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Assignment 4: IOAA Document

**Data Input**

|  |  |  |
| --- | --- | --- |
| Variable name | C++ Data Type | Remarks/Comments |
| nameFirst | string | First name |
| nameLast | string | Last name |
| codeEmployee | char | Employee code (S, O, or M),  only allow to use upper cases |
| ID | int | User ID |
| codeJob | int | Job classification (1, 2, or 3) |
| serviceYear | int | Years of service, only allow to use less than 50 years |
| codeEducation | int | Educational code (1, 2, 3, or 4) |

**Data Output**

|  |  |  |
| --- | --- | --- |
| Variable name | C++ Data Type | Remarks/Comments |
| nameUser | string | nameUser = nameFirst + name Last |
| ID | int | User ID |
| nameEmployee | string | Print employee description depending on codeEmployee |
| salary | double | Total calculated salary |

**Computational Aid and Other Variables**

|  |  |  |
| --- | --- | --- |
| Variable name | C++ Data Type | Remarks/Comments |
| salaryBase | double | Refer to the Table 1 |
| incJob | double | Refer to the Table 2 |
| incYear | double | Refer to the Years of Service |
| incEdu | double | Refer to the Table 3 |
| flagEmp | bool | flag for codeEmployee |
| flagJob | bool | flag for codeJob |
| flagYear | bool | flag for serviceYear |
| flagEdu | bool | flag for codeEducation |

Table 1: Base Pay for various Employee Codes

|  |  |  |
| --- | --- | --- |
| Employee Description | Base Pay in Dollars | Employee Code |
| Factory Worker | 800.95 | S |
| Office Worker | 1000.86 | O |
| Management | 1499.89 | M |

\* Table 2: Additions to base pay due to Job Classification

|  |  |
| --- | --- |
| Job Classification | Percentage of base pay to add to calculate gross pay |
| 1 | 5% |
| 2 | 10% |
| 3 | 20% |

\* Table 3: Addition to salary due to educational code

|  |  |  |
| --- | --- | --- |
| Educational Code | Level of Education | Percentage of base pay to add to calculate the gross pay |
| 1 | High School | 0% |
| 2 | Junior College | 5% |
| 3 | University | 12% |
| 4 | Graduate School | 20% |

**Analysis**

**\* Base Pay for various Employee Codes**

If (codeEmployee == ‘S’) then

salaryBase = 800.95

nameEmployee = “Factory Worker”

Else if (codeEmployee == ‘O’) then

salaryBase = 1000.86

nameEmployee = “Office Worker”

Else if (codeEmployee == ‘M’) then

salaryBase = 1499.89

nameEmployee = “Management”

Else

Print, “Employee code is invalid.”, EOL

set boolean flag for codeEmployee as bool flagEmp = false

End if

**\* Additions to base pay due to Job Classification**

If (codeJob == 1) then

incJob = salaryBase \* 0.05

Else if (codeJob == 2) then

incJob = salaryBase \* 0.1

Else if (codeJob == 3) then

incJob = salaryBase \* 0.2

Else

Print, “Job Classification is invalid.”, EOL

set boolean flag for codeJob as bool flagJob = false

End if

**\* Additionss to salary due to Years of Service**

If (serviceYear >= 0 and serviceYear <= 10) then

incYear = salaryBase \* 0.05

Else if (serviceYear > 10 and serviceYear <= 50) then

incYear = (salaryBase \* 0.05) + (salaryBase \* 0.01 \* (serviceYear – 10))

Else

Print, “Years of service is invalid.”, EOL

set boolean flag for serviceYear as bool flagYear = false

End if

**\* Additions to salary due to educational code**

If (codeEducation == 1) then

incEdu = 0

Else if (codeEducation == 2) then

incEdu = salaryBase \* 0.05

Else if (codeEducation == 3) then

incEdu = salaryBase \* 0.12

Else if (codeEducation == 4) then

incEdu = salaryBase \* 0.2

Else

Print, “Education code is invalid.”, EOL

set boolean flag for codeEducation as bool flagEdu = false

End if

**\* Calculation of Gross Salary**

If (flagEmp && flagJob && flagYear && flagEdu) then

salary = salaryBase + incJob + incYear + incEdu

nameUser = nameFirst + nameLast

Print, nameUser, ID, nameEmployee, salary, EOL

End if

**Algorithm**

1. Add all the #include directives, declare global constants
2. declare nameFirst as string
3. declare nameLast as string
4. declare nameEmployee as string
5. declare codeEmployee as char
6. declare ID as int
7. declare codeJob as int
8. declare serviceYear as int
9. declare codeEducation as int
10. declare flagEmp as bool
11. declare flagJob as bool
12. declare flagYear as bool
13. declare flagEdu as bool
14. declare salaryBase as double
15. declare incJob as double
16. declare incYear as double
17. declare incEdu as double
18. Print greeting message and explain input
19. prompt user for values nameFirst, nameLast, codeEmployee, ID, codeJob, serviceYear, codeEducation
20. get and store input into variable nameFirst, nameLast, codeEmployee, ID, codeJob, serviceYear, codeEducation
21. If (codeEmployee == ‘S’) then
    1. salaryBase = 800.95
    2. nameEmployee = “Factory Worker”
22. Else if (codeEmployee == ‘O’) then
    1. salaryBase = 1000.86
    2. nameEmployee = “Office Worker”
23. Else if (codeEmployee == ‘M’) then
    1. salaryBase = 1499.89
    2. nameEmployee = “Management”
24. Else
    1. Print, “Employee code is invalid.”, EOL
    2. set boolean flag for codeEmployee as bool flagEmp = false
25. End if
26. If (codeJob == 1) then
    1. incJob = salaryBase \* 0.05
27. Else if (codeJob == 2) then
    1. incJob = salaryBase \* 0.1
28. Else if (codeJob == 3) then
    1. incJob = salaryBase \* 0.2
29. Else
    1. Print, “Job Classification is invalid.”, EOL
    2. set boolean flag for codeJob as bool flagJob = false
30. End if
31. If (serviceYear >= 0 and serviceYear <= 10) then
    1. incYear = salaryBase \* 0.05
32. Else if (serviceYear > 10 and serviceYear <= 50) then
    1. incYear = (salaryBase \* 0.05) + (salaryBase \* 0.01 \* (serviceYear – 10))
33. Else
    1. Print, “Years of service is invalid.”, EOL
    2. set boolean flag for serviceYear as bool flagYear = false
34. End if
35. If (codeEducation == 1) then
    1. incEdu = 0
36. Else if (codeEducation == 2) then
    1. incEdu = salaryBase \* 0.05
37. Else if (codeEducation == 3) then
    1. incEdu = salaryBase \* 0.12
38. Else if (codeEducation == 4) then
    1. incEdu = salaryBase \* 0.2
39. Else
    1. Print, “Education code is invalid.”, EOL
    2. set boolean flag for codeEducation as bool flagEdu = false
40. End if
41. If (flagEmp && flagJob && flagYear && flagEdu) then
    1. declare salary as double
    2. salary = salaryBase + incJob + incYear + incEdu
    3. declare nameUser as string
    4. nameUser = nameFirst + nameLast
    5. Set outputted formatted to two decimal places
    6. Print, nameUser, ID, nameEmployee, salary, EOL
42. End if