Beijing National Day School
Department of Mathematics & Computer Science

AP Computer Science Principles

Test 1: `Python Syntax` and `Strings`

Exam Record	
Part1	/ 23 pts
Part2	/ 15 pts
Part3	/ 12 pts
Total:	/ 50 pts
Grade:	

English Name: _____

Pinyin Name: _____

Mr. Alwin Tareen, Fall 2019

AP Computer Science Principles Test 1: `Python Syntax` and `Strings` Mr. Alwin Tareen
Fall 2019 BNDS

Part I: Multiple Choice (23 points)

- Determine the answer to each of the following questions, using the available space for any necessary scratchwork.
- Decide which is the best of the choices given, and select the correct answer by placing an "**X**" in the corresponding box.

(1pt) **1.** Which of the following choices is a legal and legitimate `Python` variable name?

- ☐ `2bad4you`
- ☐ `calvin&hobbes`
- ☐ `year2000`
- ☐ `#hammertime`

1 pt

(1pt) **2.** You would like to set up a variable called `ounces` that has the value `16`. What simple `Python` statement will accomplish this?

- ☐ `ounces = 16`
- ☐ `16 = ounces`
- ☐ `def ounces(16):`
- ☐ `ounces(16)`

1 pt

(1pt) **3.** What does the following `Python` statement print out:
`print("123" + "abc")`

- ☐ `"123" + "abc"`
- ☐ This is a syntax error because you cannot add strings.
- ☐ `123+abc`
- ☐ `123abc`

1 pt

(1pt) **4.** In `Python`, the `float` data type is used to store:

- ☐ booleans
- ☐ decimal numbers
- ☐ strings
- ☐ integers

1 pt

(1pt) **5.** What is the result of the following `Python` statement:
`print(42%10)`

- ☐ `1042`
- ☐ `420`
- ☐ `4`
- ☐ `2`

1 pt

5 pts

(1pt) **6.** Which of the following choices is the correct assignment statement for a `string` data type?

- ☐ `greetings = [Hello]`
- ☐ `greetings = @Hello@`
- ☐ `greetings = "Hello"`
- ☐ `greetings = #Hello#`

1 pt

(1pt) **7.** What is the result of the following `Python` statement:
`print(17/4)`

- ☐ `4`
- ☐ `4.0`
- ☐ `4.3`
- ☐ `4.25`

1 pt

(1pt) **8.** What are the only values that are permissible in `Python`'s `boolean` data type?

- ☐ `Yes, No`
- ☐ `On, Off`
- ☐ `Right, Wrong`
- ☐ `True, False`

1 pt

(1pt) **9.** Which of the following is a comment in `Python`?

- ☐ `/* This is a test */`
- ☐ `// This is a test`
- ☐ `# This is a test`
- ☐ `% This is a test`

1 pt

(1pt) **10.** Which of the following elements of a mathematical expression in `Python` is evaluated first?

- ☐ Multiplication `*`
- ☐ Addition `+`
- ☐ Parenthesis `()`
- ☐ Subtraction `-`

1 pt

(1pt) **11.** What will be the value of `x` when the following statement is executed: `x = int(98.6)`

- ☐ `99`
- ☐ `6`
- ☐ `98`
- ☐ `100`

1 pt

(1pt) **12.** What does the `Python` function `input()` do?

- ☐ Pause the program and read data from the user.
- ☐ Take a screen shot from an area of the screen.
- ☐ Read the memory of the running program.
- ☐ Connect to the network and retrieve a web page.

1 pt

7 pts

(1pt) **13.** Which `Python` keyword indicates the start of a function definition?

- ☐ `sweet`
- ☐ `def`
- ☐ `continue`
- ☐ `return`

1 pt

(1pt) **14.** Consider the following function definition:

```
def circlearea(radius):
```

In this context, what is the formal name for the variable `radius`?

- ☐ expression
- ☐ logical deduction
- ☐ parameter
- ☐ condition

1 pt

(1pt) **15.** Which of the following is NOT a valid string method in `Python`?

