# INC 141
Computer Programming

Lab 3

Learning Outcomes (Lab 3)

- Use of If-else command

- Submit Task 2,3 to LEB2

Flowcharts

- When commands are not executed in order, flowcharts is useful to keep track of the program execution.

- Often, programmers use flowcharts to organize the order in which actions are to be performed.

- Common flowchart symbols are shown on the next slide.

Flowchart Example
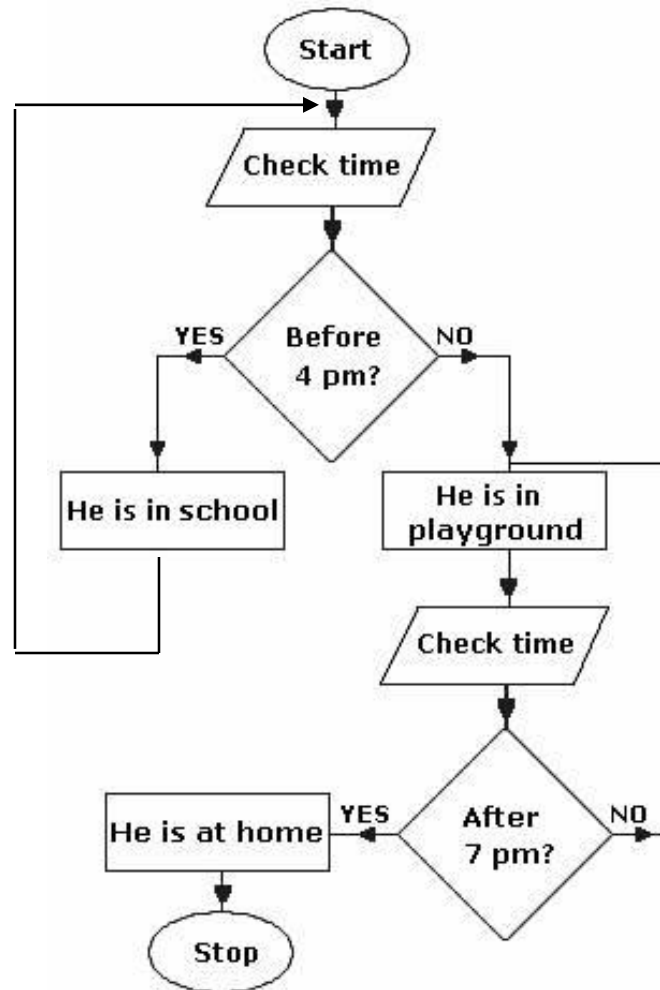
Procedure to find John.
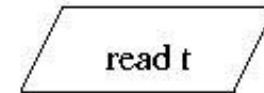
Common Flowchart Symbols

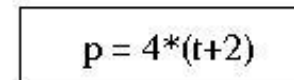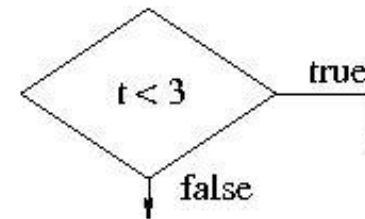|	
Beginning of program	start
Program flowlines	↓ →
Input	read t
Computation	$p = 4*(t+2)$
Comparison	$t < 3$ →true / false
Connectors	(A)
Output	print p
End of program	stop
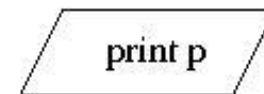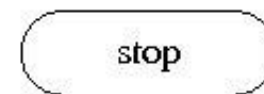
Traverse Flowchart
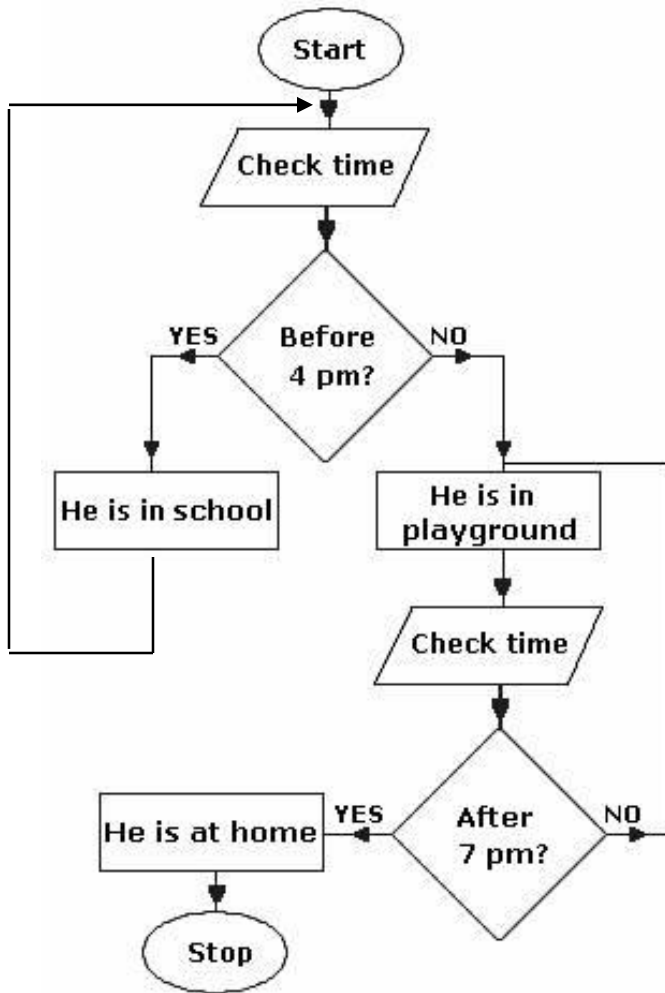
1. **Start**
2. **Check time: 3pm**
3. **At School**
4. **Check time: 5pm**
5. **At Playground**
6. **Check time: 6pm**
7. **At Playground**
8. **Check time: 8pm**
9. **At Home**
10. **Stop**

