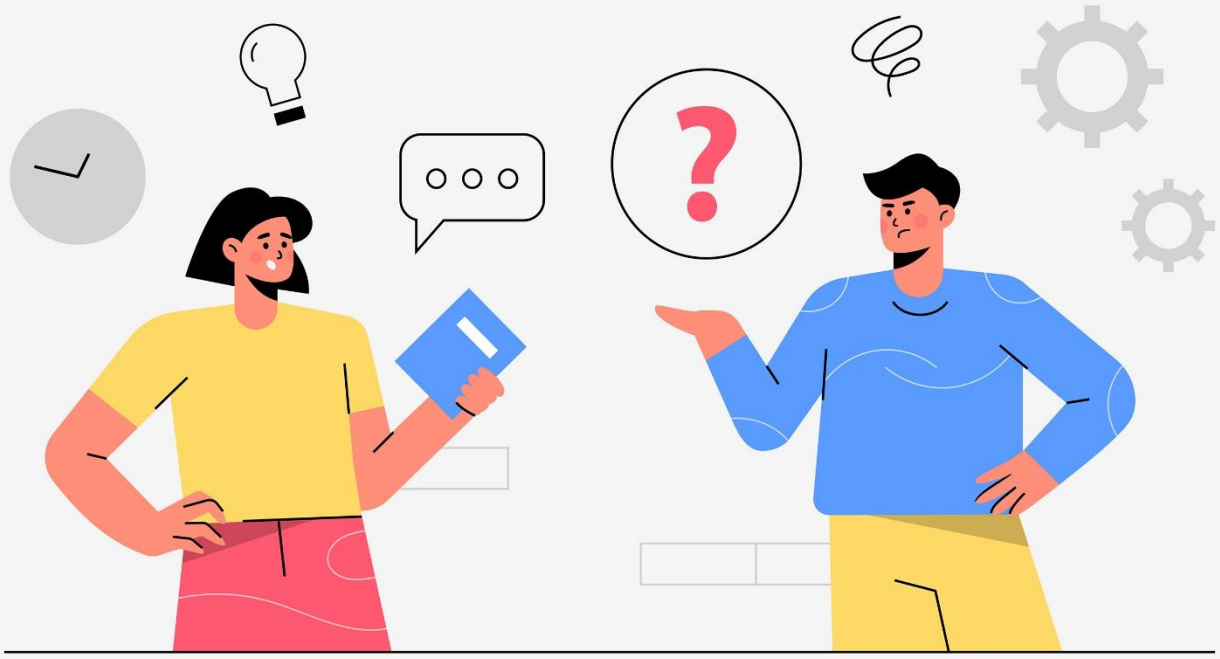
پاسخ سوال برنامه‌نویسی

دوره استادی پایتون درسمن

پایتون پیشرفته



پاسخ تمرین شماره ۱:

```python
### program for player selection process for team sport (step 1)
# ------------------------------------------------------------------------------
# class for handling errors in program
class My_Exception_Handling (Exception):
    def __init__(self,message):
        super().__init__(message)
        self.message = message

    def __str__(self):
        return "Error:"+self.message
# ------------------------------------------------------------------------------
### initial selection based on age, weight, and height
class Player_Selection:
    def __init__(self, player_Code, age, weight, height):
      self.player_Code = player_Code
      self.age = age            #user input
      self.weight = weight      #user input
      self.height = height      #user input
    # ==========================================================================
    ### type checking
    @staticmethod
    def check_integer(number):
        try:
            int(number)
            return True
        except:
            return False

    @staticmethod
    def check_float(number):
        try:
          float(number)
          return True
        except:
          return False
    # ==========================================================================
    ### conditions for age and weight ----> 15 - 25 yeras old: 60 - 80 kg , 25 - 35 yeras old: 50 - 75 kg
    ### condition for height ----> 170 - 190 cm
    def weight_Validation(self):
        if not Player_Selection.check_integer(self.age):
                raise My_Exception_Handling("Age is not valid\n**********************")
        if not 15<= int(self.age) <= 35:
                raise My_Exception_Handling("Age out of range\nThis person is not allowed to register...\n**********************")
        else:
            if  15<= int(self.age) < 25:
                if not Player_Selection.check_float(self.weight):
                    raise My_Exception_Handling("Weight is not valid\n**********************")
                if not 60.00 <= float(self.weight) <= 80.00:
                    raise My_Exception_Handling("Weight out of range\nThis person is not allowed to register...\n**********************")
                return self.weight
            elif 25 <= int(self.age) <= 35:
                if not Player_Selection.check_float(self.weight):
                    raise My_Exception_Handling("Weight is not valid\n**********************")
                if not 50.00 <= float(self.weight) <= 75.00:
                    raise My_Exception_Handling("Weight out of range\nThis person is not allowed to register...\n**********************")
                return self.weight
```

```python
    # ================================================================================
    def height_Validation(self):
        if not Player_Selection.check_integer(self.height):
            raise My_Exception_Handling("Height is not
            valid\n**********************")
        if not 170 <= int(self.height) <= 190:
            raise My_Exception_Handling("Height out of range\nThis person is not allowed to register...
            \n**********************")
        return self.height
    # ================================================================================
    def register_Player(self):
        try:
            self.weight_Validation()
            self.height_Validation()
            return f"Code:{self.player_Code}\tAge:{self.age}Years Old\tWeight:{weight}Kg\tHeight:
            {height}Cm"
        except My_Exception_Handling as error:
            print(error)
# ------------------------------------------------------------------------------------------------------------
# ------------------------------------------ main program ----------------------------------------------------
player_List = []
while True:
    code = input("Enter Code: ")
    if code != "0":
        age = input("Enter Age: ")
        weight = input("Enter Weight: ")
        height = input("Enter Height: ")
