





Unit 1 – ICS4U0 – Java Applets & Strings

Sample Test – February 12, 2025

Name: Gorski

Total	Knowledge 	Communication 	Thinking 	Application 
(100)	(24)	(21)	(21)	(34)

Knowledge

1. This is the original String:
String r = "Roronoa Zoro";

0	1	2	3	4	5	6	7	8	9	10	11
R	O	R	O	N	O	A		Z	O	R	O

/10

Match the code with the output.

i	8	a. System.out.println (r.length ());
a	12	b. System.out.println (r.charAt (0));
c	97	c. System.out.println ((int) r.charAt (6));
m	true	d. System.out.println (r.charAt (r.length () - 1));
n	false	e. System.out.println (r.charAt (4) + "" + r.charAt (0));
j	a Zo	f. System.out.println (r.toUpperCase ());
e	nR	g. System.out.println (r.toLowerCase ());
d	o	h. System.out.println (r.replace ('o', 'y'));
l	on	i. System.out.println (r.indexOf ('Z'));
b	R	j. System.out.println (r.substring (r.length () / 2, 10));
k	Ro	k. System.out.println (r.substring (0, 2));
f	RORONOA ZORO	l. System.out.println (r.substring (3, 5) + r.substring (7, 8));
h	Ryrynya Zyry	m. System.out.println (r.compareTo ("Blackbeard") > 0);
g	roronoa zoro	n. System.out.println (r.equals ("Nami"));

returns a space so it doesn't show

2. Use this code to fill in the memory diagram. Then, write out what each substring prints.

String x = "Straw Hat Pirates";

/5

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
S	t	r	a	w		H	a	t		P	i	r	a	t	e	s



(a)	System.out.println (x.substring (0, 5));	Straw
(b)	System.out.println (x.substring (10, (x.length () ¹⁷)));	Pirates
(c)	System.out.println (³ x.substring (x.indexOf ('a'), ⁸ x.length () / 2));	aw Ha

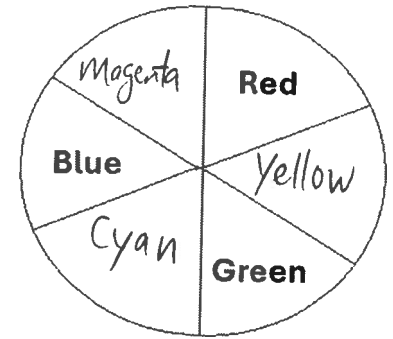
first a 17/2 = 8 chop off decimal

3. Write the code required for each colour. /6

```

red      title.setBackground(new Color(255, 0, 0));
green    title.setBackground(new Color(0, 255, 0));
blue     title.setBackground(new Color(0, 0, 255));
yellow   title.setBackground(new Color(255, 255, 0));
cyan     title.setBackground(new Color(0, 255, 255));
magenta  title.setBackground(new Color(255, 0, 255));
white    title.setBackground(new Color(255, 255, 255));
black    title.setBackground(new Color(0, 0, 0));
    
```

4. Fill in this colour wheel based on the computer colours. Use the proper colour names. /3



Communication

5. Fill in the words that match the descriptions given. /10

String	(a) A type of variable that holds a group of chars.
charAt	(b) A String method that returns a char.
Brute Force	(c) An attack that can break a Caesar shift.
ASCII	(d) An encoding technique for translating letters to binary.
Pig Latin	(e) Encryption named for an animal and the Ancient Roman language.
Mirror Writing	(f) Encryption that can be decrypted with a shiny reflective surface.
Cipher text	(g) A general term for text that is not easily read.
Black Box	(h) A type of testing where you don't look at the code.
indexOf	(i) The opposite String function to charAt.
JButton	(j) A type of widget used for mouse input.

6. Why is testing important? Provide a specific example. (3 points, at least 3 sentences) /3

- ① Testing is important because it prevents costly errors.
- ② For example, in 1996 the ESA agency launched the Ariane 5 rocket which exploded 40 seconds after take off.
- ③ Because they forgot to Black Box test "large values", the ESA lost a rocket worth \$7.5 billion. A very expensive mistake.

7. Name each PARC principle and explain how each is broken by this app.

P Proximity	there are no groups of similar elements (eg buttons, pictures). These should be separated with a space.
A Alignment	everything should follow an alignment (right, left or center). In this app, there are all sorts of alignments.
R Repetition	There is no unity because there are all sorts of different fonts, image styles and button styles.
C Contrast	The most important thing (the title "choose your favourite character") should be contrasted to draw your eye there first. Not the enter button.

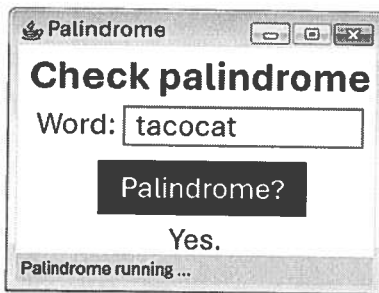


/8

Thinking

8. White Box and Black Box test this app.

/9



A palindrome is a word that reads the same backward as forward.

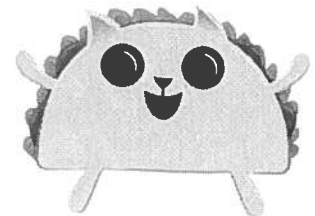
For example "racecar" or "nurses run".

