

1.
def remove_vowels(s):
 vowels = "aeiouAEIOU"
 return "".join(char for char in s if char not in vowels)

print(remove_vowels("Hello World"))

2.
def remove_odd_index(s):
 return s[::2]

print(remove_odd_index("Hello World"))

3.
def is_palindrome(s):
 for i in range(len(s) // 2):
 if s[i] != s[-(i + 1)]:
 return False
 return True

print(is_palindrome("madam"))

4.
def replace_spaces(s):
 return s.replace(' ', '*') if ' ' in s else f"\${s}"

print(replace_spaces("Hello World"))
print(replace_spaces("NoSpaces"))

5.
def slice_string(s):
 return s[1::2], s[0::2]

print(slice_string("HelloWorld"))

6.
def remove_substring(s, sub):
 return s.replace(sub, "")

print(remove_substring("abcabcabc", "abc"))

7.
def to_uppercase(s):
 return s.upper()

```
print(to_uppercase("hello world"))
```

8.

```
def replace_substring(s, old, new):  
    return s.replace(old, new)
```

```
print(replace_substring("apple apple", "apple", "orange"))
```

9.

```
def reverse_halves(s):  
    mid = len(s) // 2  
    return s[:mid][::-1] + s[mid:][::-1]
```

```
print(reverse_halves("abcdefgh"))
```

10.

```
import re
```

```
def is_valid_password(pwd):  
    if (len(pwd) >= 6 and  
        re.search("[a-zA-Z]", pwd) and  
        re.search("[0-9]", pwd) and  
        re.search("[$#@]", pwd)):  
        return "Valid Password"  
    return "Invalid Password"
```

```
print(is_valid_password("Passw0rd@"))
```

11.

```
def decimal_to_binary(n):  
    return bin(n)[2:]
```

```
print(decimal_to_binary(10))
```

12.

```
def binary_to_decimal(b):  
    return int(b, 2)
```

```
print(binary_to_decimal("1010"))
```

13.

```
import math

def area_of_circle(radius):
    return math.pi * radius ** 2

print(area_of_circle(5))
```

14.

```
import math

def nCr(n, r):
    return math.comb(n, r)
```

Here are the Python programs for the given tasks:

15.

```
def factorial(n):
    if n == 0 or n == 1:
        return 1
    else:
        return n * factorial(n-1)

def nCr(n, r):
    return factorial(n) // (factorial(r) * factorial(n-r))

# Example usage
n = int(input("Enter n: "))
r = int(input("Enter r: "))
print(f"nCr({n}, {r}) = {nCr(n, r)}")
```

16.

```
def is_even_or_odd(num):
    return "Even" if num % 2 == 0 else "Odd"

def check_number(num):
    if num > 0:
        return "Positive"
    elif num < 0:
        return "Negative"
    else:
        return "Zero"
```

```
def generate_factors(num):
    return [i for i in range(1, num + 1) if num % i == 0]
```

```
while True:
    print("\nMenu:")
    print("1. Check Even or Odd")
    print("2. Check Positive, Negative, or Zero")
    print("3. Generate Factors")
    print("4. Exit")
```

```
choice = int(input("Enter your choice: "))
if choice == 4:
    break
num = int(input("Enter a number: "))
```

```
if choice == 1:
    print(is_even_or_odd(num))
elif choice == 2:
    print(check_number(num))
elif choice == 3:
    print("Factors:", generate_factors(num))
else:
    print("Invalid choice!")
```

17.

```
import math
```

```
def sin_series(x, n):
    result = 0
    for i in range(n):
        result += ((-1) ** i) * (x ** (2 * i + 1)) / math.factorial(2 * i + 1)
    return result
```

```
x = float(input("Enter value of x in radians: "))
n = int(input("Enter number of terms: "))
print(f"sin({x}) ≈ {sin_series(x, n)}")
```

18.

```
def factorial(n):
    if n == 0:
        return 1
    return n * factorial(n-1)
```

```
num = int(input("Enter a number: "))
```

```
print(f"Factorial of {num} is {factorial(num)}")
```

19.

```
def fibonacci(n):  
    if n <= 1:  
        return n  
    return fibonacci(n-1) + fibonacci(n-2)  
  
num = int(input("Enter n: "))  
print(f"{num}th Fibonacci number is {fibonacci(num)}")
```

20.

```
names = input("Enter names separated by spaces: ").split()  
names.sort()  
print("Sorted names:", names)
```

21.

```
nums = list(map(int, input("Enter numbers separated by spaces: ").split()))  
even_sum = sum(num for num in nums if num % 2 == 0)  
print("Sum of even numbers:", even_sum)
```

22.

```
text = input("Enter the string: ")  
words_to_remove = input("Enter words to remove separated by spaces: ").split()  
for word in words_to_remove:  
    text = text.replace(word, "")  
print("Resulting string:", text.strip())
```