BITS Pilani, Hyderabad Campus
Department of Computer Science and Information Systems
Second Semester, 2024-25
CS F363 Compiler Construction
Project part 2 (12 Marks)

The description of the toy language is the same as given in Part 1.

1 Tasks

1. **[5 marks]** Write a Bison program to check if the given program is syntactically correct for the toy language.

2. **[7 marks]** Extend your Bison program to print an abstract syntax tree (AST) for the given input program if it is syntactically correct. Print your AST as a generalized list (see Lab sheet 9 for more details).

2 Input and output format

The input program will be given in a text file, whose name will be given at the runtime. Use the following code for the same purpose.

```c
int main(int argc, char *argv[]) {
    if (argc != 2) {
        fprintf(stderr, "Usage: %s <input file>\n", argv[0]);
        return 1;
    }

    yyin = fopen(argv[1], "r");
    if (!yyin) {
        perror("Error opening file");
        return 1;
    }

    yyparse();
    fclose(yyin);
    return 0;
}
```

The output should be displayed on the screen.

3 Submission guidelines

1. You work on the assignment with your group members and are strongly discouraged from discussing it with others.

2. You can refer to the Internet/Web resources only to understand the syntax of the Bison/Flex tools.

3. Taking code from the Internet/Web is strictly prohibited. If you do, it will lead to severe penalties.

4. Create a zip file with the following folders/files in it.

   (a) Create separate folders for Syntax Analysis and AST. Keep the respective files and all necessary files in the folders.

   (b) Create a `make` file to compile bison and flex codes and to generate an executable file (let it generate a default file `a.out`). Keep the `make` file in both folders: Syntax Analysis and AST.

   (c) A PDF file that contains the information of the group members (BITS ID, name, and email ID).

5. Due date is 15 April 2025 at 11:59 PM. Late submissions will be allowed up to 24 hours after the deadline with a penalty of `2%` per hour.