# Exercise: Conditional constructions

Exercises to the ["Basics of Programming" course @ SoftUni](https://softuni.bg/courses/programming-basics) .

Test your decisions in the **judge** **system**: [https://judge. softuni. bg/Contests/2390](https://judge.softuni.bg/Contests/2390)

## 1. Sum seconds

Three athletes finish in a number **of seconds** (between **1** and **50**). Write a program that reads the times of the contestants in secondsentered by the user and **calculates their total time** in the format "minutes:seconds". Seconds to be led by a **leading zero** (2  "02", 7  "07", 35  "35").

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |
| 35  45  44 | 2:04 | 22  7  34 | 1:03 | 50  50  49 | 2:29 | 14  12  10 | 0:36 |

### Guidelines:

1. Read the input data **(seconds of the contestants)** ):

2. Create a **new**variable to store the sum of the **three contestants' seconds:**

3. After you have found the sum of seconds **you** need to **turn them into minutes and seconds** (for example, if the sum is **85 seconds it is 1 minute and 25 seconds, because 1 minute has 60 seconds**). Create two new **variables**. In the first, calculate how many minutes is the sum of seconds by dividing the sum **by 60.**In the second variable, calculate the seconds using a division **with a residue (%)**. Use a division with a residue (%) to take a balance **(%)**to take a balance. **For example,**you have a total of 134 seconds (2 minutes and 14 seconds) after the integer **division (/) of 60, we will get 2 and remainder 14, which we will** take with the division with a remnant (%).

4. Now that you know how many minutes and seconds the total is, we need to print them in the correct format **(minutes :**seconds), and if the seconds are less than **10** we need to print **0 before the** seconds, otherwise we just print the result in the given format..

**\*** **Printing the result with a leading zero can also be done using the template %02d,**through which we can**show that we want our integer (seconds) to consist of two digits:**

## 2. Bonus Points

An **integer is given** - an initial number of points. Bonus points are charged **according to** therules describedbelow. Write a program that calculates the bonus **points, the number and total points** receive(number + bonus)).

         If the number is **up to 100 inclusive,** the bonus points are **5**.

         If the number **is greater than 100,**the bonus points are **20%** of the number.

         If the number is **greater than 1000,**bonus points are **10%** of the number.

         Additional bonus points (charged separately from the previous ones):

o For even **number**  + 1 t.

o For a number that ends at **5**  + 2 t.

### Examples:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |
| 20 | 6.0  26.0 | 175 | 37.0  212.0 | 2703 | 270.3  2973.3 | 15875 | 1589.5  17464.5 |

### Guidelines:

1. Read the input data **(the number** ):

2. Create a new **double** **variable** in which you will calculate your **accumulated bonus points**by giving it a starting value of **0**.

3. Do **if-else-** **if** construction for the **first**three checks to check the size of the number and calculate the bonus.

4. Make a new **if-else-if** construction to perform the checks and calculate the additional bonus. If the number is even to date the accumulated bonus add 1, and if it ends at 5 to the bonus add 2. To check if a number is even you need to divide it into 2 and if you receive a balance in division 0, then the number iseven, but if you get a **remainder 1,**it means for **example, the** number 34 is even because 34/2 = 17 and the remainder is 0 and the number 35 is odd, because 35 /2 = 17 with remainder 1.

5. Print the results in two **rows.**

## 3. Speed information

Write a program that **reades speed** ( **(number) entered**by the user and prints speed **information.** At speeds **of up** to **10** (including) print "**slow**". At speeds **above 10** and up **to 50,** print "**average**". At speeds **above 50** and up **to 150,** print **"fast".** At speeds **above 150** and up **to 1000,** print **"ultra fast".** At higherspeed, print "extremely **fast".** Examples:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |
| 8 | slow | 49.5 | Average | 126 | fast | 160 | ultra fast | 3500 | extremely fast |

### Guidelines:

1. Read the input data **(speed** ):

2. Use if-else- if construction to check speed **values.**

## 4. Unit converter

Write a program that converts distance **between** the following **3 units of measurement:** mm, , m. Use the matches in the tablebelow:

|  |  |
| --- | --- |
| **input unit** | **output unit** |
| **1** meter (**m**) | **1000** millimeters (**mm**) |
| **1** meter (**m**) | **100** centimeters (**cm**) |

