C++语言作业

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虚函数

头文件：

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| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28  29 | /\* Shape.h \*/  #ifndef \_SHAPE\_H\_  #define \_SHAPE\_H\_  class Circle {  protected:  float radius;  public:  Circle(float);  virtual float area();  virtual float volume();  };  class Sphere: Circle {  public:  Sphere(float);  float area();  float volume();  };  class Column: Circle {  private:  float height;  public:  Column(float, float);  float area();  float volume();  };  #endif // Shape.h |

cpp文件：

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| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28 | /\* Shape.cpp \*/  #include "Shape.h"  #include <cmath>  Circle::Circle(float radius) {  Circle::radius = radius;  }  float Circle::area() {  return M\_PI \* radius \* radius;  }  float Circle::volume() { return 0; }  Sphere::Sphere(float radius) : Circle(radius) {}  float Sphere::area() {  return static\_cast<float>(4 \* M\_PI \* radius \* radius);  }  float Sphere::volume() {  return static\_cast<float>(4 / 3.0 \* M\_PI \* radius \* radius \* radius);  }  Column::Column(float radius, float height) : Circle(radius) {  Column::height = height;  }  float Column::area() {  return static\_cast<float>(2 \* M\_PI \* radius \* (radius + height));  }  float Column::volume() {  return static\_cast<float>(M\_PI \* radius \* radius \* height);  } |

教职工

头文件：

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| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  52  53  54  55 | /\* Shape.h \*/  #ifndef \_STAFF\_H\_  #define \_STAFF\_H\_  class Staff {  protected:  float basicSalary;  public:  Staff(float);  float getBasicSalary() const;  void setBasicSalary(float);  virtual float salary() const = 0;  };  enum title {  PROFESSOR = 50, // 教授  ASSOCIATE\_PROFESSOR = 30, // 副教授  LECTURER = 20 // 讲师  };  class Teacher: Staff {  private:  enum title title; // 职位  int classHour; // 课时  public:  Teacher(float, enum title, int);  enum title getTitle() const;  void setTitle(enum title);  int getClassHour() const;  void setClassHour(int);  float salary() const;  };  class Manager: Staff {  private:  float postSalary; // 职位工资  public:  Manager(float, float);  float getPostSalary() const;  void setPostSalary(float);  float salary() const;  };  class Lab: Staff {  private:  float dailySubsidy; // 日补贴  int workDayPerMonth; // 月工作日数  public:  Lab(float, float, int);  float getDailySubsidy() const;  void setDailySubsidy(float);  int getWorkDayPerMonth() const;  void setWorkDayPerMonth(int);  float salary() const;  };  #endif // Staff.h |

cpp文件：

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  52  53  54  55  56  57  58  59  60  61  62  63  64 | /\* Shape.cpp \*/  #include "Staff.h"  Staff::Staff(float basicSalary) {  Staff::basicSalary = basicSalary;  }  float Staff::getBasicSalary() const {  return basicSalary;  }  void Staff::setBasicSalary(float basicSalary) {  Staff::basicSalary = basicSalary;  }  Teacher::Teacher(float basicSalary, enum title title, int classHour) : Staff(basicSalary) {  Teacher::title = title;  Teacher::classHour = classHour;  }  enum title Teacher::getTitle() const {  return title;  }  void Teacher::setTitle(enum title title) {  Teacher::title = title;  }  int Teacher::getClassHour() const {  return classHour;  }  void Teacher::setClassHour(int classHour) {  Teacher::classHour = classHour;  }  float Teacher::salary() const {  return basicSalary + title \* classHour;  }  Manager::Manager(float basicSalary, float postSalary): Staff(basicSalary) {  Manager::postSalary = postSalary;  }  float Manager::getPostSalary() const {  return postSalary;  }  void Manager::setPostSalary(float postSalary) {  Manager::postSalary = postSalary;  }  float Manager::salary() const {  return basicSalary + postSalary;  }  Lab::Lab(float basicSalary, float dailySubsidy, int workDayPerMonth): Staff(basicSalary) {  Lab::dailySubsidy = dailySubsidy;  Lab::workDayPerMonth = workDayPerMonth;  }  float Lab::getDailySubsidy() const {  return dailySubsidy;  }  void Lab::setDailySubsidy(float dailySubsidy) {  Lab::dailySubsidy = dailySubsidy;  }  int Lab::getWorkDayPerMonth() const {  return workDayPerMonth;  }  void Lab::setWorkDayPerMonth(int workDayPerMonth) {  Lab::workDayPerMonth = workDayPerMonth;  }  float Lab::salary() const {  return basicSalary + dailySubsidy \* workDayPerMonth;  } |

测试代码：

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| 1  2  3  4  5  6  7  8  9  10  11  12  13 | /\* main.cpp \*/  #include <iostream>  #include "Staff.h"  using namespace std;  int main()  {  Teacher t(5500, LECTURER, 7);  cout << "教师的工资: " << t.salary() << endl;  Manager m(5000, 1000);  cout << "管理人员的工资: " << m.salary() << endl;  Lab l(4000, 60, 20);  cout << "实验室人员的工资: " << l.salary() << endl;  return 0;  } |