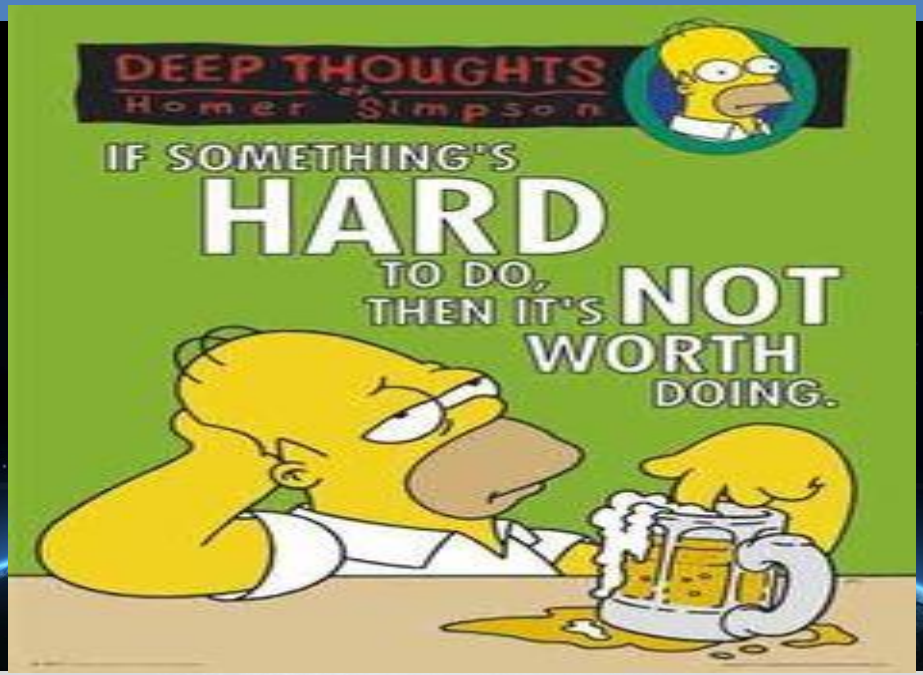


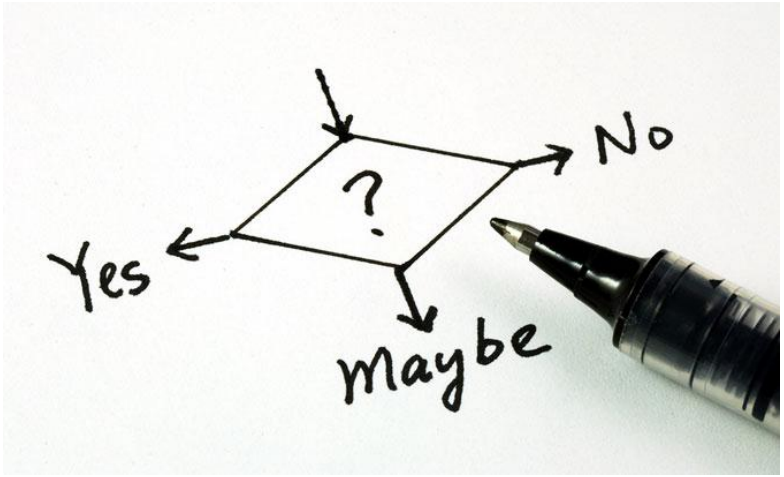
TUTORIAL: DECISION MAKING

BME 121, Fall 2016

Rasoul Nasiri

Topics

- Making a decision
- Logical Variables and comparisons
- If-statement
- If-else
- Logical Operation
  - &&, ||, !=
-



Decision statement

- How should this cat decide?
- Owns:
  - Litter box
  - Fake mouse
- Does not own?
  - Your laptop
  - Your bag
  - …

Boolean Variables

- If something is true
- Boolean variable can have two values
  - true
  - false
- Boolean variables can reflect the status of a concept
  - The cat has litter box: true
  - It is very warm in Canada: false

- See: 1.booleanVar.cs

Boolean values from comparisons

- Comparing two values of the same type to see their relation and use as a Boolean value/variable
- The result of comparison
  - true
  - false
- We can assign the result to
- a boolean variable

Relational Operators

Operators	Meaning	Example	Result
<	Less than	5<2	False
>	Greater than	5>2	True
<=	Less than or equal to	5<=2	False
>=	Greater than or equal to	5>=2	True
==	Equal to	5==2	False
!=	Not equal to	5!=2	True

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- See: 2.Comparisons
- See: 3.RelationalwithParse

Note on string comparisons

- Equality of two strings
  - word1 == word2: is true if they are exactly same
  - word1 != word2: is true if the words are different
- Comparison of strings is case sensitive
- E.g.:
  - Sarah == Sarah : true
  - Sarah != sarah : true
  - Sarah == Saraah: false
  - Sarah != Sarah1: true
- If for some case you can accept both capital and small letter: use TOUpper() and ToLower() functions.
- See: 4.StringComparison.cs