Input data consists of three lines enteredby the user:

         **First row:** conversion number - real **number**

         **Second row:** input unit of measure - **text**

         **Third row:** output unit of measure (for result) - **text**

On the console to **print the result of the conversion** of the units of measurement **formatted** **to three decimal places**.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |
| 12  Mm  M | 0.012 | 150  M  Cm | 15000.000 | 45  Cm  Mm | 450.000 |

## 5. Time + 15 minutes

Write a program thatreads an hour and **minutes** of 24-hour days entered by the user and calculates what **time it will be in 15 minutes**. Print the result in hours :minutesformat. The hours are always between 0 and 23, and the minutes are always between 0 and 59. The hours are written in one or two digits. Minutes are always written in two digits, with a leading **zero,** when necessary.

### Examples:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |  | **Login** | **Issue** |
| 1  46 | 2:01 | 0  01 | 0:16 | 23  59 | 0:14 | 11  08 | 11:23 | 12  49 | 13:04 |

# Sample exam tasks

## 6. Godzilla vs. Kong

Filming for the long-awaited film Godzilla vs. Kongis under way. The writer Adam Wingard asks you **to write a**programme to calculate whether **the funds provided are sufficient** to make the film. For the photos you will need **a certain number of statisticians,, for** each statistician and **décor** **.**

It isknown that:

         The décor for **the film is worth 10% of the budget.**

         With **more than 150 statisticians, there is a 10% discount on clothing.**

### Login

3 lines are read **from the console**:

**Row 1. Movie budget – real number in the interval [1.00 ... 1000000.00]**

**Row 2. Number of statisticians - integer in the interval [1 ... 500]**

**Row 3. Price for clothing of a statistician – real number in the interval [1.00 ... 1000.00]**

### Issue

Two lines must be printed on **the console**:

         If the money for the décor and **clothes is more than the budget**:

o "Not enough money! "

o "Wingard needs {the money scarce for the film} leva more."

         If the money for the décor and **clothes is less than or equal to the budget**:

o "Action!"

o "Wingard starts filming with {the rest of themoney} leva left. "

The result must be formatted to two decimal places.

### Sample input and output

|  |  |  |
| --- | --- | --- |
| **Login** | **Issue** | **Explanations** |
| 20000  120  55.5 | Action!  Wingard starts filming with 11340.00 leva left. | Decor amount: 10% from 20000 = 2000 LV.  Clothing amount: 120 \* 55.5 = 6660 BGN  Total for the film: 2000 + 6660 = 8660 BGN  20000 – 8660 = 11340 leva remain. |
| 15437.62  186  57.99 | Action!  Wingard starts filming with 4186.33 leva left. | Decor amount: 10% from 15437.62 = 1543.762 лв.  Clothing amount: 186 \* 57.99 = 10786.14 BGN  The statisticians are more than 150 therefore there is a 10% discount on clothing.  10% of 10786.14 was 1078.614  10786.14 – 1078.614 = 9707.526 BGN for clothing  Total for the film: 1543.762 + 9707.526 = 11251.288  15437.62 – 11251.288 = 4186.331 leva remain |
| 9587.88  222  55.68 | Not enough money!  Wingard needs 2495.77 leva more. | Decor amount: 10% from 9587.88 = 958.788 лв.  Clothing amount: 11124.864 BGN  Total for the film: 958.788 + 11124.864 = 12083.652  9587.88 – 12083.652 = 2495.77 BGN fell short |

## 7. World Swimming Record

Ivan decided to improve the World Record for long-distance swimming. **The console sets the recordin seconds that** Ivan needs to improve **,** the distance in metres to swim **,** and the time in seconds **for which** he **swims a distance of 1** m . **Write** a programme thatcalculates whether he has handled the task ,given that: water resistance **slows him down every 15 m.** **12.5 seconds.** When calculating how many times Ivan will slowdown as a result of water resistance, the result should be rounded down **to thenearestinteger.**

