

Solution Assignment 1

1. Tokenize the follow Python code, make a table of tokens and lexemes along with token count (Refer Lexical Analysis slides for reference) (10 marks)

```
def calculate_square(num):
```

```
    result = num ** 2
```

```
    return result
```

```
print(calculate_square(5))
```

The following tokens could be Keyword (includes functions), Identifier, Operator, Constant, Separator (Punctuation & Parentheses).

Answer:

Lexemes	Tokens
def	Keyword
calculate_square	Identifier
(Separator
num	Identifier
)	Separator
:	Separator
result	Identifier
=	Operator
num	Identifier
**	Operator
2	Literal / Constants
return	Keyword
result	Identifier
print	Keyword
(Separator
calculate_square	Identifier
(Separator
5	Literal / Constants
)	Separator

)	Separator
---	-----------

Token Count: 20

- What is the lexeme associated with the token num in the Python code snippet provided in question 1? (1 mark)

Answer: "num" lexeme has the token type "Identifier"

- Identify and list any potential lexical errors in the following Python code: (1 mark)

```
if x > 10
    print("x is greater than 10")
```

Answer: colon(:) is missing after if x > 10.

- Tokenize the following C code, make a table of tokens and lexemes along with token count (10 marks)

```
#include <stdio.h>

int main() {
    printf("Hello, World!\n");
    return 0;
}
```

Answer:

Tokens	Lexemes
#include	Keyword
<stdio.h>	Identifier
int	Keyword
main	Identifier
(Separator
)	Separator
{	Separator
printf	Keyword

(Separator
"Hello, World!\n"	Literal / Constants
)	Separator
;	Separator
return	Keyword
0	Literal / Constants
;	Separator
}	Separator

Token Count: 16

5. Identify the lexeme associated with the token 'return' in the C code provided in question 4. (1 mark)

Answer: "Keyword" is the token associated with lexeme "return"

6. What is a potential lexical error in the following C code? (1 mark)

```
float price = 9.99.
```

Answer: Semicolon (;) is missing at the end of statement.

7. Consider the following C code snippet:

```
int main() {
    int variable123 = 42;
    float pi_value = 3.14;
    return 0;
}
```

Identify and list the lexemes associated with the identifiers in the code. (6 marks)

Answer: Lexemes that are associated with the identifiers token are:

1. main
2. variable123
3. pi_value