University of Technology
الجامعة التكنولوجية

Computer Science Department
قسم علوم الحاسوب

أساسيات البرمجة

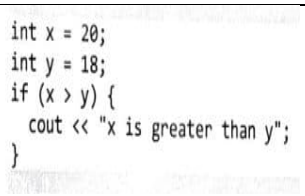
أ.م.د بشار سعدون ، م. ياسر منذر
م.د انمار علي ، م. رشا اسماعيل

cs.uotechnology.edu.iq

Programming Fundamentals
First class // First course

<table>
<tr><td>Lecture 1</td><td>Get to know the program environment</td></tr>
<tr><td>Lecture 2</td><td>- Define variables
- Using “Cout” keyword</td></tr>
<tr><td>Lecture 3</td><td>Using “cin” keyword
<table>
<tr><td>#include <iostream.h>
Void main()
{ int a;
Cin >>a;
Cout << a << endl;
}</td><td>#include <iostream.h>
Void main()
{ int a , b=7;
float f;
Cin >>a >> f;
F= a*6;
Cout << a << endl;
Cout <<f;
}</td></tr>
</table></td></tr>
<tr><td>Lecture 4</td><td>using “cin” and “cout” with various data type
<table>
<tr><td>#include <iostream.h>
Void main()
{ int a=6,b;
Float area;
cin >>b;
area= a/b;
Cout <<” area=” <<area<< endl;
}</td><td>#include <iostream.h>
Void main()
{ int a ;
char ch=’f’;
char yn;
Cin >>yn ;
a=64;
Cout << yn << endl;
Cout <<”the value of a is “<<a;
}</td></tr>
</table>
<table>
<tr><td>#include <iostream.h>
Void main()
{ int a,b;
float r;
cin >>a>>b;
r=a+b;
cout <<”a+b=”<<r<<endl;
r=a-b;
cout <<”a-b=”<<r<<endl;
r=a*b;
cout <<”a*b=”<<r<<endl;
r=a/b;
cout <<”a/b=”<<r<<endl;
}</td><td></td></tr>
</table></td></tr>
</table>

Programming Fundamentals
First class // First course

<table>
<tr><td>Lecture 5</td><td>If statement
<table>
<tr><td> 
</td><td>Write C++ program to read three numbers and print the largest one.</td><td>Write C++ program to read student degree and print the student appreciation(Excellent, Very Good ,Good,…)</td></tr>
</table></td></tr>
<tr><td>Lecture 6</td><td>If Else statement
<table>
<tr><td>int time = 20;
if (time < 18) {
cout << "Good day.";
} else {
cout << "Good evening.";
}
// Outputs "Good evening.</td><td>To check if a number is odd or even
include <iostream.h>
Void main()
{ int a;
Cin >>a;
If (a % 2 ==0)
{ cout << “ a is even” << endl;}
Else
{ cout << “ a is odd” << endl;}
}</td></tr>
</table></td></tr>
<tr><td>Lecture 7</td><td>Nested If Else
<table>
<tr><td>int time = 22;
if (time < 10) {
cout << "Good morning.";
} else if (time < 20) {
cout << "Good day.";
} else {
cout << "Good evening.";
}
// Outputs "Good evening."</td><td>Write a program to check whether a number is positive , negative or zero
#include<iostream.h>
int main() {
int num;
cout <<”Enter the number :”;
cin>> num:
if (num>0)
{ out<<”The number “<<num<<”is positive”<<endl;
}
elseif (num<0)
{ out<<”The number “<<num<<”is negative”<<endl;
}
else {cout <<”You entered zero”

cout <<” Thank you “;
}</td></tr>
</table></td></tr>
</table>

Programming Fundamentals
First class // First course

Lecture 8

Switch statement

C++ program to read integer number and print the coresponding week day.

```
#include<iostream.h>
void main( )
{
        int day;
        cout << "Enter the number of the day \n";
        cin >> day;
        switch (day)
{
   case 1:  cout << "Sunday";       break;
   case 2:  cout << "Monday";       break;
   case 3:  cout << "Tuesday";      break;
   case 4:  cout << "Wednesday";    break;
   case 5:  cout << "Thursday";     break;
   case 6:  cout << "Friday";       break;
   case 7:  cout << "Saturday";     break;
   default: cout << "Invalid day number";   break;
}
}
```

C++ program to read two numbers and arithmetic operation to perform it and find the result

```
#include <iostream.h>
Void main()
{ int a,b;
char op;
cin >> a >> b >> op;
switch (op)
{case '+':cout<<a+b;
          Break;
case '-':cout<<a-b;
          Break;
case '*':cout<<a*b;
          Break;
case '/':cout<<a/b;
          Break;
default: break;
}
}
```

Nested Switch

Write C++ program to read an integer number and print the corresponding department name and branch name

```
void main() {
    int i,j;
    cout << "Enter the number for the department name \n";
    cin >> i>>j;
    switch (i) {
    case  1:    cout << "Software Engineering Department"; break;
     case  2:   cout << "Control and computers Department"; break;
    case 3:     cout << "Computer Sciences Department";
                cout<<"Enter the no. of branch";
    switch(j) {
              case  1:          cout << "Software";  break;
              case  2:          cout << "Information system"; break;
              case 3:           cout << "Security";
              case 4:           cout << "AI";
    }
    default:   cout << "Invalid number";
        break; }
    }
```

Programming Fundamentals
First class // First course

<table>
<tr><td>Lecture 9</td><td>Order Evaluation

Write C++ program for the following equation
Z = P * R % Q + W / X – Y;

Write C++ program for the following equation
$f = \sqrt{\frac{\sin(x) - x^5}{\ln(x) + \frac{x}{4}}}$</td></tr>
<tr><td>Lecture 10</td><td>While statement

<table>
<tr><td>i = 0;
while (i < 10)
{
cout << i;
i ++;
Output:
0 1 0 1 2 3 4 5 6 7 8 9</td><td>i= 0;
while (i < 10)
cout << i;
i += 2;
}
Output: even numbers only
{ 0 2 4 6 8</td><td>Write C++ program to find the summation of the following series:
sum = 1 + 3 + 5 + 7 + … + 99
#include<iostream.h> void main( )
{
int count = 1; int sum = 0;
while (count <= 99)
{
sum = sum + count;
count = count + 2;
}
cout << "sum is: " << sum << endl;
}</td></tr>
</table>
</td></tr>
<tr><td>Lecture 11</td><td>While statement (continue)
<table>
<tr><td>C++ program to find the following series
$\sum_{i=1}^{n} i^n$</td><td>Write C++ program to find the summation of student's marks, and
it's average, assume the student have 8 marks:
#include<iostream.h>
void main( )
{
int mark, i, sum = 0;
float av = 0;
i = 1;
while (i <= 8)
{
cout << "enter mark: ";
cin >> mark;
sum = sum + mark; i++;
}
cout << "sum is: " << sum << endl; av = sum / 8;
cout << "average is: " << av;}</td></tr>
</table>
</td></tr>
</table>

Programming Fundamentals
First class // First course

Lecture 12	**For Statement**
	
	Example1:Write C++ program using For to print the even numbers between 2 and 10
	`for ( i = 0; i < 10; i += 2 )`
	`cout << i;`
	
	Example 2 :Write C++ program to find the factorial on N! using For Statement
	`void main( )`
	`{`
	`int n, f = 1;`
	`cout << "enter positive number: ";`
	`cin >> n;`
	`for ( int i = 2; i <= n; i ++ )` ⟷ `for ( int i = n; i > 2; i -- )`
	`f = f * i;`
	`cout << "factorial is: " << f;`
	`}`