Find John.

Flowchart for an if-Statement

– The syntax for an if-statement is as follows:

```
if(expression)
    statement
```
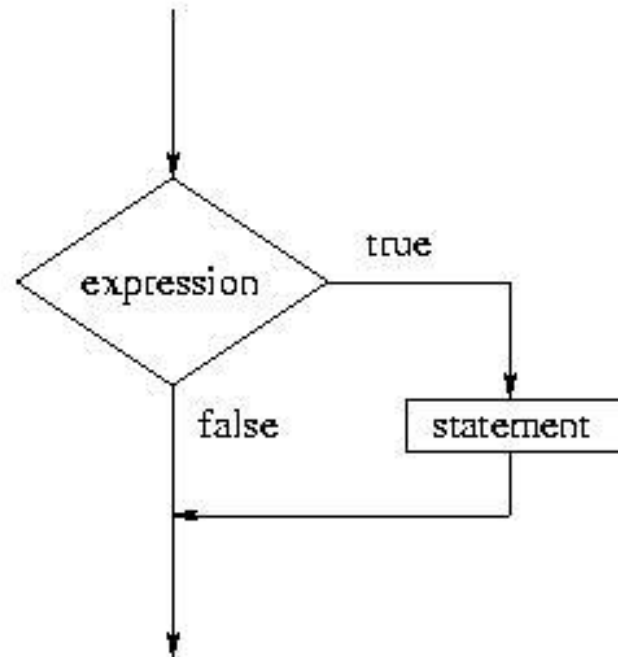
Task 1

