Department of CSE, BUET, Level-3, Term-1
Course: CSE 309 (Compiler), Term: January 2021
Class Test: 3, Time: 25 minutes, Marks: 20, Date: June 22, 2021

Instructions:

a. On the top of your answer script, write your name and student no.

b. If you use multiple pages, put page number on the top of each page

c. After your exam is finished, scan all the pages in order and convert it to a single pdf.

d. Name the pdf file created in the step (c) with your student no and upload in Moodle through the given submission link.

1. The following grammar generates a list of numbers of the form- {num_1, num_2, …., num_n} where the terminal ***num*** represents any constant integer number. **(8)**

   $L \rightarrow$ *'{' N '}'*

   $N \rightarrow$ *N ',' **num** | **num***

   Now, design an SDD that will compute and print –

   For students whose student numbers are ODD

   (i) Index of the minimum number.

   (ii) The count of numbers whose values are less than their indices.

   Assume the leftmost number has the index **1**.

   For example, for the input {*3, 6, 1, 2, 5*}, (i) the index of the minimum number is ***3***, and (ii) the count of numbers whose values are less than their indices is ***2***.

   For students whose student numbers are EVEN

   (i) Index of the maximum number.

   (ii) The count of numbers whose values are greater than their indices

   Assume the leftmost number has the index **0**.

   For example, for the input {*3, 6, 1, 2, 5*}, (i) the index of the maximum number is ***1,*** and (ii) the count of numbers whose values are greater than their indices is ***3***.

2. Refer to Question 1 above. For the SDD you have defined, give the annotated parse tree for the list of numbers {3, 6, 1, 2, 5}**.** Also show the dependency graph for the annotated parse tree drawn. **(4+3)**

3. Refer to Question 1 above. Convert the SDD to an SDT that can be implemented during parsing. **(5)**