Sujit Molleti CS111 Study Guide

Pseudocode

- Purpose: It is an easy way to communicate our algorithm because it is very readable and easy to follow
- It is good way to plan out our code because it is easy to write out and there is no syntax to really get wrong
- Commands: READ, IF, ELSE, WHILE, COMPUTE, HALT, DISPLAY
    - READ is used to read in any values
        - `READ age`
        - `READ time`
        - `READ name`
    - DISPLAY is used to output statements, values, or booleans
        - `DISPLAY "I am going to the gym and reading today"`
    - SET is used to assign values to variables
        - `SET i to 1`
        - `SET birthday to November 10th`
        - `SET ownCar to true`
        - Can you identify the variables in the examples above?
    - IF Statements: IF statements are used to check if something is true or false.
        - `IF time is 12 O'clock THEN`
            - `DISPLAY "It is lunchtime"`
        - `ENDIF`
    - ELSE Statements:
        - Can only come after IF statements, also know that an IF statement and its corresponding ELSE statement CANNOT be true at the same time.
        - You want to use ELSE statements when you want to DISPLAY something when the IF statement is true and when it is false
        - When there is ELSE statement, the ENDIF follows the code after the ENDIF
        - `IF age is greater than or equal to 18 THEN`
            - `DISPLAY "You can vote"`
        - `ELSE`
            - `DISPLAY "You cannot vote"`
        - `ENDIF`

- COMPUTE statements
    - It is used when you want to do any math -- add, subtract, multiply, divide -- and store the information in a variable
    - `COMPUTE x as 4 + 5*2`
    - What is the value of x?
- HALT: are used to stop a linear program or stop a loop
    - **Loops:**
    - `WHILE i < 9`
        - `IF i == 6`
            - `HALT`
        - `ENDIF`
    - `ENDWHILE`
    - `DISPLAY "Cookies and Ice Cream"`
    - **Linear Program:**
    - `IF day is monday`
        - `HALT`
    - `Else if day is Tuesday`
        - `DISPLAY "Taco Tuesday"`
    - What are the outputs for each of the programs?

Conditionals

- Modulus will give you the remainder when dividing numbers
    - It is particularly useful to find out if numbers are divisible by other numbers
        - **Ex.** $10 \bmod 2 = 0$, $9 \bmod 2 = 1$
    - Taking the modulus 10 of a number will allow you to extract the ones place
        - Ex. $256 \bmod 10 = 6$, $25 \bmod 10 = 5$

Java

- Must know the standard lines

```
public class FileName{
    public static void main(String[] args){
```

- Basic Types: int, float, double, char, String --
    - know the relationships between them, how to declare them
- Difference between System.out.println vs System.out.print

Practice Questions

1. The following code compiles and runs, determine the output,

```
int a = 5;
double b = 5;
System.out.println(b);
b = b + a;
System.out.println(b);
b = (int)5 + .32;
System.out.println(b);
if((b % 5) == 0){
  System.out.println("b is divisible by 5");
}
if((int)(b % 5) == 0){
  System.out.println("this runs");
}
```

2. Determine which lines of code run and which one have errors. If there is no error determine the value of the variable,

```
String a = 'a' + 'b';
String c = "hello" + 'a';
double y = 6;
int x = y;
double z = int x = 6;
String t = "21";
int o = Integer.parseInt(t);
char v = '4';
o = Integer.parseInt(v);
```

3. NFL Playoffs Pseudocode question (Medium)

We want to write a simple program in pseudocode to identify a team's playoff status given their amount of wins and their conference(NFC, AFC). If a team has made the playoffs display whether they are playing in the Wild Card Round or if they have a bye week. Note, teams have bye weeks when they are really good and teams that are Wildcards are just good enough for the playoffs.

1. If a team has 9 or more wins they are in the playoffs
2. Any NFC team in the playoffs that has less than 10 wins is a Wild Card team
3. Any AFC team in the playoffs that has less than 12 wins is a Wild Card team
4. Any NFC team with more than 12 wins has a bye week
5. Any AFC team with more than 13 wins has a bye week

You should only be displaying whether a team has failed to make the playoffs, if they are a wildcard team, or if they have a bye week. Note all these events are mutually exclusive.

4. Straight PseudoCode Flush (Medium)

In Poker, a Straight Flush is 5 consecutive cards of the same suit. Given 5 cards, identify if they are a straight flush. For example, if you have 5 cards from the spades suit and their numeric values are 6, 7, 8, 9, A. Then, that is considered a straight flush. Finish the following pseudocode, you can assume that the cards are given in ascending order.

```
READ Card1
READ Card2
READ Card3
READ Card4
READ Card5
//Implement the rest
```

5. Study Tips

- Do I know what the pomodoro method is? Should I use it?
- Can I do problems without looking at the solutions?
- Am I getting enough sleep?
- Am I eating well?
- Do I need a break?

Good luck. **I CAN DO THIS**!!! :)