ECS401: Unit 1 Lab Progress Test
FEEDBACK: Answers and Explanations

You may have got some of the answers wrong, but if so don't worry. You are capable of sorting it out but you need to put some effort in now. It just takes a bit of work on your part and some help if needed. Once you have understood the concepts properly you just then need a bit of care thinking things through when you are answering questions.

If you take it seriously, this sheet will help improve your understanding and the lab tutors can give you more help if you need it.

1. **CORRECT ANSWER:**

```
Wakanda Forever!
```

System.out.println is a print statement so whatever is in the quotes between the brackets appears on the screen (and the cursor moves on to the next line). You should have therefore included the exclamation mark. You should not have written quotation marks in your answer. They are not part of what is sent to the screen – they are just start and end markers in the Java language for strings.

2. **CORRECT ANSWER:**

```
Did he freeze?
Like an antelope in headlights.
```

This fragment has two print statements one after another. Instructions are executed in the order they appear down the page. First

```
Did he freeze?
```

is printed by the first instruction. Then once that is done (with the cursor now on the next line)

```
Like an antelope in headlights.
```

is printed by the second print statement. System.out.println always goes on to a new line when it is finished. That means each piece of text is printed on a new line

3. **CORRECT ANSWER:**

```
T'Challa
```

In this case the thing that is between the brackets is not an actual String value (no quotes) but a variable called `king`. It is a place where a String value is found. The line before stored the value `T'Challa` into the variable `king` so it is actually `T'Challa` that is printed to the screen.

If you said that `king` would be printed to the screen you may be confusing the name of a variable (here `king`) with the value in it. Think of the variable as a box that you call `king` so you know which box you mean with the word `T'Challa` stored in it. The instruction tells the computer to print on the screen whatever is in the box.

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4. **CORRECT ANSWER:**

```
T'ChakaT'Chaka
```

This time the program has to do some work before knowing what to print. It has to evaluate the expression in the brackets. It says to take whatever is in variable `king` and stick it end to end (concatenate it) with another copy of what it found there. The word `T'Chaka` is in the variable, so `T'Chaka` is stuck together with itself to give `T'ChakaT'Chaka`.

If you put a space between the two `T'Chaka's` then you got it wrong. There is nothing in the instruction to say include a space. If the program doesn't say to do it, then it doesn't get done!

5. **CORRECT ANSWER:**

```
T'Chaka is king
T'Challa is king
```

Here we store in the variable `king` the word `T'Chaka` and print it out so `T'Chaka` appears on the screen followed by `is king`. The println command says then go to a new line so the next thing is printed on the next line. We now put a new value into the variable `king` so the old contents are lost: variables are boxes that can only hold one thing at a time. Now when we print, `T'Challa` is there so that is what is printed out on the next line.

6. **CORRECT ANSWER:**

```
Who played the Black Panther?
Chadwick Boseman
You think Chadwick Boseman is a superhero?
```

Whatever the person enters is placed in the variable actor, so this time (as we are told that is what the user types in) the value `Chadwick Boseman` is stored. Before printing we glue together three strings: `"You think ", "Chadwick Boseman"` as that was what was in `actor` and `" is a superhero?"` in that order giving the full glued together string value

```
You think Chadwick Boseman is a superhero?
```

that is printed.

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7. **CORRECT ANSWER:**

`Nakia + Natasha`

This time a new string is created before we get to the instruction doing the printing. The variable called `thebest` is made to hold a variable that combines the string "`Nakia`" with a string consisting of a space character a + character and another space followed by the string "`Natasha`". Finally that newly constructed string is given to `System.out.println` to print out.

The thing to look carefully at is the part `spy1 + " + " + spy2;`
The + symbol is being used in two different ways. The first and last +'s are operators. They are essentially commands to stick together the strings given on either side. The + in the middle is different. It is in between two quote symbols. That makes it a character inside a string. It is just part of a value to be stored somewhere, not an instruction to the computer to do something with a value like the other +s.

8. **CORRECT ANSWER:**

```
String genius1 = "Stark";
String genius2 = "Shuri";
System.out.println(genius2 + " is smarter than " + genius1);
```

Things to watch! ... Did you use the variables the right way round with genius2 first? Did you put space before and after the phrase *is smarter than* ? Did you remember all the semicolons?

9. **Values** in a program are pieces of data that can be manipulated.

```
String hi = "Hi, there";
String bye = "Goodbye";
System.out.println(hi + " so long " + " " + bye);
```

10. A **variable** is a named place that a program can store values.

```
Scanner scanner = new Scanner(System.in);
System.out.println("Answer?");
String userfact = scanner.nextLine();
System.out.println("You said" + userfact);
return;
```

11. A **variable declaration** is a statement that creates a variable. It is the point where the variable is first introduced – it is given a name and the type of data it holds is set (though a value being stored is not part of the declaration specifically).

```
String bye;
String hi = "Hi, there";
bye = "Goodbye";
System.out.println(hi + " so long " + " " + bye);
```

12. **Explain** in your own words what is meant by a variable illustrating your answer by giving your own illustrative example.

An explain question requires just that – an explanation – aim to teach a novice what the term or concept means with your answer. It is not just a one-line answer that is expected (unless on an exam there is only 1 mark for it perhaps). For 3 marks you would expect at least a paragraph and probably an explained illustrative example.

The following is a good answer though obviously there are many different ways to answer this question. Yours should be different as it should be in your own words with your own examples.

Answer

A variable is a storage space for storing data that is given a name in a program. When the data stored there is needed, it can be accessed in that part of the program by referring to the variable's name. Variables have to be declared in Java before use. This is done with an instruction like

```
String address;
```

This declares a new variable called `address` and says it is to be used to store string data (sequences of characters).

We can store a value in a variable using assignment eg

```
address = "221B Baker Street";
```

stores the string `"221B Baker Street"` into variable address where it can be later retrieved. For example

```
System.out.println(address);
```

would now print out

```
221B Baker Street
```

Note when we access a variable we do not remove what is there – essentially we look in the variable and take a copy of the data found there to then do something with (like print it as above).

A variable can only hold one piece of data at once in the sense that if we put a new value in then the old value that was there is destroyed. The following changes the address stored to `"1 London Bridge"`

```
address = "1 London Bridge";
```

The program no longer can access the original value of `"10 Downing Street"` – it has been overwritten.

```
System.out.println(address);
```

now prints out `"1 London Bridge"`