- ☐ `boldface()`
- ☐ `startswith()`
- ☐ `upper()`
- ☐ `strip()`

1 pt

(1pt) **16.** What does the following Python program print out?

```
str1 = "Hello"
str2 = "there"
greet = str1 + str2
print(greet)
```

- ☐ `Hello there`
- ☐ `Hellothere`
- ☐ `there`
- ☐ `Hello`

1 pt

(1pt) **17.** How would you use the index operator to print out the letter `"q"` from the following string?

```
x = "From marquard@uct.ac.za"
```

- ☐ `print(x[9])`
- ☐ `print(x[8])`
- ☐ `print(x[-1])`
- ☐ `print(x[q])`

1 pt

(1pt) **18.** How would you use string slicing to print out `"uct"` from the following string?

```
x = "From marquard@uct.ac.za"
```

- ☐ `print(x[14+17])`
- ☐ `print(x[15:18])`
- ☐ `print(x[14:17])`
- ☐ `print(x[14:3])`

1 pt

6 pts

(1pt) **19.** What is the iteration variable in the following `Python` code?

```
for letter in "banana":
    print(letter)
```

- ☐ `letter`
- ☐ `print`
- ☐ `in`
- ☐ `"banana"`

1 pt

(1pt) **20.** How would you print out the following string in all upper case in `Python`?

```
greet = "Hello there"
```

- ☐ `puts greet.ucase;`
- ☐ `print(uc($greet))`
- ☐ `print(greet.upper())`
- ☐ `console.log(greet.toUpperCase());`

1 pt

(1pt) **21.** What does the following Python program print out?

```
data = "From stephen.marquard@uct.ac.za"
pos = data.find(".")
print(data[pos:pos+3])
```

- ☐ `uct`
- ☐ `mar`
- ☐ `.ma`
- ☐ `ste`

1 pt

(1pt) **22.** Consider the following string declaration:

```
grocery = "Mango"
```

Which of the following statements would cause an error(also known as a traceback)?

- ☐ `dance = "T" + grocery[1:]`
- ☐ `person = grocery[:-2]`
- ☐ `several = grocery * 3`
- ☐ `grocery[0] = "T"`

1 pt

(1pt) **23.** Consider the following Python code:

```
lunch = "pizza"
dinner = lunch[:]
```

Note that the `start` and `stop` indexes are omitted from the square bracket notation. What is the technical term for the outcome of this kind of string slicing?

- ☐ concatenation
- ☐ immutable
- ☐ clone
- ☐ iteration

1 pt

5 pts

Part II: Short Answer (15 points)

- Solve each of the following short answer questions. Write your solution in the corresponding box labelled, "Answer:".

(1pt) **1.** What is the output of the following `Python` code:

```
print(3 > 4 or (2 < 3 and 9 > 10))
```

Answer:

1 pt

(1pt) **2.** What is the output of the following `Python` code:

```
lunch = "cheeseburgers"
print(lunch[6:12])
```

Answer:

1 pt

(1pt) **3.** What is the output of the following `Python` code:

```
breakfast = "pineapple"
print(breakfast[:4])
```

Answer:

1 pt

(1pt) **4.** What is the output of the following `Python` code:

```
flavor = "strawberry"
print(flavor[5:])
```

Answer:

1 pt

(1pt) **5.** What is the output of the following `Python` code:

```
icecream = "vanilla"
print(icecream[:])
```

Answer:

1 pt

(1pt) **6.** What is the output of the following `Python` code:

```
drink = "soda"
print(drink[:-1])
```

Answer:

1 pt

(1pt) **7.** What is the output of the following `Python` code:

```
beverage = "water"
print(beverage * 3)
```

Answer:

1 pt

(1pt) **8.** What is the output of the following `Python` code:

```
greetings = "Hello, world!"
newgreetings = "J" + greetings[1:]
print(newgreetings)
```

Answer:

1 pt

8 pts

(1pt) **9.** What is the output of the following `Python` code:

```
print("cola" in "chocolate")
```

Answer:

1 pt

(1pt) **10.** What is the output of the following `Python` code:

```
fruit = "kiwi"
bigfruit = fruit.upper()
print(bigfruit)
```

Answer:

1 pt

(1pt) **11.** What is the output of the following `Python` code:

```
citrus = "ORANGE"
smallcitrus = citrus.lower()
print(smallcitrus)
```

Answer:

1 pt

(1pt) **12.** What is the output of the following `Python` code:

```
vegetable = "cauliflower"
index = vegetable.find("u")
print(index)
```

Answer:

1 pt

(1pt) **13.** What is the output of the following `Python` code:

```
line = "Please have a nice day"
print(line.startswith("Please"))
```

Answer:

1 pt

(1pt) **14.** What is the output of the following `Python` code:

```
meal = "fresh pizza is the best pizza"
print(meal.replace("pizza", "salad"))
```

Answer:

1 pt

(1pt) **15.** What is the output of the following `Python` code:

```
def choose(x, y, z):
    if x:
        return y
    else:
        return z
print(choose(False, 2, 3))
```

Answer:

1 pt

7 pts

Part III: Python Programming (12 points)

- Show all of your work. Remember that program segments are to be written in the `Python` programming language.

