print "You scored " + biology.score();
print "Your score percentage is " + biology.percentage();
```