

Advanced python programming Exam**Exam solution****Exercise 01:** Give the output of the following Python commands: (6 pt)

1. int (0,5)	2. str (0,5)	3. 55 (0,5)	4. dict (0,5)
5. float (0,5)	6. list (0,5)	7. 12.3 (0,5)	8. 7 (0,5)
9. str (0,5)	10. bool (0,5)	11. complex (0,5)	12. tuple (0,5)

Exercise 02: Consider the following Python function: (5 pt)

- Input => n (0,5)
Output => result (0,5)
- Compute(4) (0,5)
- n=-2 => Input must be a positive number. (0,5)
n=0 => 1 (0,5)
n=1 => 1 (0,5)
n=5 => 120 (0,5)
- i = 1 (0,5)
while i < n + 1: (0,5)
 result = result * i
 i = i + 1 (0,5)
return result

Exercise 03: (4 pt)

1.

Public	Protected	Private
self.name (0,25) self.sector (0,25) def get_public_profile() (0,25) def get_total_salary() (0,25)	self._base_salary (0,25) def _calculate_base_pay() (0,25)	self.__tax_id (0,25) def __log_id_access() (0,25)

- BaseWorker => Base (Parent) class (0,5)
Manager => Derived (Child) class (0,5)
- manager => object (instance) (0,5)
- manager._BaseWorker__tax_id
manager._BaseWorker__log_id_access() } (0,5)

Exercise 04: Choose the correct answer for each case: (5 pt)

1. Which library is used for statistical data analysis?	2. Which library is used to load data from an excel file
import seaborn	import numpy
import numpy (1,25)	✗ import sklearn.datasets import load_iris
import matplotlib	import pandas (1,25) ✗
3. Which library is used for raw data to data frame?	4. Which library is used to create interactive graphs?
import pandas (1,25)	✗ import matplotlib
from sklearn. preprocessing import DataFrame	import plotly (1,25) ✗
import csv	import seaborn



Suggestion de solution de l'examen final

Programming C++ Embadded

Exercice 01 : 05 points

```
#include <iostream>
using namespace std;
int main() {
    double tensions[12];
    double somme = 0.0;
    int compteur = 0;
    const double seuil = 11.5;
    // Saisie des tensions
    for (int i = 0; i < 12; i++) {
        cout << "Entrer la tension de l'heure " << i + 1 << " : ";
        cin >> tensions[i];
        somme += tensions[i];
        if (tensions[i] < seuil) {
            compteur++;
        }
    }
    // Calcul et affichage
    double moyenne = somme / 12.0;
    cout << "Tension moyenne : " << moyenne << " V" << endl;
    cout << "Nombre de mesures inferieures a 11.5 V : " << compteur << endl;
    return 0; }
```

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Exercice 02 : 07 points

```
#include <iostream>
#include <iomanip>
using namespace std;
double calibrateSensor(double x, double y) { return x + y; }

int main() {
    double distances[3];
    double offset;
    for (int i = 0; i < 3; i++) {
        cout << "Entrer la distance du capteur " << i + 1 << " : ";
        cin >> distances[i];
    }
    cout << "Entrer la valeur de l'offset de calibration : ";
    cin >> offset;

    for (int i = 0; i < 3; i++) { distances[i] = calibrateSensor(distances[i], offset); }
    cout << fixed << setprecision(2);
    cout << "Distances corrigées : " << endl;
    for (int i = 0; i < 3; i++) {
        cout << "Capteur " << i + 1 << " : " << distances[i] << " m" << endl;
    }
    return 0; }
```

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Exercice 03 : 08 points

```
#include <iostream>
#include <string>
#include <iomanip> // Pour setprecision
using namespace std;
struct Composant { // Définition de la structure
    string reference;
    int quantite;
    double prixUnitaire;
};

int main() {
    const int Taille = 2;
    Composant inventaire[Taille];
    for (int i = 0; i < Taille; i++) {
        cout << "Saisie du composant " << i + 1 << " : " << endl;
        cout << " Reference : "; cin >> inventaire[i].reference;
        cout << " Quantite : "; cin >> inventaire[i].quantite;
        cout << " Prix Unit : "; cin >> inventaire[i].prixUnitaire;
        cout << "-----" << endl;
    }
    cout << "\n--- ETAT DU STOCK ---" << endl;
    for (int i = 0; i < Taille; i++) {
        cout << "Ref: " << inventaire[i].reference << " | Qte: " << inventaire[i].quantite;
        if (inventaire[i].quantite < 10) { cout << " -> REAPPROVISIONNEMENT NECESSAIRE"; }
        cout << endl;
    }
    double total = 0;
    for (int i = 0; i < Taille; i++) {
        total += inventaire[i].quantite * inventaire[i].prixUnitaire;
    }
    cout << "\nValeur totale du stock : " << fixed << setprecision(2) << total << " DA" << endl;
    string refRecherchee;
    bool trouve = false;
    cout << "\nEntrez la reference a rechercher : ";
    cin >> refRecherchee;
    for (int i = 0; i < Taille; i++) {
        if (inventaire[i].reference == refRecherchee) {
            cout << "Resultat : Le composant " << refRecherchee << " a une quantite de "
                << inventaire[i].quantite << " en stock." << endl;
            trouve = true;
            break; /* Sortie de boucle dès que trouvé */
        }
    }
    if (!trouve) { cout << "Message : Composant introuvable." << endl; }
    return 0; }
```

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