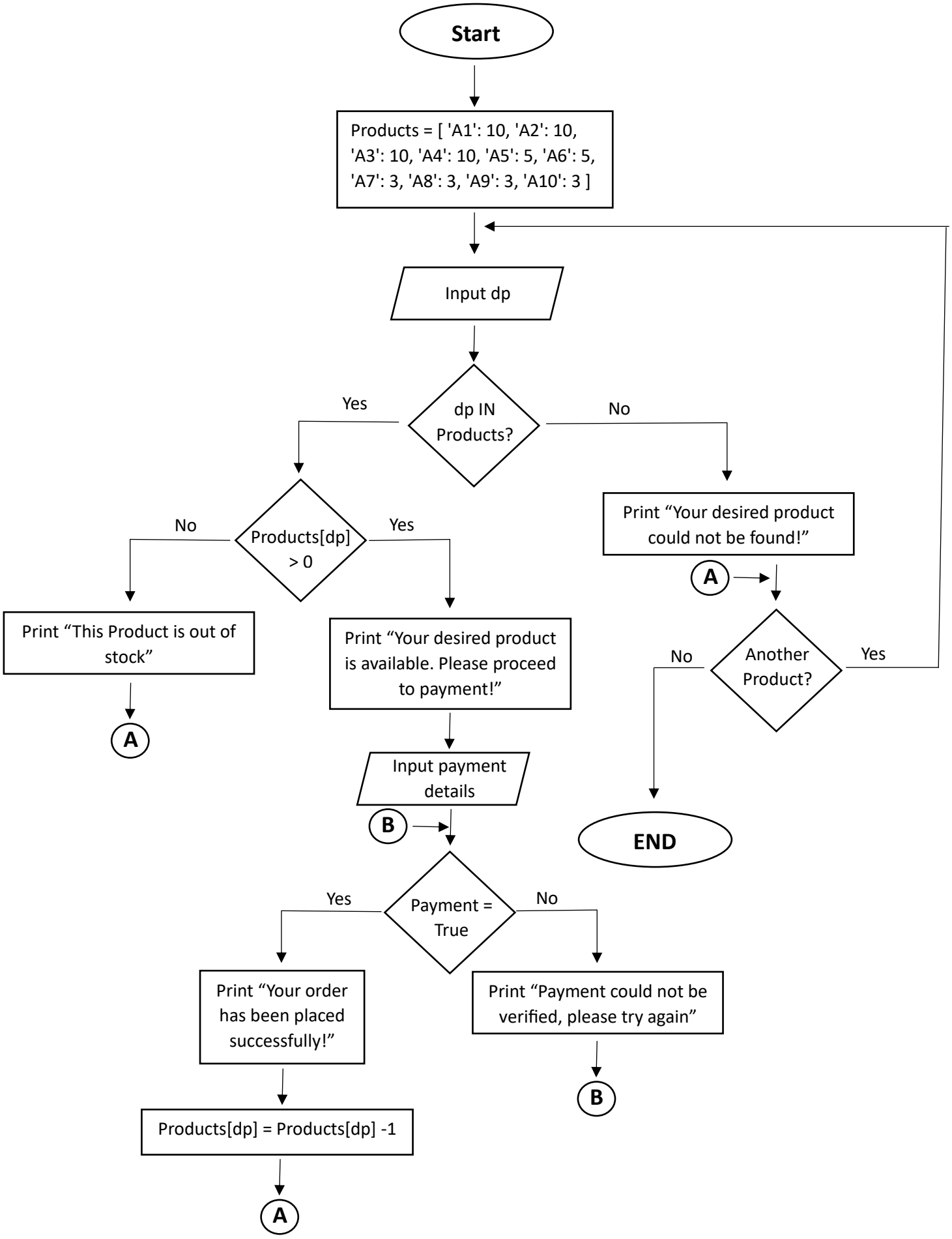
Lab 02 Assignment

Flowchart Task:

You are working in an e-commerce company and need to design a flowchart for processing an online order. The flowchart should include process modules for each step involved in handling an order and decision structures to handle stock availability and payment verification.