(2pts) **1. Specification**

Write a `Python` function called `endother` that takes in two strings as parameters, `a` and `b`. It returns `True` if either of the strings appears at the very end of the other string, and `False` otherwise.

2 pts

Hints

- The string method `word.lower()` returns the lowercase version of a string.
- The string method `first.endswith(second)` returns `True` if string `first` ends with string `second`, and `False` otherwise.

If the following statements are executed:

```
result = endother("AbC", "HiaBc")
print(result)
```

Then the output of your program should be: `True`

```
def endother(a, b):
    # YOUR CODE HERE
```

2 pts

(2pts) **2. Specification**

2 pts

Write a `Python` function called `catdog` that takes in a string `word` as a parameter. The function returns `True` if the string `"cat"` and `"dog"` appear the same number of times in `word`, and `False` otherwise.

Hints

- The string method `word.count(item)` counts the number of occurrences of `item` in the string `word`.

If the following statements are executed:

```
result = catdog("catxdogxdogxcat")
print(result)
```

Then the output of your program should be: `True`

```
def catdog(word):
    # YOUR CODE HERE
```

2 pts

(2pts) **3. Specification**

2 pts

Write a `Python` function called `combostring` that takes in two strings as parameters, `a` and `b`. It returns a new string of the form `short+long+short`, with the shorter string on the outside, and the longer string on the inside. The strings will not be the same length, but they may be empty.

The function `combostring` should return a `string`.

If the following statements are executed:

```
result = combostring("Hello", "hi")
print(result)
```

Then the output of your program should be: `hiHellohi`

```
def combostring(a, b):
    # YOUR CODE HERE
```

2 pts

(3pts) **4. Background Theory**

3 pts

In this question, you will write a `Python` function that performs the multiplication operation, but with a technique that the Ancient Egyptians used. The algorithm for Ancient Egyptian Multiplication can be expressed as follows. Assume that `grow` and `shrink` are the numbers to be multiplied together:

- Create an integer variable called `product` to hold the solution.
- Check to see if `shrink` is an odd number.
- If `shrink` is odd, then add the number `grow` to the variable `product`.
- Multiply the number `grow` by `2`.
- Divide the number `shrink` by `2`(*Note*: Use integer division).
- Continue until the number `shrink` becomes zero.
- Return the variable `product`.

Specification

Write a `Python` function that takes in two integer values, `grow` and `shrink`, as parameters, and calculates their multiplicative product using the Ancient Egyptian Multiplication algorithm.

The function should return an `integer`.

If the following statements are executed:

```
result = multiply(23, 58)
print(result)
```

Then the output of your program should be: `1334`

Write your solution on the next page.

3 pts

```
def multiply(grow, shrink):
    # YOUR CODE HERE
```

0 pts

(3pts) **5. Background Theory**

3 pts

Pig Latin is a type of slang language that is easy to learn and understand. An English word can be translated into Pig Latin by following these two simple rules:

- If the English word begins with a vowel, then the corresponding Pig Latin word is generated by appending the letters `"hay"` to the end of the word. For example, `"orange"` becomes `"orangehay"`.
- If the English word begins with a consonant, then the corresponding Pig Latin word is generated by moving the first letter to the end of the word, then appending the letters `"ay"`. For example, `"peach"` becomes `"eachpay"`.

Specification

Write a `Python` function that takes in an English word as a parameter, and translates that word to Pig Latin.

The function should return a `string` which is the Pig Latin translation of the parameter `word`.

If the following statements are executed:

```
result = piglatin("orange")
print(result)
```

Then the output of your program should be: `orangehay`

If the following statements are executed:

```
result = piglatin("peach")
print(result)
```

Then the output of your program should be: `eachpay`

Write your solution on the next page.

3 pts

```
def piglatin(word):
    # YOUR CODE HERE
```

0 pts