Word	Black Box Test Case
a	small
computer	average
antidisestablishmentarianism	large
@!24A	boundary
Word	White Box Test Case & Line Number
[empty string]	Avoid the loop, line 4
I	Loop once, line 4
banana split	Loop many times, line 4
tacocat	Is a palindrome, line 6
frog.	Isn't a palindrome, line 8

```

1 public void actionPerformed (ActionEvent e) {
2     String s = input.getText();
3     String rev = "";
4
5     for (int i = s.length () - 1 ; i >= 0 ; i--)
6         rev += s.charAt (i);
7
8     if (rev.equals (s))
9         output.setText ("Yes");
10    else
11        output.setText ("No");
12 }

```



9. Decrypt the following messages. This chart may be useful:

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z

kpmmz sphfs (caesar)
jolly roger

draebkcalb (mirror writing)
blackbread

iratepay hipsay (pig Latin)
pirate ship

15 14 5 16 9 5 3 5 (number code)
o n e p i e c e

Hint: ^{pirate ship} lagiwm vfal = pirate ship, Hint #2: All punctuation ', . is at it appears.

wfm fillamvw lagiwm ligwamv rmig wfmag vfal'v lamg.
the happiest pirate parties near their ship's pier.

wfmo prmigwmb wfmag fmigw'v bmvagm, i villfagm.
they unearthed their heart's desire, a sapphire.

Application

10. This is the original String: String p = "King of the Pirates";

/10

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
K	I	N	G		O	F		T	H	E		P	I	R	A	T	E	S

Write the code to produce the following output:

(a)	KING OF THE PIRATES	System.out.println(p.toUpperCase());
(b)	king of the pirates	System.out.println(p.toLowerCase());
(c)	g	System.out.println(p.charAt(3));
(d)	Kyng of the Pyrates	System.out.println(p.replace('i', 'y'));
(e)	rates	System.out.println(p.substring(14, 19));
(g)	19 //the length	System.out.println(p.length());
(h)	110 //ASCII of n	System.out.println((int) p.charAt(2));
(i)	6 //position of f	System.out.println(p.indexOf('f'));
(j)	thing	System.out.println(p.substring(8, 10) + p.substring(1, 4));
(k)	KING	System.out.println(p.toUpperCase().substring(0, 4));

11. Make a loop to print all of the positions of the e's and the E's on the screen. Note that indexOf will not be able to do this, as it only returns the first value.

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Example 1: Input? Monkey D. Luffy 4	Example 2 Input? Sanji none	Example 3 Input? EeAbEp 0 1 4	Example 4 Input? Nothing entered
-------------------------------------------	-----------------------------------	-------------------------------------	----------------------------------------

```
String s = IO.inputString(" Input? ");
```

```
//Handle nothing entered
```

```
if(s. equals (""))
```

```
System.out.println(" Nothing entered ");
```

Example 4



```
//Otherwise, they entered something, count the e's and E's  
else {
```

```
//variable to hold index values of E or e  
String ans = "";
```

```
//loop through String
```

```
for( int i=0; i<s.length(); i++ ,
```

```
{  
    //Check current place for E or e  
    if ( s.charAt(i)=='e' || s.charAt(i)=='E' ) {
```

```
        //Add current place to index variable
```

```
        ans+= " " + i ;
```

```
}
```

```
//Results of loop -----
```

```
//if no index values, ans is empty. Print none
```

```
if(ans. equals (""))
```

```
System.out.println(" none ");
```

```
//otherwise, display all index values stored in ans
```

```
else
```

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

```
}
```

Example 2

12. (a) Fill in init for the Encryption App (shown in on the right)

```
import java.awt.*; import javax.swing.*; import java.awt.event.*;
public class Encrypt extends Applet implements ActionListener
{
```

JTextField word;

//The other global variable:

JLabel output;

public void init ()

{ resize (300, 100);

//The first label: (Font is Arial, Font.BOLD and 30 pt)

JLabel title = new JLabel ("Encryption");

title.setFont (new Font ("Arial", Font.BOLD, 30));

//The prompt

JLabel pmt = new JLabel ("Word:");

//The textfield:

word = new JTextField (8);

//The button: (Black background, white writing)

JButton b = new JButton ("Encrypt it!");

b.setBackground (Color.black);

b.setForeground (Color.white);

b.addActionListener (this);

b.setActionCommand ("clicked");

//The last label:

output = new JLabel ("Enter a word.");

//add the widgets:

add (title);

add (pmt);

add (word);

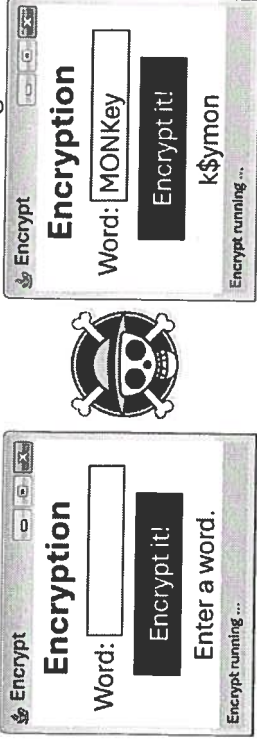
add (b);

add (output);

} //init

green circle must match.

(b) Fill in the Encryption App's actionPerformed using the comments.



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public void actionPerformed (ActionEvent e)

{ if (e.getActionCommand().equals ("clicked"))

{ String s = word.getText();

//switch it to lowercase

s = s.toLowerCase()

//replace all 'a' with '@'

s = s.replace ('a', '@');

//replace all 'e' with '\$'

s = s.replace ('e', '\$');

//chop the string in half

String first = s.substring (0, s.length()/2);

String last = s.substring (s.length()/2, s.length());

//switch the order of the two halves

s = last + first;

//output the s variable on the screen in the JLabel

output.setText (s);

} //if

} //actionPerformed

} //Applet