Quiz 06–20: Lists and Sets — Solution Sheet

Part A — Lists + For-loops (focus)

1) Build a list

```
items = [7, "hi", 0, "bye"]
```

2) Index and update

Output:

```
[10, 6, 8, 2]
```

3) `append` + `pop`

Output:

```
D
['A', 'B', 'C', 'E']
```

4) Double each number

Fill in:

```
x * 2
```

5) Count items in a list

Output:

```
4
```

6) Find the largest value

One correct solution:

```
numbers = [12, 5, 20, 8, 20, 3]

largest = numbers[0]
for x in numbers:
    if x > largest:
        largest = x

print(largest)
```

Output: `text 20`

7) Max value + first index

Fill in:

```
numbers[i] > max_value
numbers[i]
i
```

Completed code + output:

```
numbers = [4, 9, 2, 9, 1]

max_value = numbers[0]
max_index = 0

for i in range(len(numbers)):
    if numbers[i] > max_value:
        max_value = numbers[i]
        max_index = i

print(max_value)
print(max_index)
```

Output:

```
9
1
```

8) Filter out zeros

Fill in:

```
x != 0
nonzeros.append(x)
```

Completed code + output:

```
numbers = [0, 3, 0, 2, 5, 0, 1]

nonzeros = []
for x in numbers:
    if x != 0:
        nonzeros.append(x)

print(nonzeros)
```

Output:

```
[3, 2, 5, 1]
```

9) Sum only the even numbers

Fill in:

```
x % 2 == 0
total = total + x
```

Completed code + output:

```
numbers = [3, 4, 7, 2, 9, 10]

total = 0
for x in numbers:
    if x % 2 == 0:
        total = total + x

print(total)
```

Output: `text 16`

10) Nested loops over a list

Answer: **6**

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11) Swap inside a list

Output:

```
[8, 9, 1, 5]
```

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12) Membership check

Fill in:

```
True
```

Output:

```
False
```

Part B — Sets + List/Set synergy (focus)

13) List → set

1) One possible printed set (order may vary): `{2, 3, 5, 7}`
2) `len(s) = 4`

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14) Membership on a set

Output:

```
False
True
```

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15) Set operations

- `A | B` = `{1, 2, 3, 4, 5, 6}`
- `A & B` = `{3, 5}`
- `A - B` = `{1, 2}`
- `B - A` = `{4, 6}`

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16) Count unique numbers

Fill in:

```
set()
not in
add(x)
count + 1
```

One completed solution + output:

```
numbers = [1, 1, 2, 3, 3, 3, 5]

count = 0
seen = set()

for x in numbers:
    if x not in seen:
        seen.add(x)
        count = count + 1

print(count)
```

Output:

```
4
```

---

17) All unique?

Fill in:

```
set()
True
False
break
add(x)
```

One completed solution + output:

```
letters = ["A", "B", "C", "B"]

seen = set()
unique = True

for x in letters:
    if x in seen:
        unique = False
        break
    seen.add(x)

print(unique)
```

Output:

```
False
```

18) Remove duplicates but keep order

Fill in:

```
[]
set()
not in
append(w)
add(w)
```

One completed solution + output:

```
words = ["to", "be", "or", "not", "to", "be"]

unique_words = []
seen = set()

for w in words:
    if w not in seen:
        unique_words.append(w)
        seen.add(w)

print(unique_words)
```

Output:

```
['to', 'be', 'or', 'not']
```

19) Common items from two lists

One correct solution:

```
a = ["red", "blue", "blue", "green"]
b = ["green", "yellow", "blue"]

sa = set(a)
sb = set(b)
print(sa & sb)
```

Output (order may vary):

```
{'blue', 'green'}
```

20) Filter using a “banned” set

Fill in:

```
[]
x not in banned
append(x)
```

One completed solution + output:

```
numbers = [5, 2, 9, 2, 7, 1, 9]
banned = {2, 9}

allowed = []

for x in numbers:
    if x not in banned:
        allowed.append(x)

print(allowed)
```

Output:

```
[5, 7, 1]
```

Part C — Number loops

21) Factors into a list

Fill in:

- `factors = []`
- `range(1, n + 1)`
- `n % i == 0`
- `factors.append(i)`

One completed solution + output:

```
n = 18

factors = []

for i in range(1, n + 1):
    if n % i == 0:
        factors.append(i)

print(factors)
```

Output:

```
[1, 2, 3, 6, 9, 18]
```

22) Sum of digits (while-loop)

Fill in:

```
n % 10
total + x
n // 10
```

One completed solution + output:

```
n = 2405
total = 0

while n > 0:
    x = n % 10
    total = total + x
    n = n // 10

print(total)
```

Output:

```
11
```

23) Count digits (while-loop)

Fill in:

```
n > 0
count + 1
n // 10
```

One completed solution + output:

```
n = 90700

count = 0
while n > 0:
    count = count + 1
    n = n // 10

print(count)
```

Output:

```
5
```