**Calculate the time in seconds for which Ivan will swim the distance and the difference relative to the World Record.**

### Login

3 lines are read **from the console**:

**1. The record in seconds – real number in the interval [0.00 ... 100000.00]**

**2. Distance in meters – real number in the interval [0.00 ... 100000.00]**

**3. The time in seconds for which swims a distance of 1 m. - real number in the interval [0.00 ...** **1000.00]**

### Issue

Printing the console depends on the result:

* If **Ivan has improved the World Record (his time is less than the record)** we print:
  + **"Yes, he succeeded! The new world record is {Ivan's time**}**seconds."**
* If **he has NOT improved the record (his time is greater than or equal to the record)** we print:
  + **"No, he failed! It was {**the seconds that are**notthere } seconds slower."**

**The result must be formatted to two decimal places**.

### Sample input and output

|  |  |  |
| --- | --- | --- |
| **Login** | **Issue** | **Explanations** |
| 10464  1500  20 | No, he failed! He was 20786.00 seconds slower. | **Ivan must swim 1500 m.: 1500 \* 20 = 30000 sec .**  **Every 15 m. to its time are added 12.5 sec.:**  **1500 / 15 = 100 \* 12.5 = 1250 sec.**  **Total time: 30000 + 1250 = 31250 sec.**  **10464 < 31250**  **The time he didn't have to improve the record:**  **31250 – 10464 = 20786 sec .** |
| **Login** | **Issue** | **Explanations** |
| 55555.67  3017  5.03 | Yes, he succeeded! The new world record is 17688.01 seconds. | **Ivan must swim 3017 m.: 3017 \* 5.03 = 15175.51 sec .**  **Every 15 m. to its time are added 12.5 sec.:**  **3017/ 15 = 201 \* 12.5 = 2512.50 sec.**  **Total time: 15175.51 + 2512.50 = 17688.01 sec.**  **Record improved: 55555.67 > 17688.01** |

## 8. \*Scholarships

Students can apply for a **social scholarship** or an excellent **success scholarship.** Social scholarship requirement - **income per family member less thanthe**minimum wage and success above**4.5** . Amount of social scholarship - **35% of** the minimum **wage**. Scholarship requirement for excellent success - success **over 5.5, including**. Amount of scholarship for excellent success - the success of the **student, multiplied by a factor of 25**.

Write a program that, with income **in place**- **success** **and** **minimum** **wage**- provides information on whether a student is eligible to receive a scholarship and the value of the scholarship that is **higher** for them.

### Login

The user **enters 3**numbers, one per line:

**1. Income in BGN** - real number in the interval **[0.00..6000.00]**

**2.** Average success - **real number in the interval [2.00...6.00]**

**3.** Minimum wage - real number in the interval **[0.00..1000.00]**

### Issue

         If the student **is not entitled to receive a scholarship,** the:

**"You cannot get a scholarship!"**

         If the student **is entitled to receive a social** scholarship and it is higher **than** the scholarship for excellent success:  
**" You get a Social Scholarship {Scholarship Value}** BGN **"**

         If the student **is entitled to receive an excellent success** scholarship and it is higher **or** **equal in** value of the social scholarship for him or her:

         **"You get a scholarship for excellent results {**scholarship**value**}**BGN"**

**The result is rounded to the smaller integer.**

### Sample input and output

|  |  |  |
| --- | --- | --- |
| **Login** | **Issue** | **Explanations** |
| 480.00  4.60  450.00 | You cannot get a scholarship! | The income of BGN 480 is higherthan the minimum wage 450 BGN. → student cannot receive a social scholarship.  Success 4.60 < 5.50 → the student can not receive a scholarship for excellent success. |
| 300.00  5.65  420.00 | You get a Social scholarship 147 BGN | 300 BGN < 420 BGN and 5.65 >4.50 → the student can receive a social scholarship 35% \* 420 LV. = 147 LV.  Success 5.65 > 5.50 → the student can receive a scholarship for excellent success 5.65 \* 25 = 141.25 lv.  BGN 147 > 141.25 BGN → student will receive a social scholarship. |