Write a program that calculate an absolute value of a number and print the result on screen.
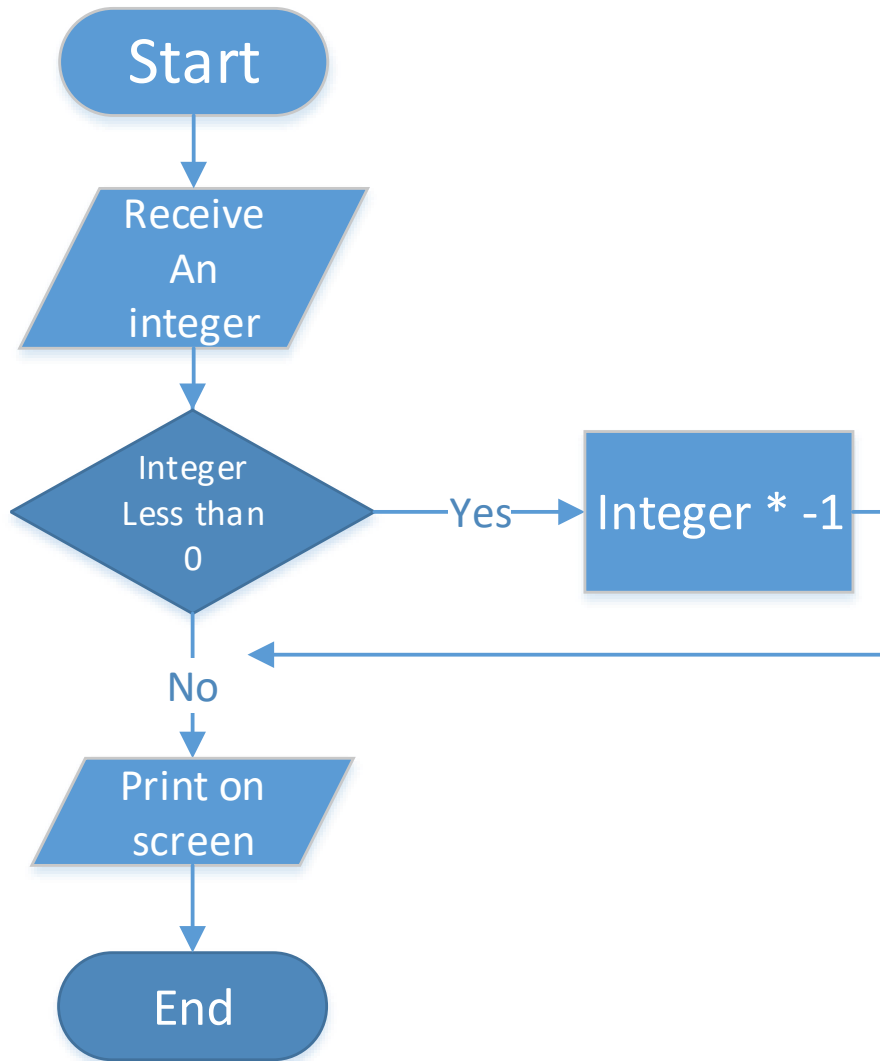
- **Receive 1 integer from the keyboard**

- **Calculate the absolute value**

- **Show the result on screen**

You must follow the flowchart on the next page.

Flowchart

Calculate Absolute

Start

Receive An integer

Integer Less than 0

Yes → Integer * -1

No

Print on screen

End

• If-else Statements

– The syntax for an if-else statement is as follows:

```
if(expression)
    statement1
else
    statement2
```

– The statement1 is executed if the expression compared is unequal to 0, else statement2 is executed.

```
if (i == 5)
{
```

//commands if i equal 5
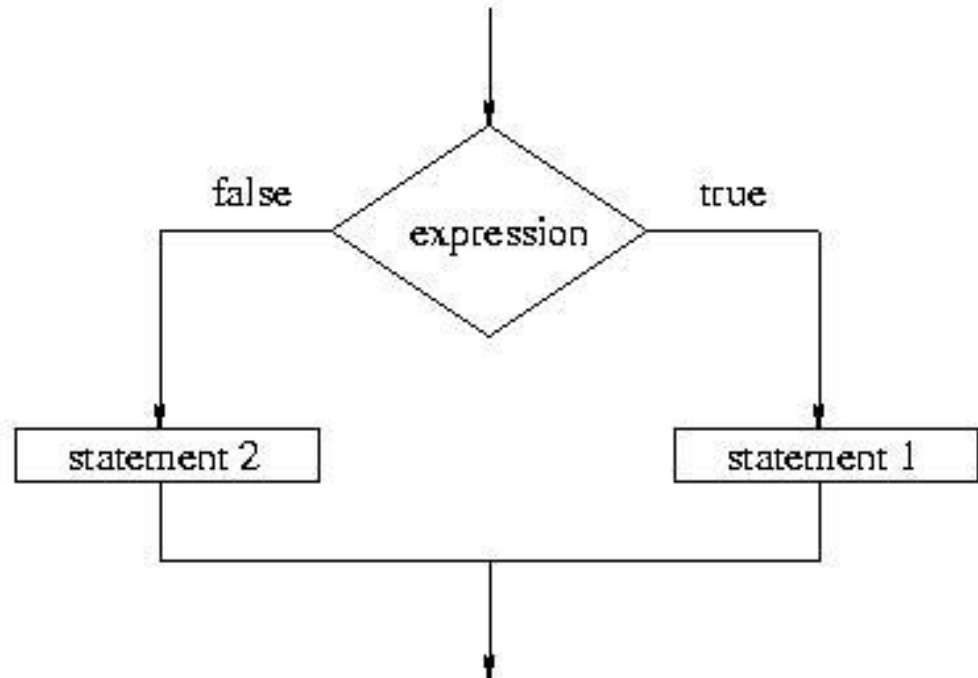
```
}
else
{
```

//commands if i not equal 5

```
}
```

Note: Use { } will be more clear

Flowchart of an if-else Statement

– The syntax for an if-else statement is as follows:

```
if(expression)
    statement1
else
    statement2
```

Study Tasks

Group (breakout room)
- **Discuss with friends and write a flowchart.**
- **Use a whiteboard to draw the flowchart.**
- **Call instructor to check before the next step.**

Individual
- **Write a program <u>according to your flowchart.</u>**
- **Take a snapshot and submit to LEB2.**

Task 2 (submit to LEB2)

Write a flowchart that tells whether the received number is odd or even.

