Beijing National Day School
Department of Mathematics

AP Computer Science Principles

Test 1: `Python Syntax` and `Strings`

Exam Record

Part1 ______________/ 23 pts

Part2 ______________/ 16 pts

Part3 ______________/ 12 pts

Total: ______________/ 51 pts

Grade: ______________

English Name: ________________

Pinyin Name: ________________

Mr. Alwin Tareen, Fall 2018

AP Computer Science Principles
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Test 1: `Python Syntax` and `Strings`

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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 (16 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: F

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:

```
print("seed" in "banana")
```

Answer:

1 pt

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

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

Answer:

1 pt

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

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

Answer:

1 pt

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

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

Answer:

1 pt

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

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

Answer:

1 pt

(1pt) **15.** 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) **16.** 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

8 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.** Assume that sample is a string of lower case text characters. Write a Python function that counts the number of vowels that are contained in the string sample. Valid vowels are: "a", "e", "i", "o", "u". Your function should be called:
def countvowels(sample):
The function should return an integer which is the total quantity of vowels in the string.

2 pts

- If the following statements are executed:

```
result = countvowels("azcbobobegghakl")
print(result)
```

Then the output of your program should be: 5

```
def countvowels(sample):
    // YOUR CODE HERE
```

2 pts

(2pts) **2.** Write a Python function that takes in a string as a parameter, and generates a new string, which is made up of three copies of the last two characters of the original string. Your function should be called:

2 pts

`def extraend(word):`

The function should return a string.

- If the following statements are executed:

```
result = extraend("hello")
print(result)
```

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

```
def extraend(word):
    // YOUR CODE HERE
```

2 pts

(4pts) **3.** 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:

4 pts

- 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.

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. Your function should be called:

```
def multiply(grow, shrink):
```

Note: This function returns an integer value.

- 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.

4 pts

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

0 pts

(4pts) **4.** 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:

4 pts

- 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"`.

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

```
def piglatin(word):
```

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

4 pts

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

0 pts

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0 pts