        print("**********************")
        player = Player_Selection(code,age,weight,height)
        player_List.append(player.register_Player())
    else:
        break

print("**********************")
print("The list of registered people:")
for player in player_List:
    if player != None:
        print(player)
# ------------------------------------------ output ----------------------------------------------
```

```
Enter Code: 1
Enter Age: 23
Enter Weight: 60
Enter Height: 176
**********
Enter Code: 2
Enter Age: 45
Enter Weight: 55
Enter Height: 178
**********
Error:Age out of range
This person is not allowed to register...
**********
Enter Code: 3
Enter Age: 30
Enter Weight: 56
Enter Height: 192
**********
Error:Height out of range
This person is not allowed to register...
**********
Enter Code: 4
Enter Age: 29
Enter Weight: 50
Enter Height: 188
**********
Enter Code: 5
Enter Age: 33
Enter Weight: 82
Enter Height: 174
**********
Error:Weight out of range
This person is not allowed to register...
**********
Enter Code: 6
Enter Age: 25
Enter Weight: 6t2
Enter Height: 181
**********
Error:Weight is not valid
**********
Enter Code: 6
Enter Age: 25
Enter Weight: 62
Enter Height: 181
**********
Enter Code: 7
Enter Age: 34
Enter Weight: 55
Enter Height: r190
**********
Error:Height is not valid
**********
Enter Code: 7
Enter Age: 34
Enter Weight: 55
Enter Height: 190
**********
Enter Code: 0
**********
The list of registered people:
Code:1  Age:23Years Old Weight:60Kg     Height:176Cm
Code:4  Age:29Years Old Weight:50Kg     Height:188Cm
Code:6  Age:25Years Old Weight:62Kg     Height:181Cm
Code:7  Age:34Years Old Weight:55Kg     Height:190Cm
```

پاسخ تمرین شماره ۲:

```python
### program for showing cities by population density
# ============================================================================
# examples
city_List = ["city1","city2","city3","city4","city5","city6"]
population_List = [300000,1000000,3800000,500000,1900000,100000]
area_List_squarekilometer = [100,200,500,150,300,100]
# ============================================================================
# 1 square kilometer = 100 hectare
def square_kilometer_to_hectare_conversion(area_List_squarekilometer):
    area_List_hectare = [area*100 for area in area_List_squarekilometer]
    return area_List_hectare
# ============================================================================
# density formula = population / area(hectare)
def density_Calculation(population_List):
    density_List = []
    for i in range(6):
        density = int(population_List[i]/square_kilometer_to_hectare_conversion
        (area_List_squarekilometer)[i])
        density_List.append(density)
    return density_List
# ============================================================================
def show_City_Density(city_List):
    city_Density_Dict = {city:density for city,density in zip(city_List,density_Calculation
    (population_List))}
    print("List of cities by population density")
    print("----------------------------")
    print("City\tDensity")
    for city,density in city_Density_Dict.items():
        print(city,"\t",density)
    print("****************************")
    print("List of high Density cities")
    print("----------------------------")
    print("City\tDensity")
    high_Density_cities_dict = {city:density for city,density in zip(city_List,density_Calculation
    (population_List)) if density >= 50}
    for city,density in high_Density_cities_dict.items():
        print(city,"\t",density)
# ============================================================================
# ---------------------------------- main program ----------------------------
show_City_Density(city_List)
# ------------------------------------------- output ---------------------------------------------
```

```
List of cities by population density
----------------------------
City    Density
city1    30
city2    50
city3    76
city4    33
city5    63
city6    10
****************************
List of high Density cities
----------------------------
City    Density
city2    50
city3    76
city5    63
```