وزارة التعليم Ministry of Education 043 المملكة العربية السعودية Kingdom of Saudi Arabia

# Lab 8: Stack app

### Objective(s)

- Practice some stack applications.

#### Tool(s)/Software

Java programming language with NetBeans IDE.

#### Tasks/Assignments(s)

- 1- **Missing Brackets Checking:** Write a method to find if an expression has missing brackets or not using **StackLinkedList**. The method takes a String expression as a parameter and return True if the expression's brackets are correct and False otherwise.
  - If you see a (, [, or {, push it on the stack
  - If you see a ), ], or }, pop the stack and check whether you got the corresponding (, [, or {
  - When you reach the end, check that the stack is empty
     If (stack is empty) Then Correct & Balance
     Else Incorrect & Unbalance [ End If ]

#### Sample outputs:

```
run:

Please enter an expression with parentheses:
[(a+b)]{a-p}
Your expression is correct and balanced
BUILD SUCCESSFUL (total time: 13 seconds)
```

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```
run:
Please enter an expression with parentheses:
[(a+b){a-p}
Your expression is not correct. Unbalanced parentheses
BUILD SUCCESSFUL (total time: 4 seconds)
```

2- Converting Decimal to Binary: Write your own Stack program to implement the following problem. (Discussion board will be available on 3/3/2022 to 6/3/2022) opened from

Consider the following pseudocode to convert Decimal to Binary:

```
Read (number)
Loop (number > 0)

1) digit = number modulo 2
2) print (digit)
3) number = number / 2
```

The problem with this code is that it will print the binary number backwards. (ex: 19 becomes 11001000 instead of 00010011)

To remedy this problem, instead of printing the digit right away, we can **push** it onto the stack. Then after the number is done being converted, we pop the digit out of the stack and **print** it.

#### Deliverables(s)

You are required to implement and deliver a Java program(s) as described in the previous section.

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