ICS-365 HW2

\* Due Date – See Class Schedule \*

1. Define *lexeme* and *token* (use your own words do not cut and paste)

Should be in student’s own words, but include these concepts:

1 - Lexeme: is a syntactic unit containing a sequence of characters in the source program.

2 - Token: is category identifier of lexemes.

For example, the lexemes and tokens in the following expression can be:

Ex: var2 = 4 + 3 – var1

Lexemes tokens

var2 identifier

= equal-sign

4 int\_literal

+ math\_op

3 int\_literal

- math\_op

var1 identifier

1. How are programming languages formally defined.

By recognition and generation.

They are defined using context-free grammar. The most widely spread used technique is the BNF,

developed by Backus and revised by Naur. Context-free grammar works by having expressions

expand into their most basic lowest units.

1. Write EBNF descriptions for the following:
2. A Java class definition header statement

<class\_head> → {<modifier>} **class** <id> [**extends** class\_name]

[**implements** <interface\_name> {, <interface\_name>}]

<modifier> → **public** | **abstract | static | final**

1. A C **switch** statement

<switch\_stmt> → **switch** ( <expr> ) {**case** <literal> : <stmt\_list>

{**case** <literal> : <stmt\_list> } [**default** : <stmt\_list>] }

1. Given a context-free grammar, a recognizer for the language generated by the grammar can be algorithmically constructed? (True or False)
2. Program to calculate what year someone will turn a specific age. Must use a function, and a “#defined” variable set to a target age. Say the target age is 70, your program will ask the user what their birth year is then calculate (using a function) and output the year they will be 70. Change the target age to 94, and compile and run the program again. Turn in code for and screen shots for both runs of the program.

Main function will handle all the input and output, the function (you define, not the main) will do the calculation accepting input of the birth year and returning the target year.

/\* Program to calculate what year someone will turn a specific age \*/

#include <stdio.h>

#define TARGET\_AGE 70

int year1, year2;

int calcYear(int year1);

int main(void)

{

// Ask the user for the birth year

printf("What year was the subject born? ");

scanf(" %d", &year1);

// Calculate the future year and display it

year2 = calcYear(year1);

printf("Someone born in %d will be %d in %d.",

year1, TARGET\_AGE, year2);

return 0;

}

/\* The function to get the future year \*/

int calcYear(int year1)

{

return(year1+TARGET\_AGE);

}