

Assignment Three

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1 Question One

```
<void> <id, cube> <( <float> <id, y> <)> <{>
  <if> <( <id, y> <comparison, >> <number, 3.14159> <)> \\
    <return> <id, y> <mult_op> <id, y> <mult_op> <id, y>
  <return> <number, -1>
<}>
```

2 Question Two

f	o	r		(	i	n	t
	i	=	3	;		i	<
1	8	;		+	+	i	)
	{	}					

The first buffer is filled twice. The second is filled once, and the last contains three elements.

3 Question Three

Strings starting and ending with "x" with any number of x or y's in between.

4 Question Four

4.1 a

col(o|ou)r

4.2 b

m(o|u)m

4.3 c

analy(z|s)e

5 Question Five

5.1 a

1. bbbaa
2. bbbcc
3. bbbac
4. bbbca

5.2 b

1. bbb
2. aa
3. cc
4. ac
5. ca

5.3 c

1. bbb
2. acac

5.4 d

1. bbbacac

6 Question Six

6.1 a

```
In [1]: ["aggie"[0:n] for n in range(0, len("aggie")+1)]
Out[1]: ['', 'a', 'ag', 'agg', 'aggi', 'aggie']
```

6.2 b

```
In [3]: ["aggie"[n:len("aggie")] for n in range(0, len("aggie")+1)]
Out[3]: ['aggie', 'ggie', 'gie', 'ie', 'e', '']
```

6.3 c

```
In [4]: ["aggie"[0:n] for n in range(1, len("aggie"))]
Out[4]: ['a', 'ag', 'agg', 'aggi']
```

6.4 d

```
In [8]: def subs(s):
...:     proper_substrings = set()
...:     for i in range(len(s)+1):
...:         for j in range(len(s)+1):
...:             if (i <= j):
...:                 sub = s[i:j]
...:                 if (sub != "" and sub != s):
...:                     proper_substrings.add(sub)
...:     return proper_substrings
...:
```

```
In [9]: subs("aggie")
```

```
Out[9]:
```

```
{'a',
 'ag',
 'agg',
 'aggi',
 'e',
```

```
'g',
'gg',
'ggi',
'ggie',
'gi',
'gie',
'i',
'ie'}
```

7 Question Seven

$(u|U)(n|N)(i|I)(o|O)(n|N)$

8 Question Eight

$\$([0-9][0-9]^2|[0-9]^3)(,[0-9]^3)^*.[0-9][0-9]$

9 Question Nine

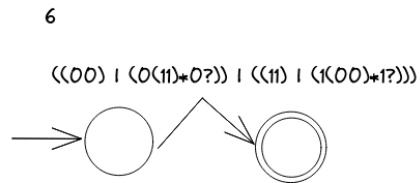
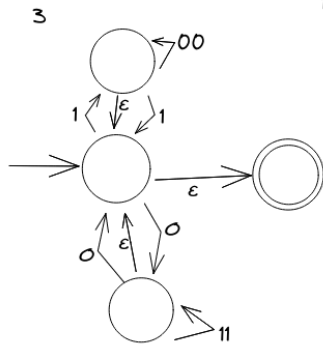
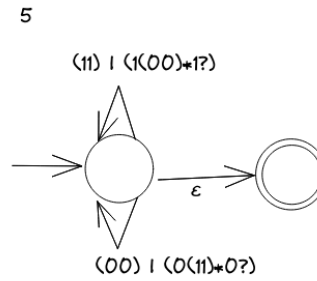
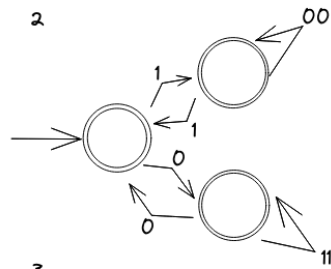
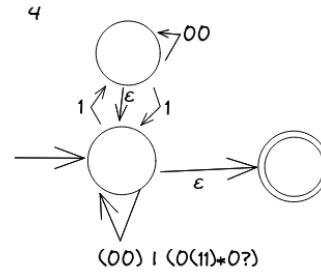
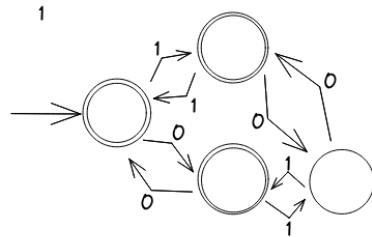
nonzeroDigit $\Rightarrow$ 1|2|3|4|5|6|7|8|9|A|B|C|D|E|F
 hex $\Rightarrow$ nonzeroDigit⁺(0|nonzeroDigit)*

10 Question Ten

10.1 a

$(0011)^*|(1100)^*$

10.2 b



$((00) \mid (0(11)^*0?)) \mid ((11) \mid (1(00)^*1?))$

10.3 c

$a?b?c?d?$

11 Question Eleven

11.1 a

$(\backslash t|)^+$

11.2 b

$(/\backslash^*)[\wedge(* /)]*(\backslash^*/)$

11.3 c

$"[\wedge"]^*"$

12 Question Twelve

$\text{nonVowelPart} \Rightarrow [\wedge \text{aeiou}]^*$

$\text{aPart} \Rightarrow \text{a}^+[\wedge \text{eiou}]^*$

$\text{ePart} \Rightarrow \text{e}^+[\wedge \text{aiou}]^*$

$\text{iPart} \Rightarrow \text{i}^+[\wedge \text{aeou}]^*$

$\text{oPart} \Rightarrow \text{o}^+[\wedge \text{aeiu}]^*$

$\text{uPart} \Rightarrow \text{u}^+[\wedge \text{aeio}]^*$

$\text{str} \Rightarrow (\text{nonVowelPart})(\text{aPart})(\text{ePart})(\text{iPart})(\text{oPart})(\text{uPart})$