CHECK 1: EXAMPLE FROM OUTLINE

```
UPDATED\*task3_code.sh
Enter non-negative integer values for a, b, and c:
a: 1
b: 2
c: 0
Enter natural number values for range [n1, n2]:
n1: 2
n2: 4
Valid input for a, b, and c: values are non-negative integers.
Valid input for n1 and n2: values are natural numbers and n1 <= n2.
The terms of the sequence are:
12 33 72
The product of the first and last terms is: 864
The product is a multiple of 4.
```

CHECK 2

```
Enter non-negative integer values for a, b, and c:
a: 1
b: 1
c: 4
Enter natural number values for range [n1, n2]:
n1: 3
n2: 6
Valid input for a, b, and c: values are non-negative integers.
Valid input for n1 and n2: values are natural numbers and n1 <= n2.
The terms of the sequence are:
34 72 134 226
```

$n = 3 \quad 3^3 + 3 + 4 = 34$ $\quad n = 5 \quad 5^3 + 5 + 4 = 134$
$n = 4 \quad 4^3 + 4 + 4 = 72$ $\quad n = 6 \quad 6^3 + 6 + 4 = 226$

The product of the first and last terms is: 7684 $(34 \times 226 = 7684)$
The product is a multiple of 4. $(7684 \div 4 = 1921)$

CHECK 3

```
Enter non-negative integer values for a, b, and c:
a: -1
b: 2
c: 0
Enter natural number values for range [n1, n2]:
n1: 0
n2: 2
Invalid input for a, b, and c: values must be non-negative integers.
```

CHECK 4

```
Enter non-negative integer values for a, b, and c:
a: 2
b: 0
c: 1
Enter natural number values for range [n1, n2]:
n1: 3
n2: 5
Valid input for a, b, and c: values are non-negative integers.
Valid input for n1 and n2: values are natural numbers and n1 <= n2.
The terms of the sequence are:
55 129 251
```

$n = 3 \quad 2(3^3) + 1 = 55$ $\quad n = 4 \quad 2(4^3) + 1 = 129$ $\quad n = 5 \quad 2(5^3) + 1 = 251$

The product of the first and last terms is: 13805 $(55 \times 251 = 13805)$
The product is not a multiple of 4. $(13805 \div 4 = 3451.25)$

```
#!/bin/bash

# Input a, b, c, n1, and n2 values
echo "Enter non-negative integer values for a, b, and c: "
    read -p "a: " a
    read -p "b: " b
    read -p "c: " c
echo "Enter natural number values for range [n1, n2]: "
    read -p "n1: " n1
    read -p "n2: " n2

# Validate non-negative integer input (a, b, and c)
if (( a >= 0 && b >= 0 && c >= 0 )); then
    echo "Valid input for a, b, and c: values are non-negative integers."
else
    echo "Invalid input for a, b, and c: values must be non-negative integers."
    exit 1
fi

# Validate natural number input (n1 and n2)
if (( n1 >= 1 && n2 >= 1 && n1 <= n2 )); then
    echo "Valid input for n1 and n2: values are natural numbers and n1 <= n2."
else
    echo "Invalid input for n1 and n2: values must be natural numbers and n1 <= n2."
    exit 1
fi

# Print sequence terms
echo "The terms of the sequence are:"
terms=()
for ((n = n1; n <= n2; n++)); do
    term=$(echo "$a * ($n^3) + $b * $n + $c" | bc)
    terms+=("$term")
done
echo "${terms[@]}"

# Calculate product of first and last terms
first_term=$(echo "$a * ($n1^3) + $b * $n1 + $c" | bc)
last_term=$(echo "$a * ($n2^3) + $b * $n2 + $c" | bc)
product=$(echo "$first_term * $last_term" | bc)
echo "The product of the first and last terms is: $product"

# Check if product is a multiple of 4
if ((product % 4 == 0)); then
    echo "The product is a multiple of 4."
else
    echo "The product is not a multiple of 4."
fi
```