- **Receive 1 integer from the keyboard**

- **Calculate modulo 2**

- **Print odd or even on the screen**

Hint: Use modulo 2 to differentiate odd/even

After finish the flowchart, show it to the teacher, and start writing a program.

Ternary Operator
a short form of if..else

```
if(a<0)

    b = (a*-1);

else

    b = a;
```

Can be replaced with

```
b = (a<0)? (a*-1) : a
```

• **Multiple Else-if Statements**

- The syntax for the else-if statement is as follows:

```
if(expression1)
    statement1
else if(expression2)
    statement2
else if(expression3)
    statement3
else
    statement4
```
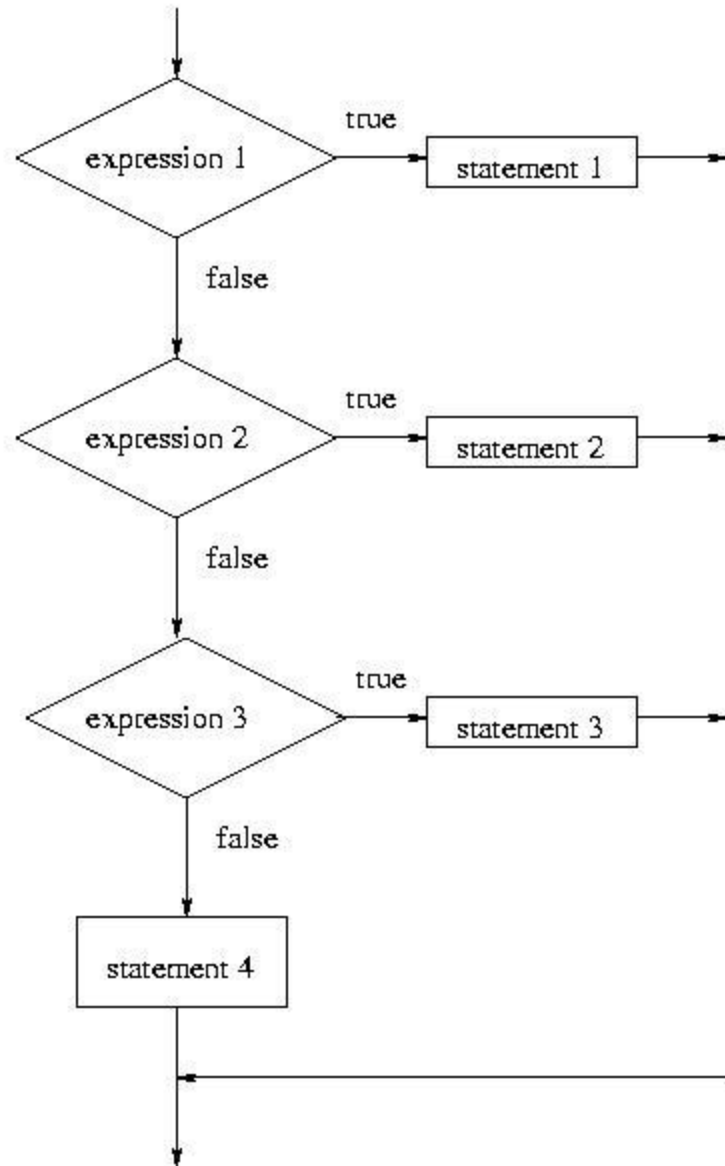
- Semantically, the syntax of the else-if statement is an extension of the previous if-else
statement.

Flowchart of an else-if Statement

The syntax for an else-if statement is as follows:

```
if(expression1)
    statement1
else if(expression2)
    statement2
else if(expression3)
    statement3
else
    statement4
```

Task 3 (submit to LEB2)

Write a flowchart/program that print grade from the score entered.

- Receive a score from the keyboard

- Print grade A,B,C,D,F according to this range

A   100-80   B   70-79   C   60-69

D   50-59   F   0-49