Logical Operators

- Simple Logical statement
  - Single Boolean variable or comparison of values
  - It can be evaluated to true/false
- Complex statement
  - Combination of simple logical statements
  - It can be evaluated to true/false
- Combination is made by logical operators

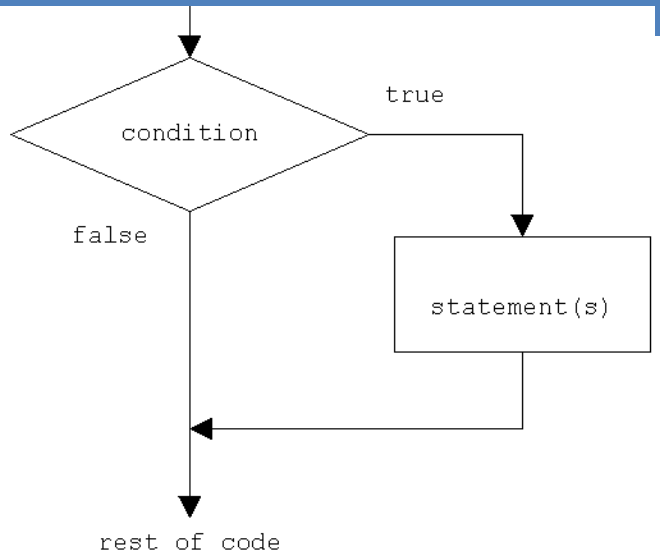
&&	And
||	Or
^	Exclusive or
!	Not

a	b	a && b	a || b	a ^ b	!a
false	false	false	false	false	true
false	true	false	true	true	true
true	False	false	true	true	false
true	true	true	true	false	false

- See: 5.LogicalOperators

If statement

```
if (<Condition>)
{
    <Action 1>
}
```



- E.g.:

```
Bool isOddNumber = (a %2 != 0);
if( isOddNumber== true)
{
…
}
```

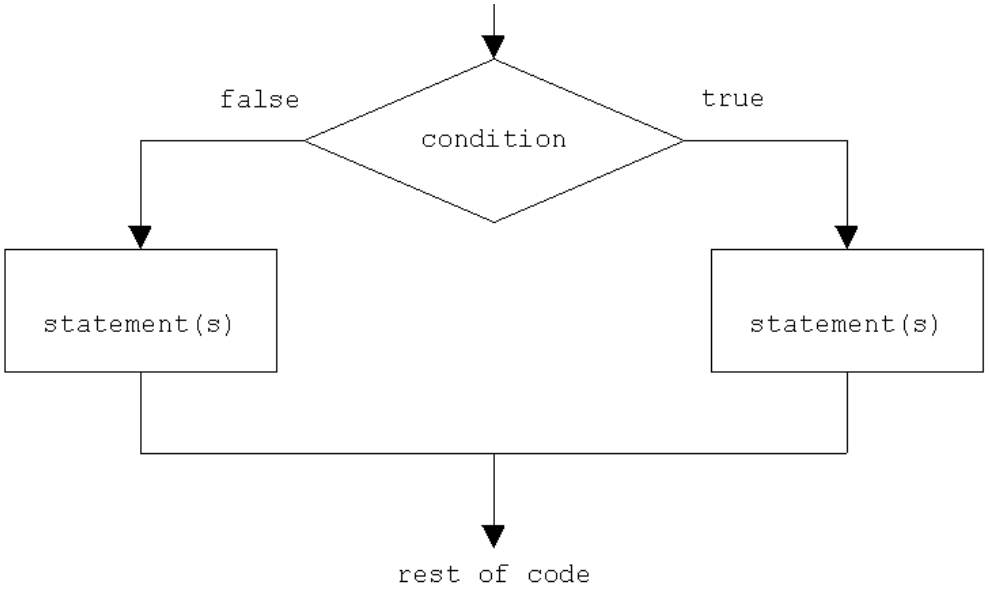
```
Bool isOddNumber = (a %2 != 0);
if( isOddNumber)
{
…
}
```

```
if(a %2 != 0)
{
…
}
```

- See: 6.IfStatement.cs

If-else statement

```
if (<Condition>)
{
    <Action 1>
}
else
{
    <Action 2>
}
<Rest of the program>
```



- See: 7.IfElse.cs

If-else-if

- Detect input values from

WA2

Write a C# program to perform as a simple calculator.

1. Display a title.
2. Prompt the user to enter a number or constant (the constants are e and pi).
3. Prompt the user to enter an operator (from the set + - * / % cos log sqrt).
4. If the operator is not binary (i.e., not one of + - * / %), display the answer.
5. If the operator is binary, prompt the user to enter another number or constant.
6. Display the answer.

- See: WA2.cs,