1. Start
2. Set Products = A1:A10
3. A1:A4 = 10
4. A1,A5 = 5
5. A7:10 = 3
6. Input desired product(dp)
7. If dp in Products
    a. If Products[dp] > 0
        i. Print “Your desired product is available, please proceed to payment.”
        ii. Input payment details
        iii. If payment = True
            1. Print “Your order has been placed successfully”
            2. Products[dp] = Products[dp] – 1
            3. Go to 8(b)
        iv. Else
            1. Print ”Payment could not be verified, please try again ”
            2. Go to 7(a(ii))
    b. Else
        i. Print ”This product is out of stock”
        ii. Go to 8(b)
8. Else
    a. Print “Your desired product could not be found.”
    b. Condition “another product?”
        i. Yes: Go to 6
        ii. No: End


Start
Products = ['A1': 10, 'A2': 10, 'A3': 10, 'A4': 10, 'A5': 5, 'A6': 5, 'A7': 3, 'A8': 3, 'A9': 3, 'A10': 3]
Input dp
dp IN Products?
Yes
No
Products[dp] > 0
No
Yes
Print "This Product is out of stock"
A
Print "Your desired product is available. Please proceed to payment!"
Input payment details
B
Payment = True
Yes
No
Print "Your order has been placed successfully!"
Products[dp] = Products[dp] -1
A
Print "Payment could not be verified, please try again"
B
Print "Your desired product could not be found!"
A
Another Product?
No
Yes
END

Pseudocode Tasks:

1. Find if the number is multiple of 5.

```
START

INPUT number

IF number % 5 == 0 THEN
        PRINT "The number is a multiple of 5"
ELSE
        PRINT "The number is not a multiple of 5"
END
```

2. Check if a character is uppercase or lowercase.

```
START

INPUT char

SET sum to 0

SET sum to number1 + number2

IF char == Uppercase(char) THEN
        PRINT "The character is Uppercase"
ELSE IF char == Lowercase(char) THEN
        PRINT "The character is Lowercase"
END
```

3. Create a small calculator which only does '+' or '*'Operations. (Hint: Take three variable inputs with one being used for the operator)

```
START

INPUT number1
INPUT operator
INPUT number2

SET sum to 0

SET sum to number1 + number2
SET product to number1 * number2

IF operator == "+" THEN
        PRINT sum
ELSE IF operator == "*" THEN
        PRINT product
ELSE
        PRINT "Wrong operator chosen"
END
```

4. Check whether a given number is positive, negative, or zero.

1. START
2.
3. INPUT num
4.
5. IF num > 0 THEN
6. PRINT “The number is positive”
7. ELSE IF num < 0 THEN
8. PRINT “The number is negative”
9. ELSE
10. PRINT “The number is zero”
11. END

5. Determine if a person is a teenager (between 13 and 19 years old).

1. START
2.
3. INPUT age
4.
5. IF age >= 13 AND age <= 19 THEN
6. PRINT “The person is a teenager”
7. ELSE
8. PRINT “The person is not a teenager”
9. END

Algorithm Tasks:

1. Implement an algorithm to determine if a given year is a leap year. A leap year is divisible by 4, but not divisible by 100, except if it is also divisible by 400.

1. Ask the user to enter **year**
2. If the **year** is divisible by 400, **result** = “Leap year”
3. Else if the **year** is divisible by 100, **result** = “Not a leap year”
4. Else if the **year** is divisible by 4, **result** = “Leap year”
5. Else, **result** = “Not a leap year”
6. Print **result**

2. Implement an algorithm to count the number of occurrences of each character in a given string.

1. Ask the user to enter a **string**
2. Create an empty dictionary **charCount** to store character counts
3. Go through each character **char** in the **string**
4. If **char** is not in **charCount**, add it with an initial value of 1
5. Else, increment **char**’s value by 1
6. Display each **char** and it’s count from **charCount**

3. Write an algorithm to calculate x raised to the power y (i.e., x y) without using built-in power functions.

1. Ask the user to enter base **x**
2. Ask the user to enter exponent **y**
3. Set **answer** to **1**
4. If y == 0, THEN jump to step 9
5. Set the **answer** to (**answer** x **base**)
6. **e** = |**y|** – 1
7. If e != 0, THEN go to step 3
8. If y < 0, **answer** = 1/**answer**
9. Display the **answer**

4. Calculate the area of a circle given its radius r.

1. Ask the user to enter radius **r**
2. Set **Area** to (3.14 x **r** x **r**)
3. Print **Area**

5. Find the median of three given numbers.

1. Ask the user to enter number **a**
2. Ask the user to enter number **b**
3. Ask the user to enter number **c**
4. If (**a** > **b** and **a** < **c**) or (**a** < **b** and **a** > **c**), **median** = **a**
5. Else if (**b** > **a** and **b** < **c**) or (**b** < **a** and **b** > **c**), **median** = **b**
6. Else, **median** = **c**
7. Print **median**